Glacial Drift;
nature notes from
Glacial National Park.

Vol. 2

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NATURE NOTES
FROM
GLACIER
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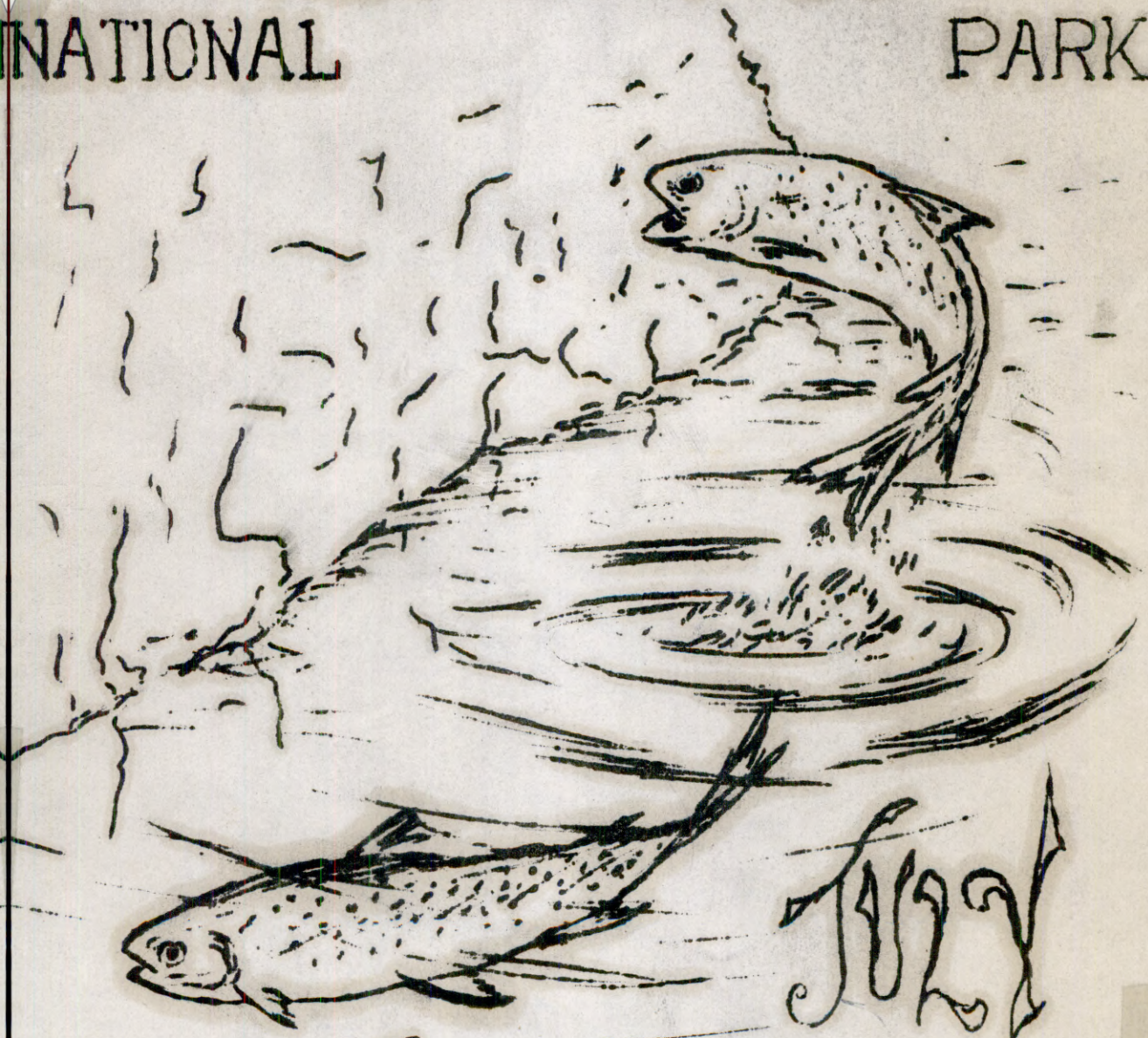

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UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
GLACIER NATIONAL PARK

NATURE NOTES FROM GLACIER NATIONAL PARK

Volume II July, 1929 Number 2

A monthly pamphlet edited by the park naturalist and distributed by the Educational Division of Glacier National Park to all interested in the park and its natural history.

J. Ross Eakin, Park Superintendent
Dr. C. C. Ruhle, Park Naturalist

"NATURE IS MORE THAN TRUTH,
IT IS BEAUTY AS WELL."

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JOHN MUIR
wrote: "Climb the mountains and get their good tidings; Nature's Peace will flow into you as sunshine flows into trees. The winds will blow into you their freshness, and the storms their energy, and cares will drop off like autumn leaves." (Chapter on Yellowstone Park in "Our National Parks.")

Mount Jackson - G.N.P.
Elev. 10,023 feet

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LAKE ISABEL TROUT

Clyde C. Fauley, Park Ranger

No matter how ravenous trout are naturally, some one is going to give them a coat of darker dye, especially those that inhabit Lake Isabel. I heard one yarn about a fisherman who fell from a log into this lake. The fish, hearing the loud splash, rushed up and, no doubt expecting some tempting morsels, attacked the fisherman. Another yarn credits the trout with nibbling the toes of a fisherman who had taken off his shoes and had waded to choice spots along the brushy shore. Such yarns are amusing, especially to their authors.

The worst things that Lake Isabel trout ever did to me, personally, fall far short of the above calamities, yet I have had quite enough experience with these fish to desire to continue the pleasure of further acquaintance. I have had as many as ten or fifteen trout rush at one fly, not little fingerlings, but trout measuring ten to twelve inches long. Perhaps the most peculiar thing about these trout is their total lack of fear of a fisherman; one's splashing along shore is the very thing that attracts them to a spot where one can cast a tempting fly. These trout have the choice habit of accepting almost any kind of bait and abount in such inveterate numbers that even the novice can easily secure the limit in a few minutes.

Being somewhat of a student of fresh-water biology, I have attempted to learn what these trout might find to eat in this lake which is at such high altitude. My sole equipment was a fifty-power microscope, through which I examined silt and algae from the lake bottom. It was amazing to find it teeming with ontomostraca and other aquatic life, some of it being so minute as to be quite invisible to the naked eye. I found cladocera or water fleas, fairy shrimp, and what I considered was a species of copepods. Here, then, is the reason for the dense fish population of Lake Isabel. The reproductive power of these crustaceans is remarkable. Fish-culturists have stated that the water fleas, or Daphnia, are capable of producing thirteen billion progeny in sixty days.

Lake Isabel is situated near the head of Park Creek, high in a beautiful cirque on the northeast slopes of Virgil Peak and Battlement Mountain. It remains ice-bound until the middle of May or first of June so trout must always have a short fly season. This is just the kind of a lake that fishermen dream about but very rarely see and is likely to remain so for a good many years, as it is far from hotels or other accommodations. Whoever makes the long trip will never forget the wild beauty of the place or the trout that are ever ready to accommodate the disciple of old Isaac Walton, whether that disciple be an expert fly fisherman or some young lad with willow fish pole trailing behind him.

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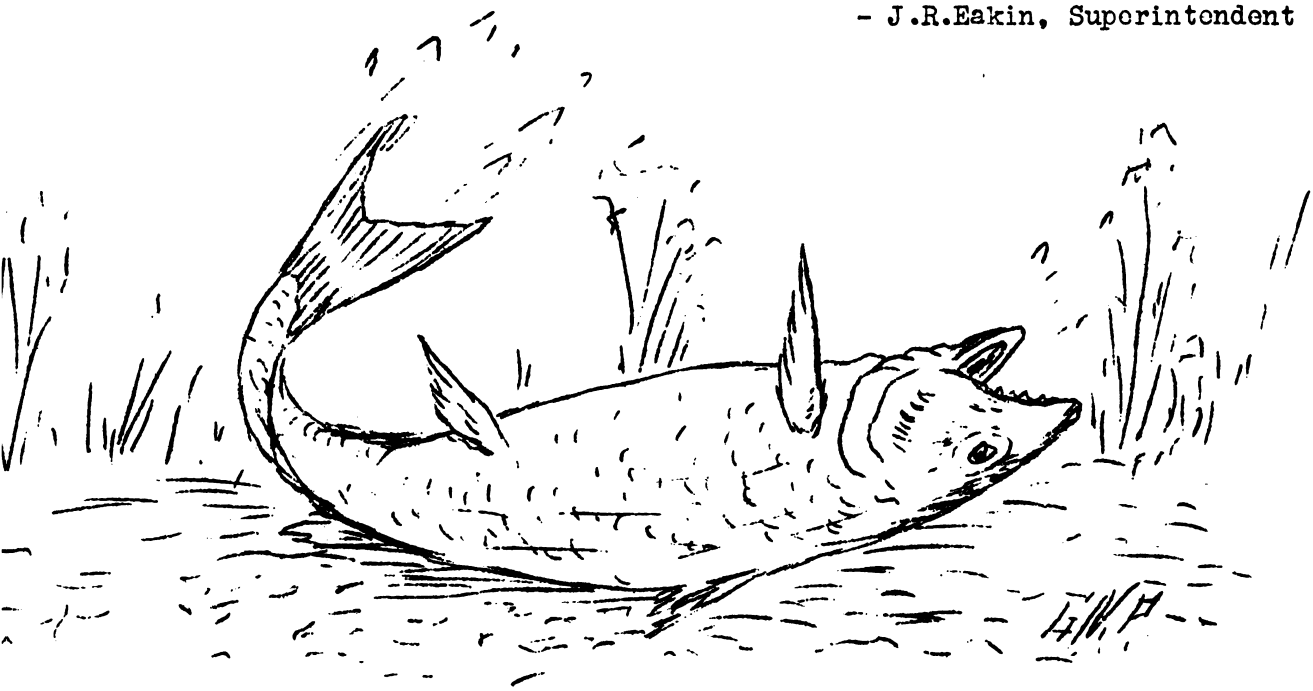
NOTE.- Entomostraca are one of the two sub-classes of the Crustacea, the great division of Invertebrate Animals that includes lobsters, crabs, shrimps, wood lice ("sow-bugs") and their allies. Entomostraca have comparatively simple organization and undergo metamorphosis during life, the larva leaving the egg as a nauplius, a free-swimming unsegmented body with three pairs of appendages and a median eye. Cladocera are a group of entomostraceans with leaf-like swimming "feet" (really antennae) that also serve as gills. Fairy shrimp have delicate colors, transparency, and graceful motions. Water fleas are so-called because they swim with sudden leaps or jerks. Typical copepods have distinctive body segments, four or five pairs of thoracic appendages, and limbless abdomens, the females have a pair of external pouches at the base of the abdomen in which they carry their eggs. Daphnia are a genus of the order Cladocera.

- G.C.R.-

Mink in Fish Trap - A very interesting thing happened at the Fish Creek fish traps a few weeks ago. It was noticed that some of the fish caught in the trap would later disappear. Ranger Lee, who had charge of the traps, was perplexed over the situation. One morning as he neared the trap he discovered a large trout flopping on the bank. Upon further investigation he discovered a medium-sized mink emerging from the trap carrying a trout almost as big as itself. In order to stop further depredations, a box trap was set and the mink caught within a few days. It was intended to release him after spawning season, and he seemed to be faring well in captivity, becoming quite a pet with the ranger, but one morning he was found dead in his cage. He was quite fond of live fish, always killing them by biting them through the spinal column just behind the head. He preferred to eat only the head. The mink has been skinned and its pelt acquired by the park naturalist for a future Glacier museum.

- J.R.Eakin, Superintendent



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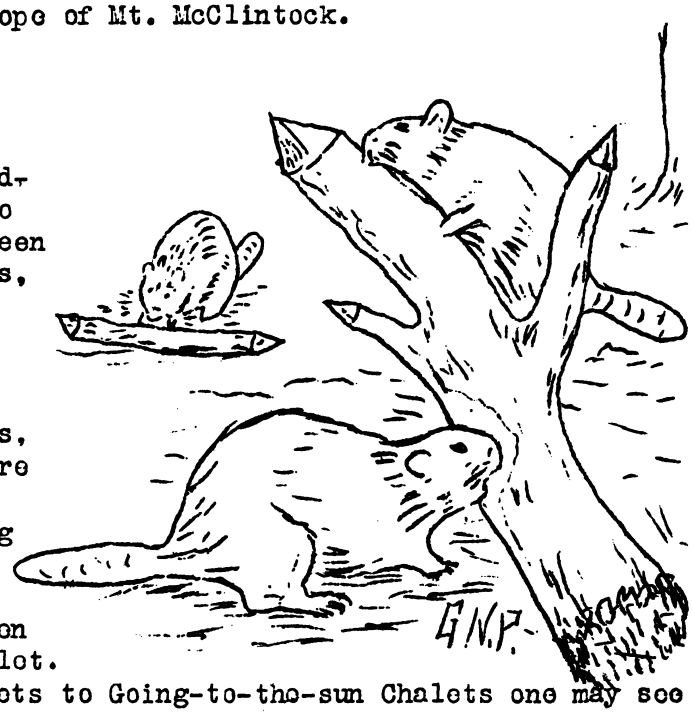
GLACIER PARK ANIMALS

WHERE THEY MAY BE SEEN BY THE PASSING TOURIST

Forrest L. Carter, Chief Ranger

Starting with what is known as the inside trail from Glacier Park station to Many Glacier, the following animals may be seen: mountain goat, mountain sheep, deer, elk and bear. Mountain sheep may be seen on the summit of Mt. Henry as one rides along the Mt. Henry trail. Leaving Two Medicine Chalets and going to Cut Bank Chalets by way of the Dry Fork trail one may see mountain sheep on the right of the trail feeding or bedded down on the slope of Red Mt. This is a sure sheep location during the summer months. From the top of Cut Bank Pass, looking across the slope on the Cut Bank valley side and to the left, one may see mountain goat on the slope of Mt. McClintock.

On leaving Cut Bank Valley and entering Red Eagle Valley one is likely to see elk and deer in most any of the numerous little open meadows or parks. Elk are quite sure to be seen along the open meadows between Red Eagle Camp and St. Marys Chalets, especially in the early morning or just before dusk. Along side the trail at this place are beaver cuttings. It is interesting to notice the height of some of these cuttings, for it indicates that the beaver were short of food during the winter and had to fell some of the trees during deep snow.



Black and brown bear may be seen at the garbage pit at St. Marys Chalet. Along the trail from St. Marys Chalets to Going-to-the-sun Chalets one may see blacktail deer, especially between the Golden Stairs and Going-to-the-sun Chalets. Black, brown and occasionally a grizzly bear may be seen nearly every evening just before dark at the garbage pit behind the chalets.

Going from Sun Camp to Many Glacier by way of Piegan Pass, mountain goat may be seen feeding or bedded down across the valley to the left on the slope of Piegan and Pollock Mountains, also on the slope of Mt. Gould on the Many Glacier side of the pass. Blacktail deer are seen at times along the trail between Piegan Pass and Many Glacier Hotel. Mountain sheep can be seen almost any time on Mt. Altyn from the porch of the hotel. Black, brown, and occasionally a grizzly bear frequent the hotel garbage pit.

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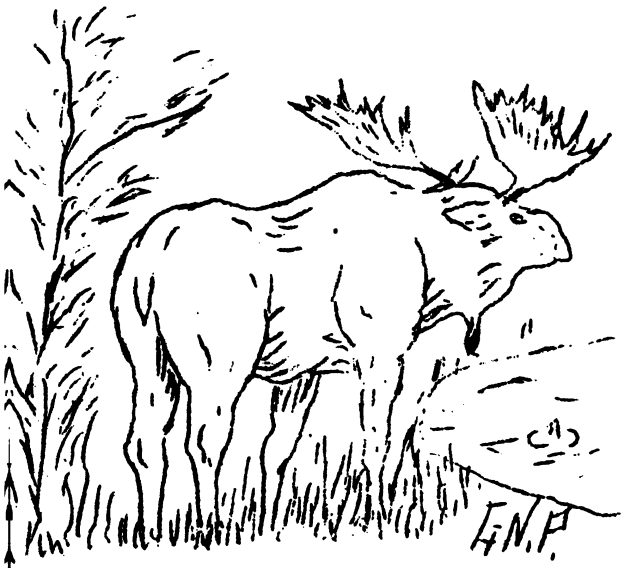
On travelling over the trail from Many Glacier to Granite Park by way of Swiftcurrent Pass one is almost sure to see mountain goat to the right of the trail on the slopes of Mount Wilbur, as well as among the rocks on the right slope near the top of the pass. At Granite Park, white tail deer are apt to be seen below the chalets in the meadows just before dusk. This is on the west slope of the continental divide in a great white tail deer country.

Along the Garden Wall trail between Granite Park and Logan Pass mountain sheep are nearly always to be seen above the trail. In dropping down from Logan Pass to Going-to-the-sun Chalets blacktail deer and an occasional elk may be seen. Bear tracks are common on the trail.

Between Going-to-the-sun Chalets and Sperry Chalets one is quite sure to see mountain goat on either side of Gunsight pass, and near the Chalets. White tail deer are often seen between Sperry Chalets and Lewis' Hotel on Lake McDonald. Bear may be seen at the garbage pit near this hotel.

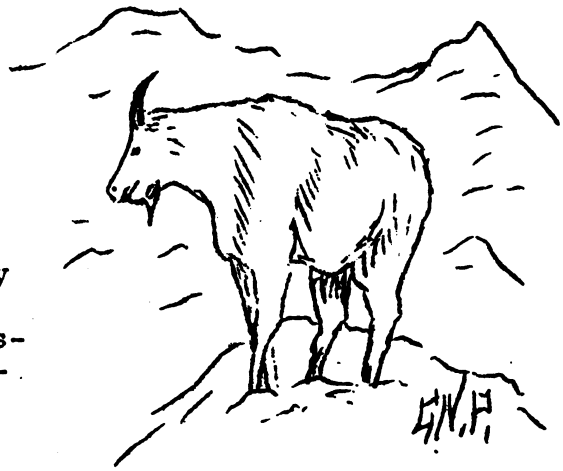


Following what is known as the North Circle trip, one may see mountain goat to the right of the trail on rock ledges on Flat Top. At Flat Top camp whitetail deer are seen daily.

Entering the Waterton Lake country, game signs on the trail are plentiful. Blacktail deer may be seen in the open spots in the timber. The trail passes by interesting beaver dams and lakes that give a close-up of beaver engineering skill. In the meadows beyond both deer and elk may be seen, and sometimes, even an occasional moose near the shore of Kootenai Lake to the left of the trail.

In the evening from the veranda of Goathaunt Chalet beavers are seen swimming in the lake between the chalet and the outlet of Kootenai Creek. A common swimming point for these is out in front of the ranger station. Bear may be seen at the garbage pit behind the chalets or at the ranger station. With binoculars, one may see mountain goats feeding along the slopes of Goathaunt Mountain. This is a great place for mountain goats during the summer months.

If one watches closely, one may see mountain goat among the rocks above beautiful little Indian Lake at the foot of the Indian pass, on the trail to Belly River and Crossley Camp. Elk are seen in open parks between the pass and Crossley Camp. Bear may be studied at close quarters in and about the camp. The trail from Crossley Camp to Many Glacier by way of Red Gap Pass is through one of the best mountain goat districts in the park, which includes the mountains on both sides and at the head of Elizabeth and Helen Lakes. On both sides



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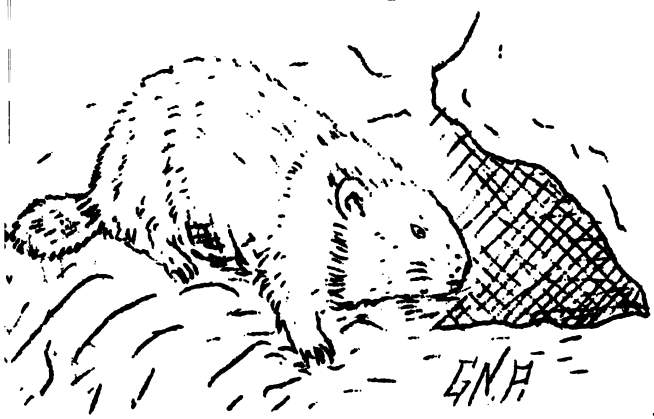
of Red Gap Pass are the deeply worn goat trails crossing the pass to the neighboring mountain slopes. If one will examine the rocky ledges to the right of the pass and follow with the eye all the way around the amphitheater which lies below, mountain goat are sure to be seen, often in groups of several each.



On leaving the timber nearing the top of the pass, one enters the home of the great hoary marmot, which suns himself on top of a rock or runs from one rock to another, stopping every once in a while to utter his peculiar piercing whistle. On quiet days, it is possible to see trout breaking water on the mirror-like surface of Elizabeth Lake.

Following down Kennedy Creek one may see deer in the meadows along the creek. A good mountain goat country is to be found along the Bowlder Pass trail. Also as one climbs up Bowlder Pass from the direction of Brown's Pass the little cony or rock rabbit is seen and heard on the rock slides below.

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GLACIAL DRIFT

Bear in Glacier Park - Every district in the Park has its quoto of bear; black, brown, and grizzly. The bear on the west side of the Park have bothered the road camps some but have done no serious damage. A large grizzly entered the Sun Camp chalets this spring and did considerable damage, but it happened through the fact that one of the windows was left without a shutter last fall.

- Forrest L. Carter, Chief Ranger

Deer in Glacier Park - The home of whitetail deer in Glacier is within the timbered areas at lower altitudes on the west side of the Park. They are now well within their summer range, having followed the retreating snow with the advancing season. The real home of blacktail deer is in higher altitudes and in the more open country on the east side, and though a few appear in every district, their numbers are greatly held down by the fact that their winter range is outside the park in the Blackfoot Indian Reservation where they are unprotected. Several salt licks are maintained for blacktail deer on the west side, and many spend their winter in the vicinity of these.

- Forrest L. Carter, Chief Ranger

Mountain Goats and Mountain Sheep - Glacier is the only National Park in which mountain goats and mountain sheep may be seen together. This is interesting since there is existant a myth that these two animals are deadly enemies, a fiction probably invented to account for the fact that they were seldom or never seen together. Goats and sheep have different habitats to satisfy differences of food and safety requirements. Sheep are grass-eating animals. They are wary and fleet-footed, escaping danger like deer by their agility. The clumsy, slow-moving goat brouses on buds and twigs, and is dependent for safety on the inaccessibility of his haunts.

- G.C.R.-

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EDITORIAL PAGE

ON THE SIGNIFICANCE OF BEING A RANGER NATURALIST

A lady once boarded a crowded passenger train in the great San Joaquin Valley in California. She took a seat alongside a young man who soon engaged in conversation with her. He had just spent a summer in Yosemite Valley and was leaving for school at an eastern university. She inquired whether he knew a certain acquaintance of hers, a young man who had served as a ranger naturalist in the park. Oh yes, he had heard of him, he was one of these fellows that had a tremendous book-knowledge about the park, but no real first-hand information.

The editor is personally adquainted with the naturalist referred to in the above conversation, and knows such criticism was not only entirely without foundation, but also unjust. This same naturalist, coming from a prairie state, worked eight-two consecutive days in the park that summer, and had had all of his Sundays and one extra day to do as he pleased. In his desire to get authentic information, during his spare time he actually covered, on foot, 880 miles of distance, with climbs aggregating 160,000 feet. Often he would hike all night in order that he might reach a more remote corner of the park, or would hike twenty miles after six o'clock in the evening when the day's work was done. Needless to say, he was a highly successful naturalist. Such conscientious effort by an intelligent being will inevitably produce good.

In further argument against any possible opinion that ranger naturalists are book-educated only, the editor desires to relate a few [illegible] facts in behalf of the men on his staff. Ranger naturalists are trained scientists, many of whom come from faculties of leading universities, many holding higher degrees. With fine unselfishness of purpose, they are willing to devote their vacation months at relatively low remuneration just for the sheer joy of imparting the key to their enthusiasm and the source of their inspiration to others, who, were they but directed, would also find the pleasure that comes to him who sits at the feet of Nature to listen to her stories unveiling the secrets of the Universe. These men regard their work, like virtue, as its own reward.

No blind leaders of the blind, these, but true scientists loving the virtues that science holds paramount, truth, tolerance, humility. No distortion of the turth here just to satisfy an innate craving for the dramatic or sensational, no saying that an object is black despite the fact that the eye knows it to be white. Theirs the prime duty of dispensing accurate information, without extenuation, distortion, or glorification. These are the disciples of the great gospel of science, whose foremost commandment is this, we must try to see the truth just as it is, unadulterated and undiluted, whether we would or not. Theirs the motive to learn what is true in order to know what to do that is right.

Not content with opinions and statements of others, the ranger naturalists seek out as many facts as possible by observation. These they correlate and explain by generalization and hypothesis, and with these tools, endeavor to search for further light and knowledge. Quite naturally they do not disdain to consult scientific literature and the opinion of others. In fact, sometimes no other means are

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available. Yosemite, like Glacier Park, is topographically so constituted that the eastern and western sectors of the park are totally different, there being typical Great Basin conditions around Mono Lake in contrast to the better known "Sierran" environment of the west slope. One ranger naturalist, an Easterner, spending his first summer in Yosemite, had carefully and decorously built up a knowledge of the eastern slope thru books and conversation. All summer long he made delightful and profitable contrasts between the flora and fauna of the two slopes, and many people who visited Mono Lake later returned to the Valley to tell him what a pleasure it had been to search out the features that he had explained to them previously. Needless to say, he received the greatest thrill of all, when, at the end of the season, he was privileged to go and see for himself the objects about which he had lectured all summer, to find substantiation of his statements in the natural features about him.

As has frequently been said, knowledge is oft gained only with intense sacrifice. This statement also holds true for the knowledge acquired by naturalists in our park service. It might be told of the naturalist who walked twenty-two miles to find some dogtooth violets because he was unfamiliar with them, and because they were one of the showier flowers of the park that bloomed before the tourist season. Or about the naturalist of Yellowstone Park who spent two days and two nights of ceaseless vigil to learn the breeding habits of the golden-eye. Or about the naturalist of Grand Canyon National Park who sacrificed his life in the muddy waters of the Colorado, while endeavoring to obtain specimens and exhibits for the museum on the rim! What price these tiny contributions to the tremendous sum total of all our knowledge! These are the men that seek to offer the park visitor bread for stones, that see in Nature the pathway to God.

Thomas Carlyle's whole philosophy of life might be summed up in his own words, "It is an earnest thing to be alive in this world." A comparable earnestness pervades the innermost being of the conscientious ranger naturalist. It might be well to conclude with a quotation from the Yosemite Ranger Naturalists' Manual which sums up the qualifications of the ideal man for this service:

"The good guide is more than a compendium of names of flowers, birds and trees. He must have ready for immediate use ecology, ethnology, history, legend and tradition and a score of natural sciences. If, in addition, he be endowed with a sense of the aesthetic and artistic, if he possesses a background of experience and an acquaintance with human ideals, aspiration and transactions, if he be able to draw aid and example from the world's best literature, and the thoughts of her greatest minds, and, above all, if he be favored with an unbounded enthusiasm for Nature and her most intricate and latent secrets, he cannot fail to interest, yea even inspire, his listeners, and to impart in unceasing measure a portion of his own bountiful self and his abundant life. Fortunate and rare, indeed, the guide who possesses all of these qualities, and fortunate they who come into his sphere."

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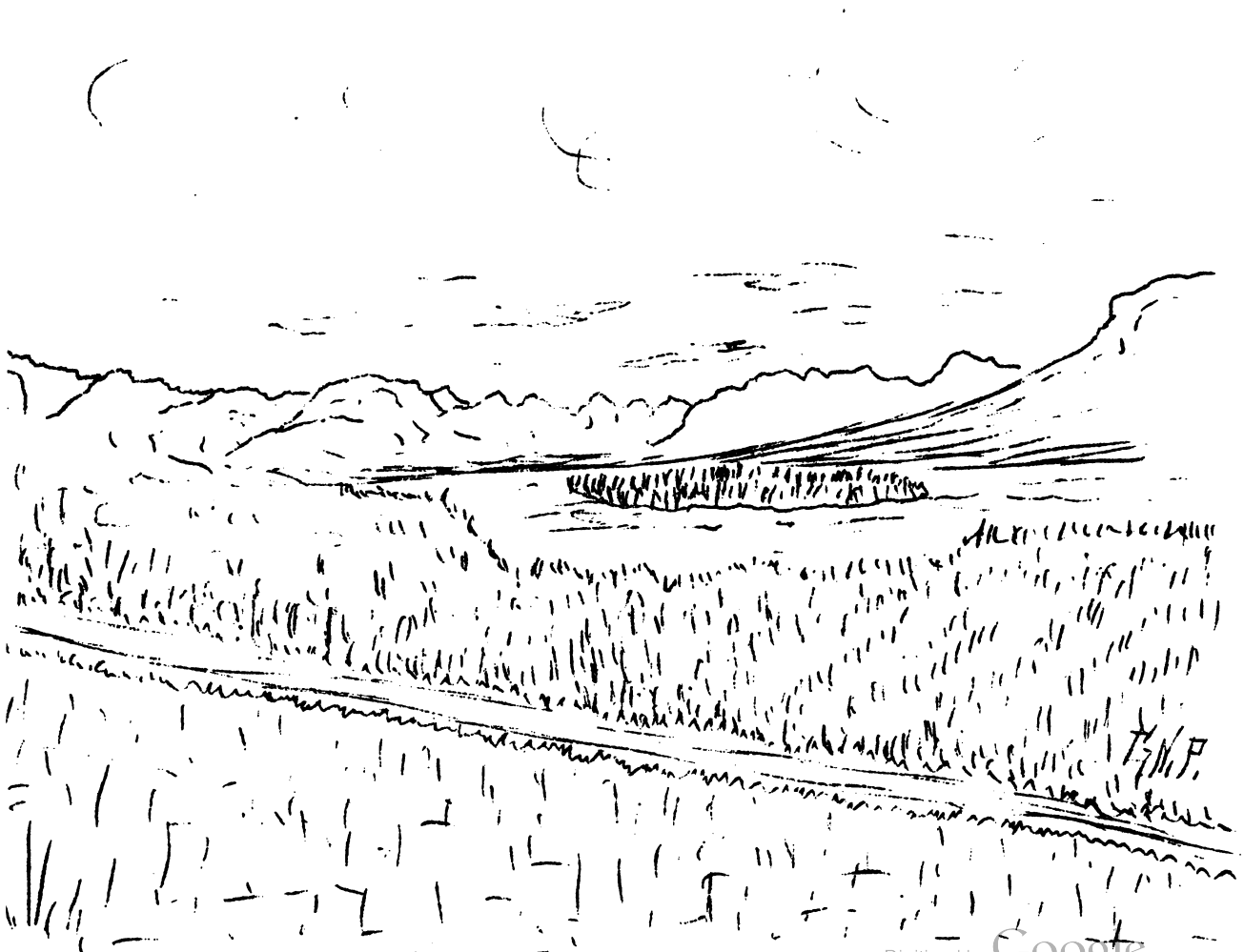
WHO'S WHO
In Glacier National Park History

2. Hugh Monroe.- (1784-1892). Long ago in the dawn days of Montana history, a Scotchman, Hugh Monroe, was setting traps along the streams of the Northwestern Plains, a solitary figure without a white rival in a vast and adventuresome territory. In 1846, in company with a band of Kootenai Indians, he visited the shores of the St. Mary Lakes, being the first white man, so far as is definitely known, to set foot within what are now the boundaries of Glacier National Park.

Mr. Monroe first came to the Northwest Bountry in 1813. He married a Piegan maiden, and lived with the Blackfeet for many years. They called him Rising Wolf, because he had a habit of pushing himself up on his elbows as he arose from his bed in the morning (Eakin). He died in 1892 at the ripe old age of 108 years, and was buried at Holy Family Mission on the banks of Two Medicine River.

The name, Rising Wolf, has been given to one of the most imposing mountains of the park. Far out on the Plains it can be seen, rising above its base surroundings, lifting its highly colored, cloud-capped summit high above the placid waters of Two Medicine Lake.



Lower St. Mary Lake

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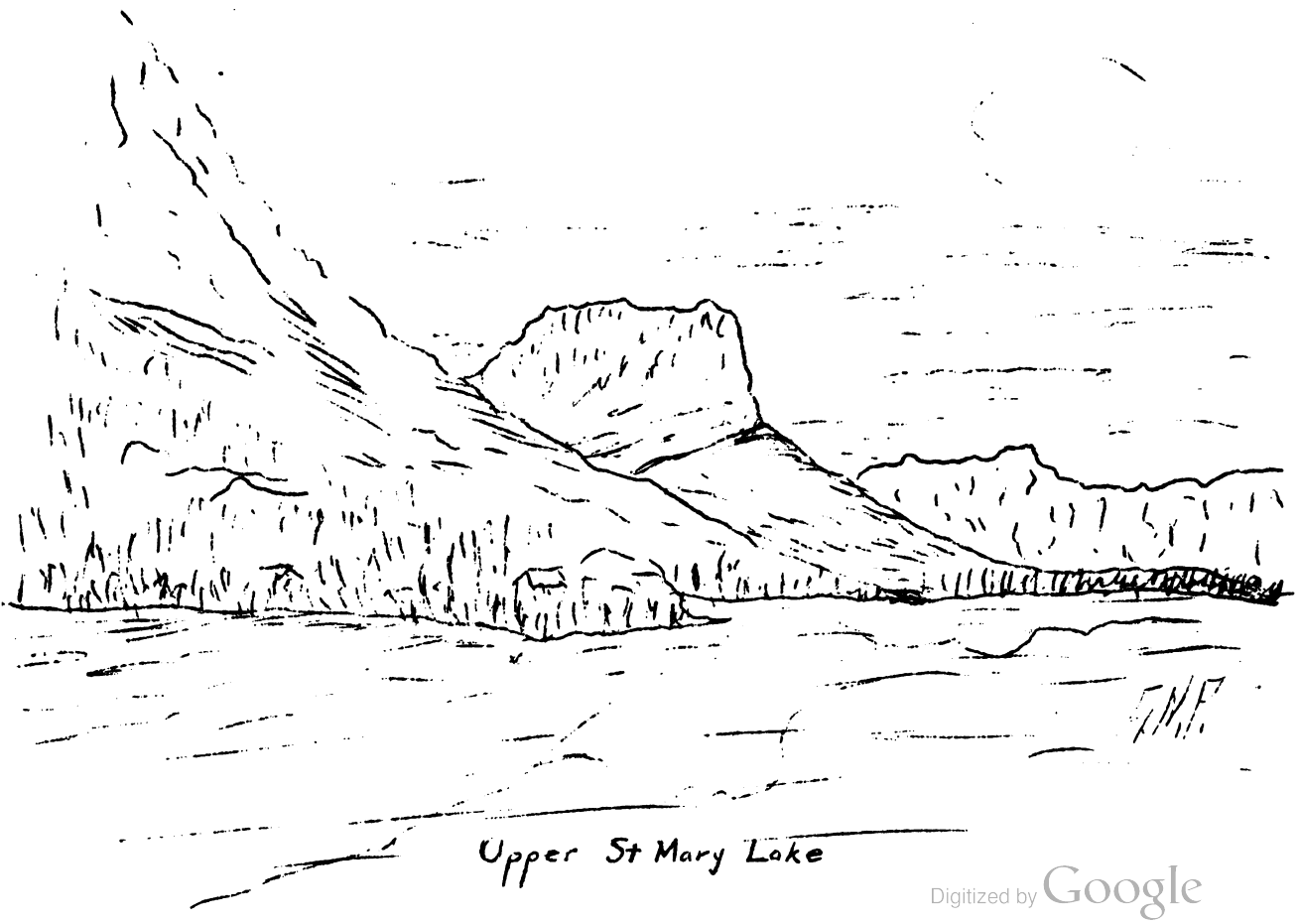
PLACE NAMES
of Glacier National Park and Vicinity

2. ST. MARY LAKES. In 1846, Hugh Monroe, trapper and a member of the Hudson's Bay Company, visited and named St. Mary's Lakes. On beholding their beauty, he is said to have been overcome with emotion. He erected a cross on the shores of Lower Lake and named them after the Virgin, Mary. He is quoted with a statement than an rone noire, a missionary priest, had visited the lakes at an earlier date, and rumors have it that this was none other than the Belgian, Pierre de Smet.

The Piegan Indians called the lakes the "Entrance" or "Walled-in" Lakes, although they are spoken of today as Pah-toh-ahk-kee-oh O-mock-sick-i-mee, the Good-Spirit-Woman Lake, referring to the English name. The Kootenais called them Old Woman Lakes, for the surface is constantly white with wind-driven waves.

Mr. James Doty, meteorologist for the exploring party of Governor Isaac I. Stevens of Washington Territory, camped on St. Mary Lakes in May, 1854. He called the Upper Lake by the descriptive name, Bow Lake, and the Lower Lake, Chief Mountain Lake. Maps of the Survey applied this latter name to the present Waterton Lake, despite the fact that Doty specifically stated in his reports that his survey showed the lake and its environs to be wholly upon American territory and gives its exact location. The outlet of St. Mary Lakes, St. Mary River, was called by the Blackfeet, Mo-ko-un, Belly River, which name is now applied to a stream further north.



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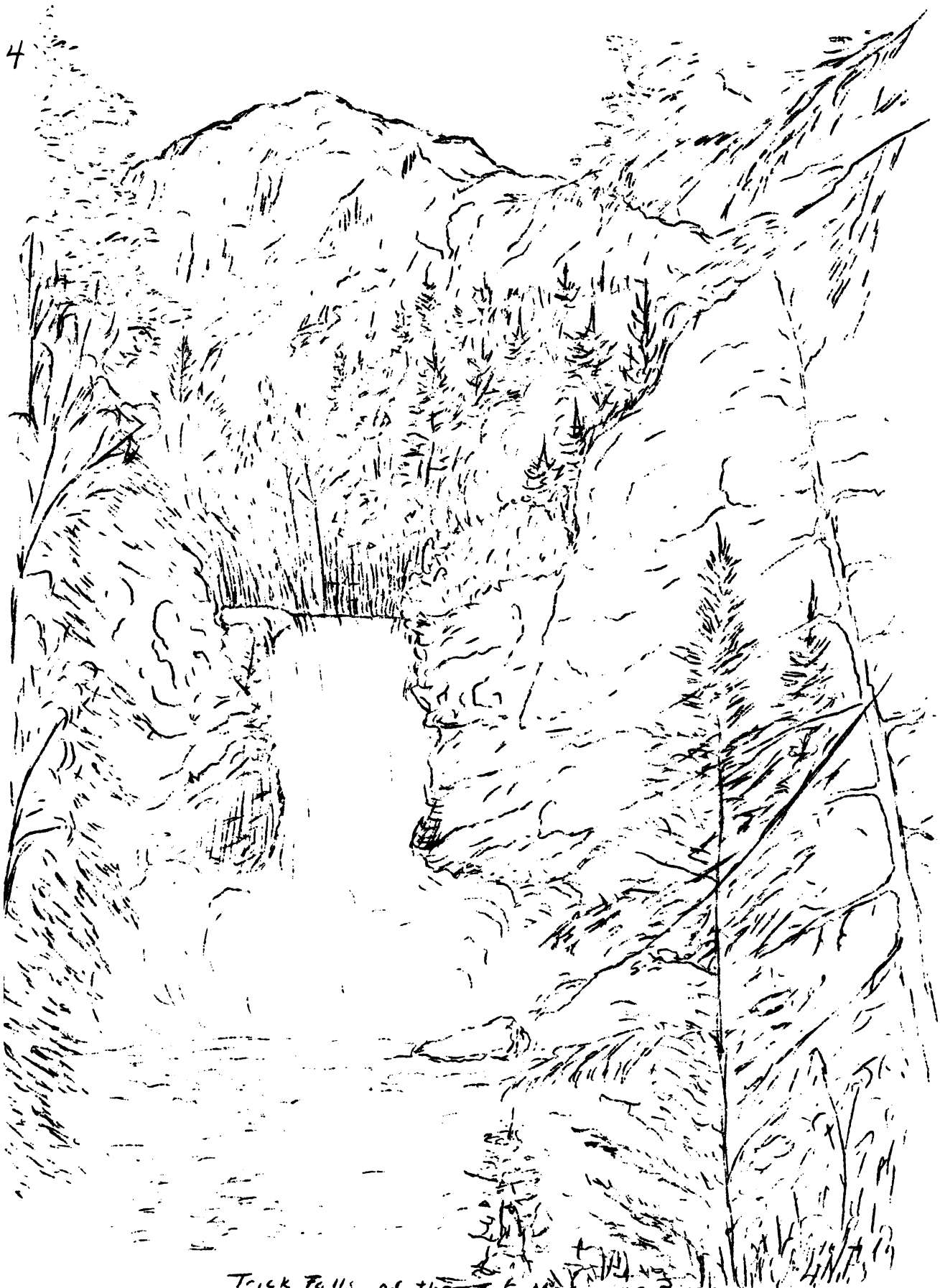

Trick Falls of the Two Medicine River
Rising Wolf Mt. (Elev. 9,505')

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NATURE NOTES FROM GLACIER NATIONAL PARK

AUGUST 1929

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UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
GLACIER NATIONAL PARK

NATURE NOTES FROM GLACIER NATIONAL PARK

Volume II August, 1929 Number 3

A monthly pamphlet edited by the park naturalist and distributed by the Educational Division of Glacier National Park to all interested in the park and its natural history.

J. Ross Eakin, Park Superintendent
G. C. Ruhle, Editor

"NATURE IS MORE THAN TRUTH,
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A PARK FLOWER

By popular choice, bear grass (Xerophyllum tenax) seems destined to be the park flower. Doubtless the most conspicuous of park wild flowers, this showy member of the lily family covers vast areas of the park with its tall, feathery, club-shaped heads in years of abundant bloom. Some Indians use the tough, grass-like leaves for making fine baskets, and hence it is also called basket-grass and squaw grass, but the name bear grass is wholly inexplicable, for it is not a grass and bears apparently have nothing to do with it.

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THE GLACIER PARK FISH HATCHERY

W. C. Buckmaster,
U. S. Bureau of Fisheries.

On the creek below Glacier Park Hotel stands the United States fish hatchery erected in the fall of 1918. It was occupied for the first time on April 1, 1919, on which date a shipment of Eastern Brook trout eggs was received from the Fisheries' Station at Leadville, Colorado. During the past ten years, millions of trout have been hatched, reared, and planted from the hatchery, among which the following species have been represented: Eastern brook, blackspotted (cut-throat), lake (Mackinaw), and golden, added to which is that most beautiful of game fish, the grayling.

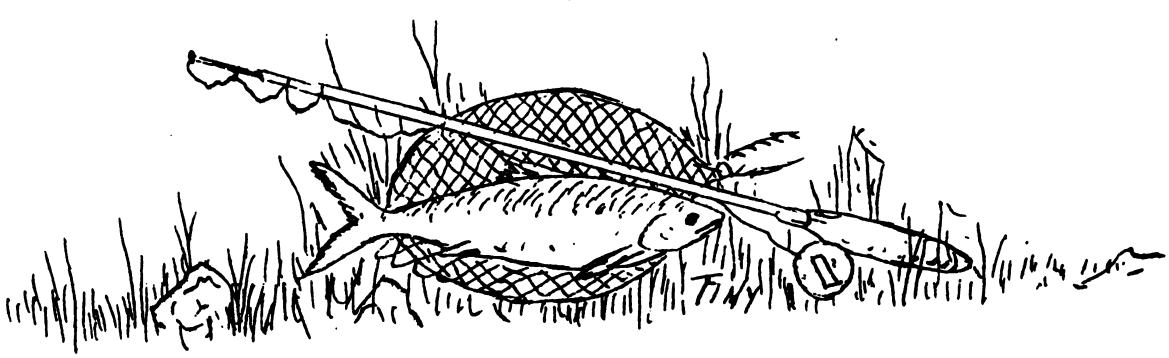
A variety of trout from widely separated parts of our country are being reared in the hatchery at the present time. The oldest are blackspotted trout from the Nevada Fish and Game Commission. There are also rainbow trout from Madison Valley, Montana, and blackspotted trout from Yellowstone Park, Georgetown Lake and our own Lake McDonald. The latter are hatched from the first trout eggs gathered in this region.*

Over a million and a half trout were planted in Glacier waters last season. Several days ago (July 15) golden trout in the eyed-egg stage were planted in Wurdeman Lake, west of Waterton Lake. This is the second lot of these beautiful trout to be planted in that lake, a previous plant being made in 1928.

At present eight rearing ponds sixty feet long and seven feet wide are being installed east of the hatchery building. These will not only relieve the crowded condition of the hatchery troughs that prevailed during previous years, but will also permit rearing the young fish to greater sizes, thus greatly increasing the efficiency of the hatchery practice.

Visitors at Glacier Park are cordially invited to visit the fish hatchery building. Some one connected with the service will be at hand at most all hours of the day, and will be glad to answer questions relative to the practice in the local station.

*See page 16 of this volume for a story connected with this collecting.



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- MY GOLDEN WEST -

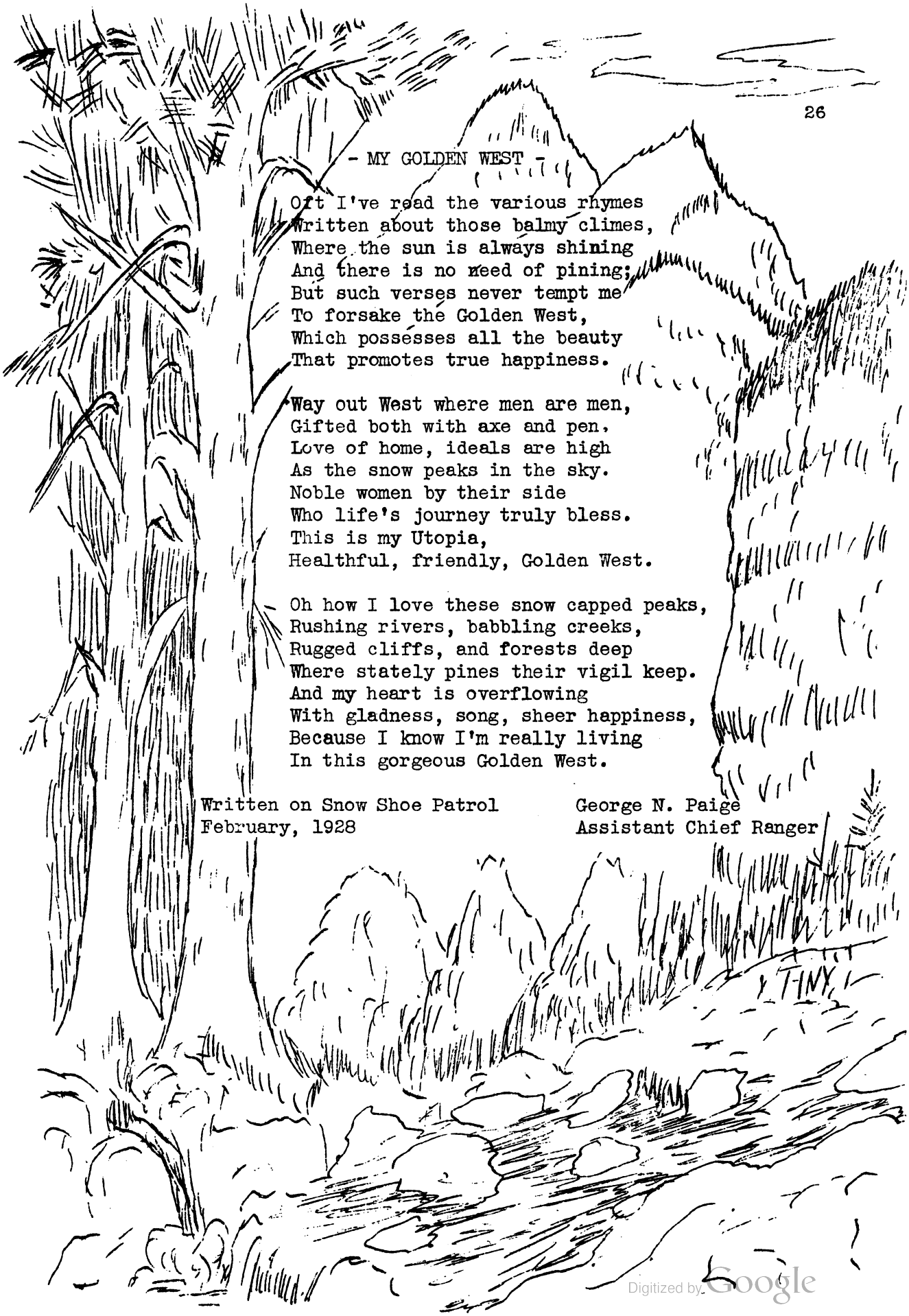
Oft I've read the various rhymes
Written about those balmy climes,
Where the sun is always shining
And there is no need of pining;
But such verses never tempt me
To forsake the Golden West,
Which possesses all the beauty
That promotes true happiness.

Way out West where men are men,
Gifted both with axe and pen,
Love of home, ideals are high
As the snow peaks in the sky.
Noble women by their side
Who life's journey truly bless.
This is my Utopia,
Healthful, friendly, Golden West.

Oh how I love these snow capped peaks,
Rushing rivers, babbling creeks,
Rugged cliffs, and forests deep
Where stately pines their vigil keep.
And my heart is overflowing
With gladness, song, sheer happiness,
Because I know I'm really living
In this gorgeous Golden West.

Written on Snow Shoe Patrol
February, 1928

George N. Paige
Assistant Chief Ranger



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THE 1929 RANGER NATURALIST STAFF

There are four men on the 1929 staff of ranger naturalists in Glacier Park. Of these, Dr. M. J. Elrod is dean, having served as a ranger naturalist in this park every summer since 1922. Dr. Elrod has visited this region annually since the early nineties. He has prepared a popular guide of the park and is author of many articles and pamphlets, among which is the government publication, "Some Lakes of Glacier National Park." He has carried on much local scientific investigation, so that it is perhaps safe to say that no other scientist possesses a more intimate knowledge of Glacier Park and its wonders than he. Dr. Elrod has been head of the department of biology at the University of Montana for many years. He received his undergraduate training at Illinois Wesleyan of Bloomington, Illinois. He is stationed at Many Glacier Hotel.

Mr. M. J. Harbaugh, ranger naturalist at Going-to-the-Sun Chalet, was a student of biology and medicine at the University of North Dakota and at Montana State University, and has taken graduate study at John Hopkins at Baltimore. He was instructor of biology at Montana State University and will serve in a similar capacity at Kansas State Agricultural College in the coming school year. He has served the Glacier Park Educational Division since 1927.

Mr. M. E. Peterson is stationed at Glacier (Lewis') Hotel on Lake McDonald. He is a graduate of Montana State University and has served as a ranger naturalist in Glacier Park since 1928.

Mr. Charles P. Bradford is the newest member of the naturalist staff, being transferred from the park ranger staff in the past month. Mr. Bradford received his university training at Maine. He is stationed at Many Glacier Hotel.

The badge of Service.

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EDITORIAL PAGE

PLACE NAMES

Glacier Park is extremely fortunate in having many of her leading landscape features named by a man of foresight and intelligence, George Bird Grinnell. Perhaps no other National Park in the United States is blessed with a greater wealth of picturesque place-names, such as Going-to-the-Sun, Almost-a-Dog, Three-Suns, Dawn Mist. It may be argued that few of our names have a strikingly significant connection with the features that they are attached to, but that is true everywhere. As is believed by many that have thoroughly studied our place names, it is true that only a few of the more conspicuous landscape features of the park originally possessed Blackfeet or other Indian names. It is true, especially so in the local instance, that many Indian names are so long and unpronounceable in the original that they are utterly impossible unless altered beyond recognition. It is also true that our park has preserved many of the original names, translated, St. Mary Lake being one painful exception.

It seems to be characteristic of the English-speaking people, with fine disregard of tradition and priority, to scrap original names for their own common-place designations, often tacitly permitting the replacement of some venerable old place-name that has served through unknown centuries by the name of some would-be-great who wishes to stave off inevitable oblivion that engulfs most all with the passing decades. A Mountain-that-was-God becomes Rainier; a Denali, Home-of-the-Sun, becomes McKinley, a Chomolungina, Goddess-Mother-of-Eternal-Snows, becomes Everest; a Pohono, Spirit-of-the Evil-Wind, becomes hackneyed Bridalveil Falls.

But why preserve these original names? What do they mean? Who will bother himself with their meaning? What difference does it make whether they be preserved or not? Who cares anyhow?

Leaving aside any consideration from a higher, a traditional, a sacred basis for argument, it is just this. Those who care little about the perpetuation of an original name, care even less about the Smiths or Jones who seek to perpetuate their names, not through strength of deeds, but on the handiworks of God. Somehow I cannot help feel that here is something that bears similarity to the carving of one's name or initials in public places.

As for the substitution of descriptive names for originals, little better can generally be said. There are scattered over the world a hundred Bridal Veil Falls, a hundred Bald Mountains or Old Baldies, a hundred Rocky Gorges. For the sake of variety, then, if for nothing else, it is commendable to avoid such overworked terms. A lecturer on Jasper Park told of the beauties and Indian traditions of those stark and sombre pinnacled crags which border Tonquin Valley, only to finish with the remark: "We have changed the name to the 'Ramparts'", apparently with great but questionable pride.

Among the recent decisions of the Geographic Board, Glacier Park has gained some very happy and commendable changes. These include the substitution of "Morning Eagle" for "Bridal Veil" (Falls) and "White Quiver" for "Washboard" (Falls) and the addition of such names as "Napi" and "Feather Plume". Highly appropriate and desirable are other changes such as McDermott to "Swiftcurrent"

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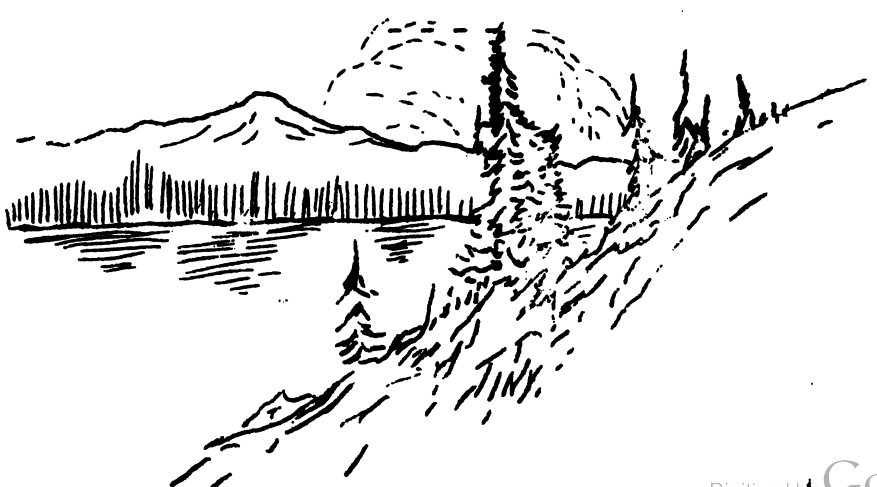
and "Little St. Mary" to "Lincoln". (See page 33 for these changes).

This number is dedicated to 'Place Names'. The greatest purpose of our National Park Service should be its noblest, the purpose of conservation. In National Park areas at least, if in no other areas within our great United States, let us keep inviolate the sacred traditions of priority, let us clad our noblest landscape features with designations as befitting and as beautiful as the environment in which Nature in her own inimitable way has placed them, let us in all sincerity conserve our original place-names with an intensity of zeal that parallels that of our desire for conservation of our natural features, our flora and our fauna. Our National Park Service has an unselfishness and nobility of purpose which is unsurpassed by any other branch of public endeavor. Let its staunchness, its earnestness, its freedom from materialism grow until it pervades and saturates its tiniest details, let it never forget that it functions not for the present alone but for illimitable futurity, that its highest endeavors of today can open wide the gates that stem an overwhelming flood of treasures to sweep us into the realm of a greater tomorrow.

- - - -

A SUGGESTION

It seems inevitable that every important or scenic feature must bear a name, for convenience if for no other purpose. Before some one proposes that such overworked names as Scenic Drive and Inspiration Point be given to the highway across Hudson Bay Divide and the point of vantage where one may look up the Valley of St. Mary, let me enter a plea for a name with Indian flavor as free as possible from the commonplace. The editor is yearning for such names as Trail-to-the-Sun and Going-to-the-Sun Point, and the establishment of a picturesque name such as "The Parting-of-the-Waters" to the crossing of the highway over Hudson Bay Divide.



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GLACIAL DRIFT

Goats at Sperry Chalets - Even though much dynamiting is now being done daily on the trail from the chalet to the glacier, mountain goats are frequently seen on the walls of Edwards and Gunsight Mountains by guests of Sperry chalets, especially during late afternoon to evening hours. One night, thirteen were visible on the former and seven on the latter mountain, nor was this proclaimed unusual by chalet residents. That night, five goats came down on the chalet porch at midnight, seemingly to find great sport in clambering up and jumping off.

Like other ungulates, goats are very fond of salt; so Hildor Strand, glacier guide, has put out cakes of rock salt at appropriate places. Formerly salt was put on chalet window sills, but guests on suddenly awakening were frightened by the goats looking in at them, so the practice has been discontinued. Mr. Strand says that two years ago as many as twenty-seven goats were upon the porch at one time. Like elk and deer, goats do not seem to care so much for salt later in the season and consequently stay at higher elevations. The total vertical range of the goat appears to be about three thousand feet.

- G.C.R.

Dejection - It was late on a sparkling July afternoon. A weary and footsore party had just descended upon Sperry Glacier from the summit of Gunsight Mountain, where an unexpectedly sublime panorama on all sides had taken them by storm. On the summit, they had seen far below the cobalt blue waters of Lake Ellen Wilson washing the precipitous cliffs of Mount Jackson, four thousand feet high. To the southward, immediately across the broad emerald meadowland bordering the Middle Fork of the Flathead River stretched the rounded summits of the Swan Range, surmounted by snowy GN Peak with the bluish-white ice of GN Glacier reposing against its northern slope; beyond lay imposing masses of the Mission Range with their dominating summit, Mt. McDonald; far on the horizon, 135 miles away, loomed the mountains that border historic Lolo Pass over which the great Chief Joseph led his stalwart Nez Perces on a 1200-mile pilgrimage to the land of promise and peace in Canada, a pilgrimage doomed to heartrending disappointment, disaster, and death. To the west rolled undulating ridges of forest clad ranges, far into hazy distance. To the east through a gap in the mountains shimmered the blue waters of St. Mary, from whose shores the white man first looked upward on glories of an unborn glacier. Beyond, like a billowy sea, the variegated greens of the Great Plains surged on until blended with the blue of great distance. To the north, the lofty park mountains lay piled in picturesque disorder, glaciers clinging to sheltered cirques and fleecy clouds growing or disappearing as they climbed up the mountains or slid over jagged crests. On reaching the uppermost pinnacle, each uttered exclamations of joy and admiration, each started taking snapshots in every direction. It was all so irresistible, and soon every film in the party had been completely exposed.

An exhilarating slide of a quarter-mile down a precipitous snow bank

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followed, and members were still chuckling over the thrill of dashing speed and flying snow as they scrambled over a low hill of morainal rock on the side of the Glacier--and here, with all suddenness, they confronted an old mountain goat, scarcely twenty feet away, busily licking some rock salt placed there by the glacier guide.

These people were residents from Boston, New York, and other places east, had travelled two thousand miles to study the fascinating animal life of Glacier Park, and here before them, almost within reach of the hand, was that most interesting of park animals, the mountain goat, and not a single unexposed bit of film left in any of the six cameras of the party. I leave it to you, gentle reader, to visualize dejection, magnified.

Nor did dejection diminish while the party descended the rocky parapet by the aid of a good steel ladder, and could see the head of the goat as he looked down from behind a ledge, wondering what all of the fuss was about.

- G.C.R.

Billy - The goat seen by the party is an old male, long a favorite with Sperry guests. He is locally called Billy. It is told that he too has come down to the porch, keeping the larger goats away, but apparently ignoring the presence of kids. He has had many pictures taken of him, often within ten feet. Mr. Strand tells of a time when he and a visitor were eating their lunch near the glacier. Billy approached from behind to a distance not greater than eight feet from them. Billy has posed for many of the famous goat pictures of the park.

- G.C.R.

Goats Plentiful on Iceberg Lake Trail - Guides on horseback parties to Iceberg Lake report seeing goats almost daily around Iceberg Lake. This seems to be an unusually good place for tourists to see these interesting animals this summer.

- G.C.R.

Many Kids - Hildor Strand, glacier guide, and others familiar with mountain goats report seeing more kids this year than ever before. 1929 seems to be a good year for kids.

- G.C.R.

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WHO'S WHO
In Glacier National Park History

3. Thomas H. Carter (1854-1911) Thomas H. Carter was born October 30, 1854 in Scioto County, Ohio and in 1865 moved with his parents to Illinois. Here he attended the public schools, worked on the farm and as a wiper in a railroad shop, taught school and peddled books. Later he studied law in Burlington, Iowa and was admitted to the bar in that city. In 1882 he came to Montana and practiced law in Helena, being a member of the firm of Clayberg and Carter. He was elected to congress in 1888 by the Republican party and was a dark horse candidate of that party. When the state of Montana was admitted to the Union in 1889 he was elected again to congress by his party. President Harrison appointed Carter Commissioner of the General Land Office in 1891, from which he resigned July 1, 1892 to become Chairman of the Republican National Committee for 4 years. He was elected senator from Montana in 1895 and while a member of the 56th congress defeated the "River and Harbors bill" making the longest speech ever made in congress to that date. After the expiration of his term in the senate he was appointed to the Board of Commissioners for the St. Louis Exposition. He was elected for a second term to the senate in 1905 and did great service for his state during his term of office. He secured the appropriation for the Milk River Project. Through his efforts Glacier National Park was created in 1910. He introduced the bill for the postal savings banks and his earnest labor in its behalf was responsible for its passage. He is credited with being next to Roosevelt in securing legislation for the great irrigation projects of the west.

He died in Washington, D. C. September 17, 1911. At the time of his death the Washington Post commented editorially as follows:

"Former Senator Carter was one of the best loved men in public life. His manner was so hearty, his wit was so sharp and yet sharp in such a kindly way, that all his fellows loved him. He was a big brave hearted fighter, unafraid and untrammeled except by his own strong principles. He went down fighting. In all his life he never sought cyclone cellars. His masterful grip of political affairs was shown in the way in which he brought about the nomination of Harrison over Blaine; that Harrison was not elected was no fault of Tom Carter's. His usefulness was not over. His death coming so unexpectedly, leaves not only Washington and Montana but also the whole country with a sense of shock and personal loss."

Senator Carter was married in 1886 to Miss Ellen Galen, daughter of Hugh F. Galen a prominent pioneer of the state. They had two sons, John G. and Hugh, both of whom are living. Mrs. Carter makes her home in Washington, D. C. Judge Albert Galen of the supreme court of Montana is her brother. Another brother, James Galen, was superintendent of Glacier Park. Carter Mountain and Carter Glaciers in the northwest section of the park have been named in his honor.

- David Hilger, State Librarian of Montana

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PLACE NAMES
of Glacier National Park and Vicinity

RECENT PLACE NAME DECISIONS OF THE GEOGRAPHIC BOARD. On March 6, the United States Geographic Board made some sweeping changes in Glacier Park names, some of which are as yet unknown even to residents in the park. Among the more important are the following:

3. CURLEY BEAR Mountain (8,000 feet), two and one-half miles south of Upper St. Mary Lake. This was formerly Kootenai Mountain, but the name has been changed to avoid confusion with Kootenai Peak, which is south of Waterton Lake. Curley Bear is a deceased Blackfoot chieftain.

4. EAST FLATTOP Mountain (8,700 feet), north of Upper St. Mary Lake. The descriptive prefix has been added to avoid confusion with Flattop and West Flattop, west of the Continental Divide.

5. FEATHER PLUME Falls is the name given to the beautiful upper falls of Cataract Creek, which flows northward into Josephine Lake. They were formerly called Bridal Veil or Horsetail Falls. The lower falls are now officially designated Morning Eagle Falls.

6. GRINNEL POINT (7,500 feet), the imposing precipitous northeast spur of Mount Grinnell is just across Swiftcurrent Lake from Many Glacier Hotel. It was formerly called Stark Point.

7. LINCOLN Creek rises on the west slope of Mount Jackson, and flows south-west through Ellen Wilson and Lincoln Lakes into the Middle Fork of the Flathead River. The creek, the falls between Ellen Wilson and Lincoln Lakes, and Lincoln Lake were called Little St. Mary Creek, Falls, and Lake, respectively, but they have been given the name of the peak to the north (Lincoln Peak) to avoid the confusion arising from the application of a name containing St. Mary to features on the west slope of the Continental Divide.

8. NAPI Rock is a projection on the northeast slope of Singleshot Mountain. The name in Blackfeet language means "Old Man", who made all the country around the Blackfeet home. It was recommended by Major General Hugh L. Scott, board of Indian Commissioners.

9. SWIFTCURRENT Lake is the new official name of Lake McDermott. It is so called because it is traversed across its lower end by Swiftcurrent Creek. McDermott Falls are now Swiftcurrent Falls, which name was cometimes unofficially applied to Redrock Falls, three miles above Many Glacier Hotel on Swiftcurrent Creek. The stream was early designated by this name, which is descriptive of its rapid fall with no quiet reaches or pools. Mr. G. B. Grinnell mentions it in his first articles of the Glacier Park region in 1885 (Forest & Stream). Swiftcurrent Pass over the Continental Divide at the head of the creek was once called Horsethief Pass, for Blackfoot horses were once driven across it by horsethieves. The glaciers on either side of Swiftcurrent Mountain at the head of the stream are Swiftcurrent and North Swiftcurrent, respectively.

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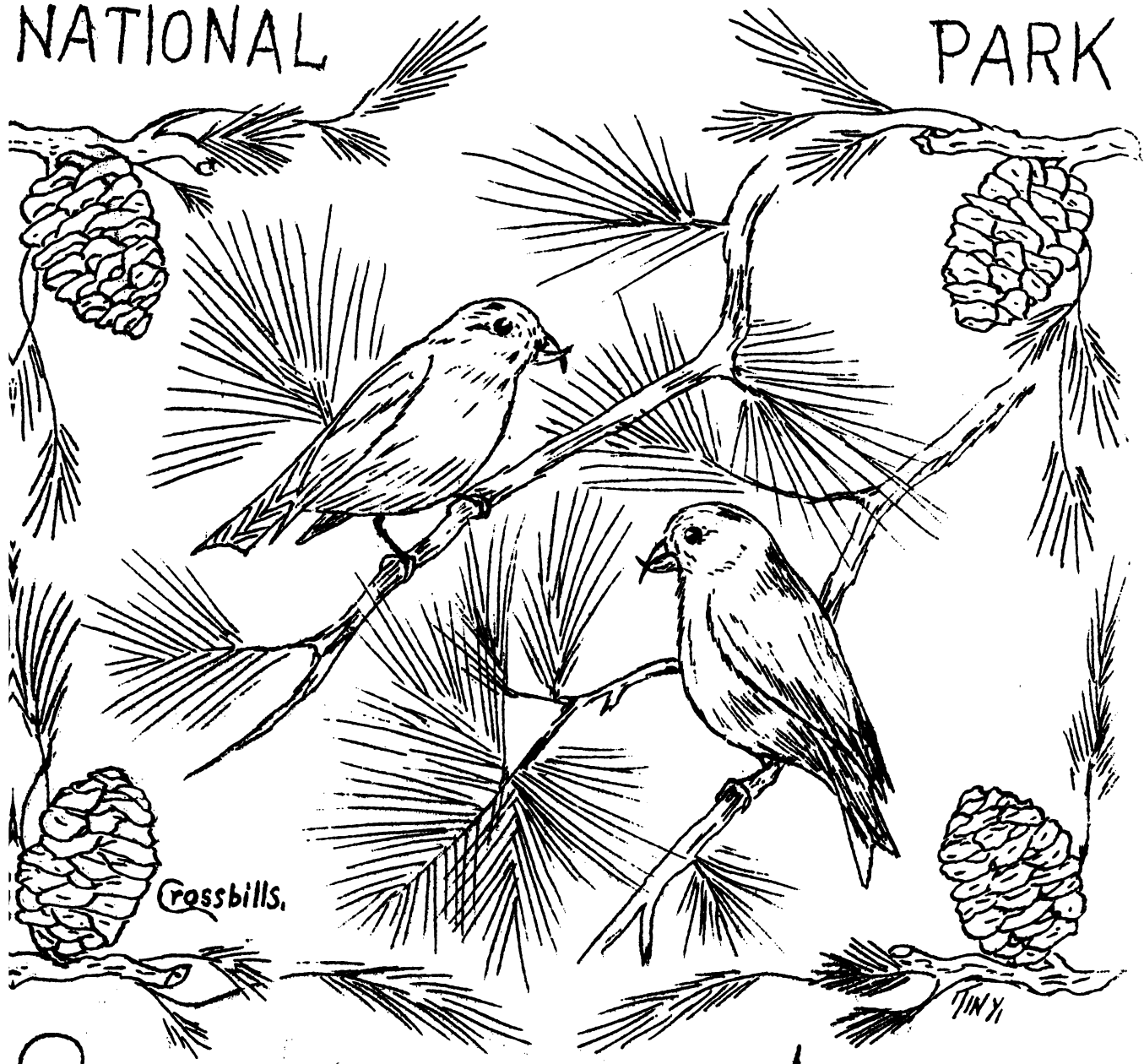
NATURE NOTES FROM GLACIER NATIONAL PARK



SEPTEMBER 1929

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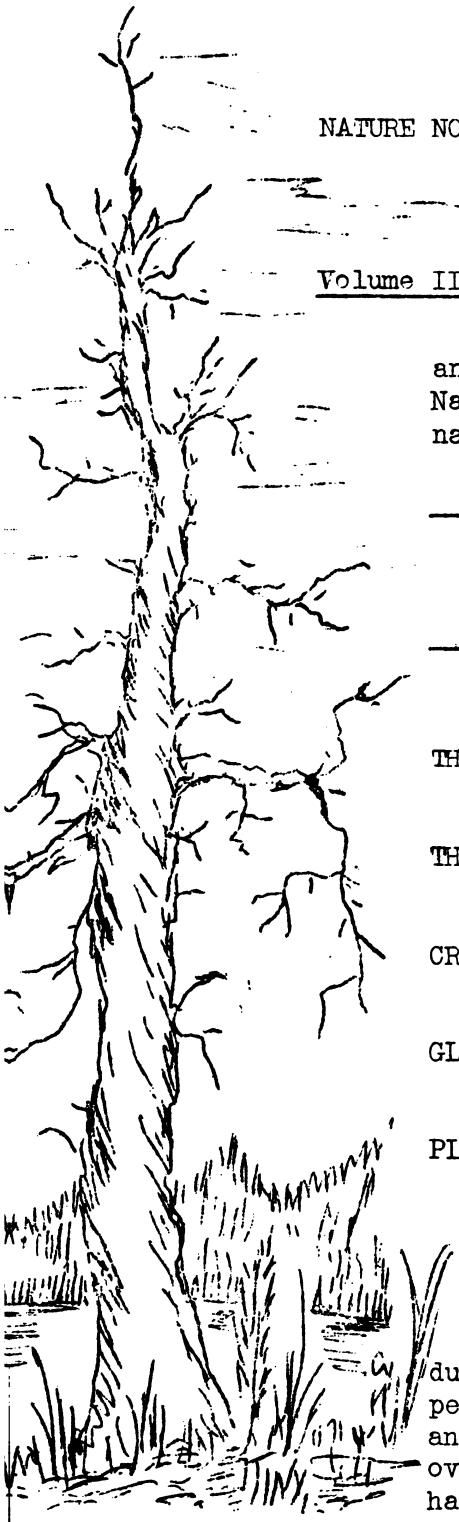
UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
GLACIER NATIONAL PARK



NATURE NOTES FROM GLACIER NATIONAL PARK

Volume II September 1929 Number 4

A monthly pamphlet edited by the park naturalist and distributed by the Educational Division of Glacier National Park to all interested in the park and its natural history.

J. Ross Eakin, Park Superintendent
G. C. Ruhle, Editor

"NATURE IS MORE THAN TRUTH,
IT IS BEAUTY AS WELL."

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APOLOGIA

The great fire which threatened Headquarters during the latter part of August seriously handicapped the normal activities of the Educational Division and delayed the appearance of this September issue by over a month. We trust that readers of NATURE NOTES have not grown impatient because of unavoidable delay.

Ed.

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THE 1929 HALF MOON FIRE

Statement by Secretary of the Interior, Dr. Ray Lyman Wilbur *-

"The fire season of 1929 will take its place in the history of Montana along with those of the disastrous years of 1910, 1919, and 1926. That the most serious fire affecting this region is attributed to an engine burning wood, operated within an area of slashings during the most critical period of one of the driest summers Montana has experienced for years, is a sad commentary on present conditions pertaining to fire prevention and forest conservation.

During the past summer, prior to the start of the disastrous Half Moon fire, the fire protection organization of Glacier National Park had made the remarkable record of suppressing twenty-nine forest fires within the park boundaries with a minimum of acreage burned. Only one fire had exceeded an acre in area, and this one had been confined to three acres, while twenty-seven had been kept down to an area not exceeding one quarter acre each.

The Half Moon fire, which started on August 16, originated on private logging operations at least eight miles distant from Glacier National Park and several miles removed from the nearest national forests. Under the high winds and low humidity prevailing at the time, this fire was carried as a crown fire into both the Blackfeet and Flathead National Forests and entered Glacier National Park on the afternoon of August 20. It is estimated that this fire has covered a total of 90,000 acres and the suppression costs of all agencies involved probably exceed one hundred and sixty thousand dollars. The loss in value of timber destroyed and buildings lost is enormous. In Glacier Park alone approximately 40,000 acres were burned over in the drainage of the North Fork and Middle Fork of the Flathead River, and the suppression expenses for the park alone will exceed one hundred thousand dollars. It is a fortunate circumstance that Park Headquarters at Belton were saved and that very little of the scenic area along the Transmountain Highway was marred by the fire. The skill and persistence of Superintendent J. Ross Eakin and his associates in guarding Glacier National Park in this emergency will be keenly appreciated by all visitors to the Park as they will find it practically unimpaired.

Great as is the need for additional protection forces and fire protection, roads, trails and other improvements within both national parks and national forests, such national reservations will be unable to adequately protect their lands against the inroads of fires originating on private lands either inside or outside so long as the present laxness with regard to proper slash disposal and operation of engines in the woods during periods of high fire hazard is permitted to continue on private holdings. The combined effort of all agencies, both national, state and private, together with the cooperation of the timber land owners, is essential, in order to effect a program for the future that will assuredly prevent a repetition of the circumstances which made this season's catastrophe possible."

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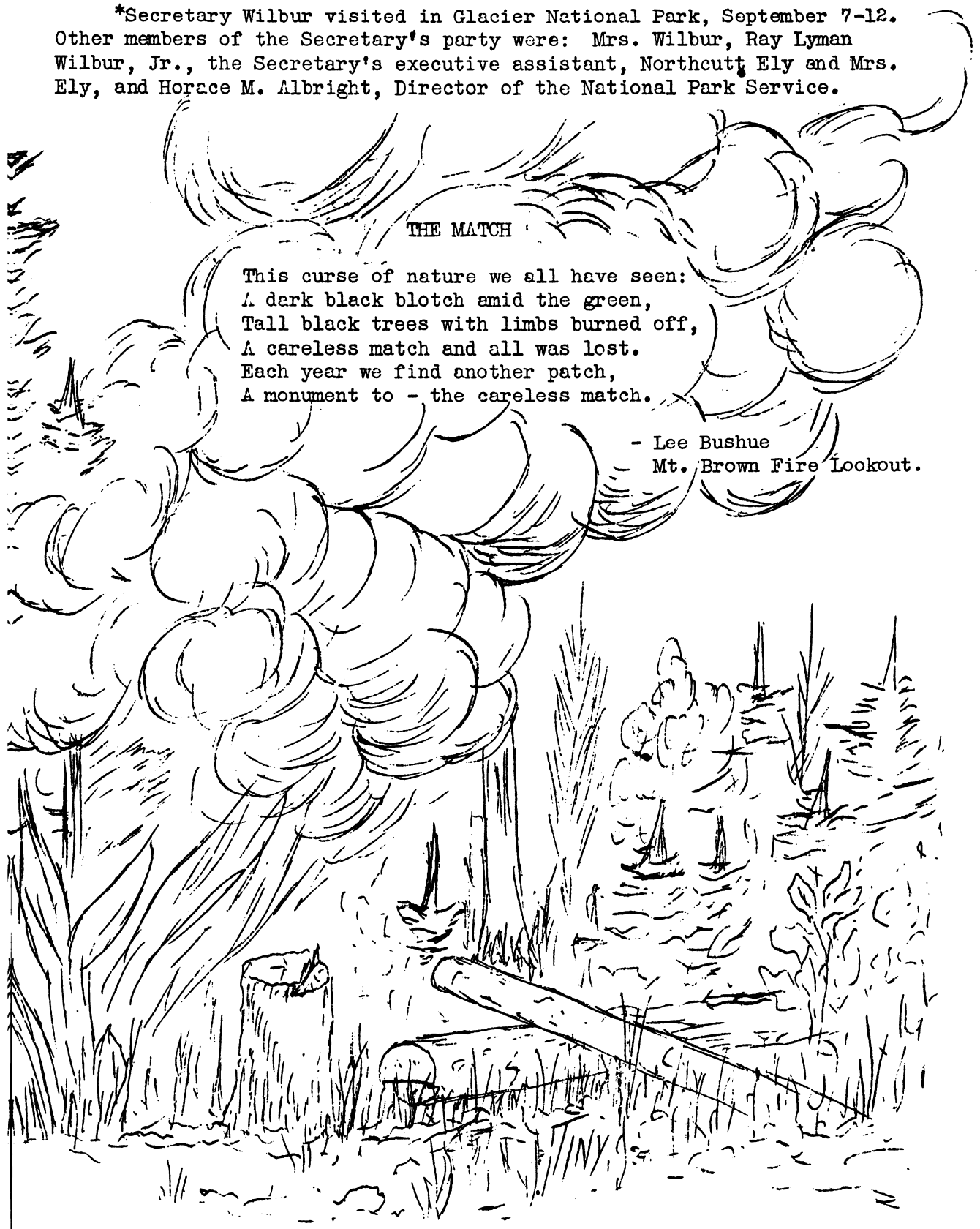
*Secretary Wilbur visited in Glacier National Park, September 7-12. Other members of the Secretary's party were: Mrs. Wilbur, Ray Lyman Wilbur, Jr., the Secretary's executive assistant, Northcutt Ely and Mrs. Ely, and Horace M. Albright, Director of the National Park Service.



THE MATCH

This curse of nature we all have seen:
A dark black blotch amid the green,
Tall black trees with limbs burned off,
A careless match and all was lost.
Each year we find another patch,
A monument to - the careless match.

- Lee Bushue
Mt. Brown Fire Lookout.

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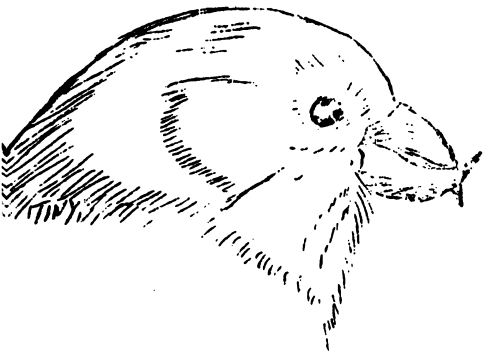
CROSSBILLS



Dr. G. C. Ruhle
Park Naturalist-

Throughout the long twilight of midsummer evenings, silhouetted against a roseate sky painted by rays from a setting sun long hidden behind the imposing summits of the Livingston Range, groups of small birds with strangely parrot-like behavior might be seen busily harvesting the cones of adjacent pine trees by visitors of Granite Park Chalets. Never moving about in the foliage to any marked extent, these tiny sparrows passed for the most part unobserved, unless one knew or was informed that they were gifted with a most remarkable adaptation for obtaining food, and even as they clung, upright or downward, to swinging cones, they plied their specialized mandibles with greatest dexterity.

Being primarily granivorous, members of the Fringillidae or Sparrow Family are characterized by unnotched coni-rostral bills, bills of a shape that combines delicacy of touch for securing minute objects with great firmness and strength for cracking seeds. The family is the largest and possibly the most important of North American birds. Moreover, members are found in almost every nook of the world except Australia, and in all types of habitats, - swamps and arid plains, grasslands, sand dunes, brushbelts and forests, mountain tops and Arctic wastes. As a rule, most are plainly clad, yet the family contains such members as the cardinal, the grosbeaks, and the vari-colored buntings. Many are sweet singers, while a few are among the greatest songsters, namely the purple finch, the fox sparrow, and the green-tailed towhee. The family not only includes birds commonly designated as sparrows (English, vesper, song, lark ...), but also the finches, buntings, linnets, grosbeaks, towhees, siskins, juncoes, crossbills, and domesticated canaries. The essentially living on seeds, these birds also eat buds, fruits, and insects. It is to be deplored that for the unknowing, a single exotic objectionable species, the rat of the bird class, has cast discredit on such a great family with so many members noted for beauty, utility, or sweetness of song; has added such bad flavor to the word "sparrow" to confound and cast doubt over the general desirability of innocents bearing this name.

Crossbills at birth have bills very much like other fringilline birds, but these develop with a most extraordinary lack of symmetry, the prolonged tips becoming curved so that they cross each other when closed. Nor is the beak alone unsymmetrical, but also the bony framework to which it is attached as well as the ligatures and muscles acting upon it. The unusual conformation is complete at maturity. It is with fitness that the bird should receive the scientific name Loxia, from the Greek, λοξός, loxos, "crooked".

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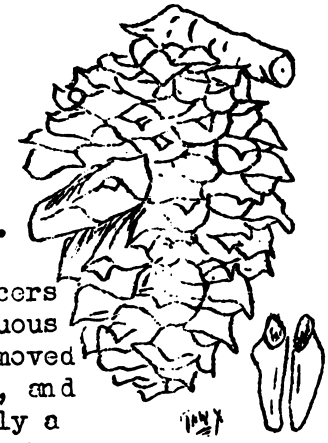

Crossbills forage largely in the tops of coniferous trees. By inserting their remarkable bill with its double leverage between the scales of pine cones, twisting the head to spread them apart, and scooping out the seed with their horny tongues, they are most proficient and speedy in husking pine cones. Their apparent deformity is a most convenient tool for cracking nuts, serving like a combination of pincers and scissors. It readily splits soft galls on deciduous trees, so that the larvae can be most dexterously removed by the tongue. Crossbills are fond of wooly aphides, and often cut tender buds or alder cones. Tho essentially a bird of the upper branches of conifers, they spend much time on wing, and often forage on the ground - but apparently never in intermediate growth.

The plumage of the American Crossbill is gray tinged with red, greenish or yellow. There is much variation, many males being dull red, brighter on the rump, while the female is olivaceous or even bright yellow. Young are streaked with olive-gray. There is much intergrading, and the red varies from yellowish orange to pure brick red. It was formerly supposed that males assumed more and more red with successive molts, but they are also suspected of losing the bright red plumage with age.

American Crossbills utter a low "pink-pink", which is usually two-syllabled. They are relatively unwary and eminently gregarious. They are of such irregular occurrence and show such a great propensity for wandering that it is impossible to predict with certainty their appearance at any one locality. They nest in any of the first nine months of the year, their homes being placed in forks or among the branches of trees. They are constructed of twigs or bark strips and lined with softer material.

A second crossbill, the white winged (L. leucoptera) has been seen in the Park. It has a weaker, higher pitched call generally of more than two syllables, and white wing bars which are absent on the American. It is often found associated with its generic relative, from which it can be distinguished only at close range.

There is an interesting myth connected with the Crossbill which serves to further increase our interest in this bird. It is said that when Christ was crucified this little bird tried to pull the nails from the cross, and in doing so, bent its bill tips until they crossed, and splashed blood all over its shoulders and back. It has sometimes been referred to as the Crucifixion Bird.

In our great coniferous forests, the eating of pine seeds is of no economic importance, and is more than balanced by the numbers of insects which Crossbills destroy. Moreover, the presence of this interesting bird at a time of the year when bird life is scarce makes it more than worthy of the protection which is everywhere afforded it.

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GLACIAL DRIFT

A page from the naturalist's diary - Schiller's William Tell says that he enjoys life to the fullest extent only if it is a constant state of change. He might find the kaleidscopic change he yearns for in the summer life of a ranger naturalist. Here is a sketch of variety and thrill from the leaves of the naturalist's diary: " . . . . . conducted Nature party from Going-to-the-Sun to Sperry, stopping for an hour at Lake Ellen Wilson to fish. After dinner delivered two lectures of one hour's duration each, subjects being "The American Indian" and "Park Animals". By request told story of Chief Joseph and his Nez Perce Indians. 9:30 P. M. - ran down from Sperry to Lewis' in sixty-two minutes (distance, seven miles; descent 3400 feet). Ranger ---------- met me in Chevrolet. Brakes locked as we were rounding turn, car skidded in loose gravel and turned over. No one hurt, damage slight. Headquarters at 11:30 P. M. Worked on reports until 3:00 A. M. Couldn't sleep, because of pain in lacerated finger. Arose at 6:00; left Lewis' at 7:00 and climbed to Sperry in ninety-five minutes. Party left Sperry for Glacier at 9:00; left at 10:30 and caught up with them in one hour. Conducted them over glacier, and on suggestion, took six of the members to the summit of Gunsight Mountain.* Got back to the chalet at 6:00. After dinner gave lecture on Conservation. Tried to help make campfire entertainment a success. 11:00 P. M. - nothing to do but go to bed, so turned in".

* See "Dejection", NATURE NOTES, page 30, for another incident connected with this ascent.

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of Glacier National Park and Vicinity

10. THE GARDEN WALL -

In the early nineties, Dr. George Bird Grinnell and party were camped at Grinnell Lake, then not named. Members of the party were singing one of the songs of that time, entitled "Over the Garden Wall". "Well," said one of the party, "here is one wall we cannot get over". It was then and there called "The Garden Wall".

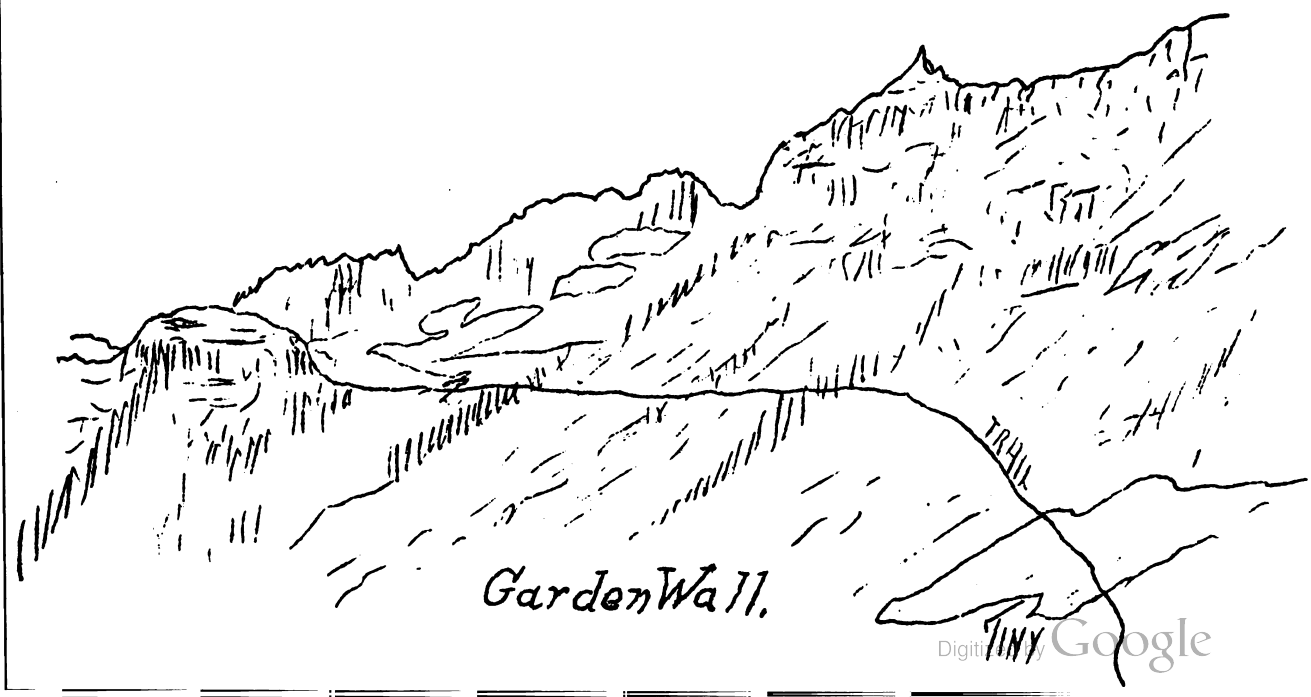
M. J. Elrod -

* * * * *

Last month a list of Recent Place Name Decisions of the Geographic Board were printed in NATURE NOTES. Because of space shortage the following were omitted:

11. TINKHAM MOUNTAIN (8,400 feet) is named for Lieutenant A. W. Tinkham, an Army engineer with Governor Isaac I. Stevens' exploration party of 1853. In October, Tinkham left the party south of Flathead Lake to explore the country to the north. He ascended the Middle Fork of the Flathead River and Nyack Creek, camped near Cut Bank Pass on October 19, and descended Cut Bank Creek en route to Fort Benton on the Missouri. So far as is known, Tinkham was the first white man to cross the Continental Divide within the present park. Tinkham Mountain is near the engineer's campsite, and is about two miles northwest of Flinsch Peak, visible from Two Medicine Chalet. It was formerly known as the Camels Hump.

12. WHITE QUIVER Falls is the new name given to Washboard Falls just above Glenna Lake on the Middle Fork of the Belly River.



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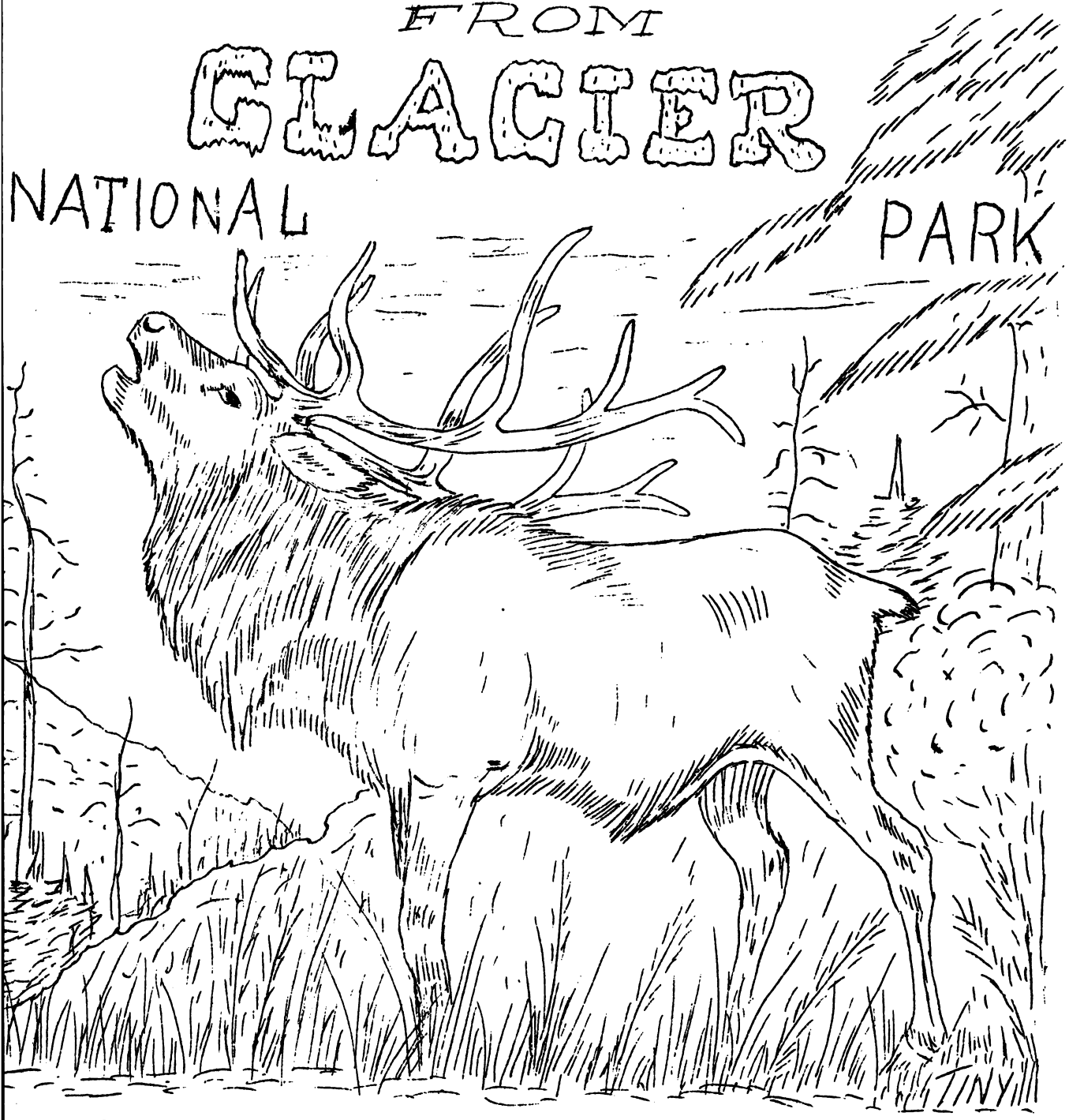

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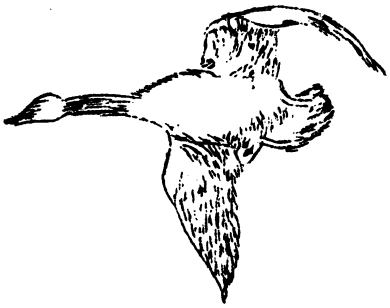

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
GLACIER NATIONAL PARK

NATURE NOTES FROM GLACIER NATIONAL PARK

Volume II October, 1929 Number 5

A monthly pamphlet edited by the park naturalist and distributed by the Educational Division of Glacier National Park to all interested in the Park and its natural history.

J. Ross Eakin, Park Superintendent Dr. G.C. Ruhle, Park Naturalist

"NATURE IS MORE THAN TRUTH, IT IS BEAUTY AS WELL."

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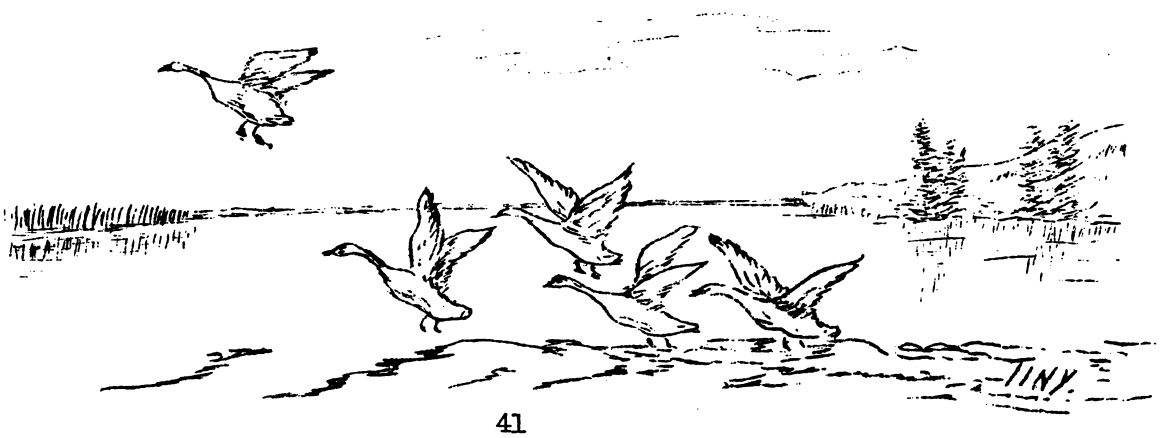

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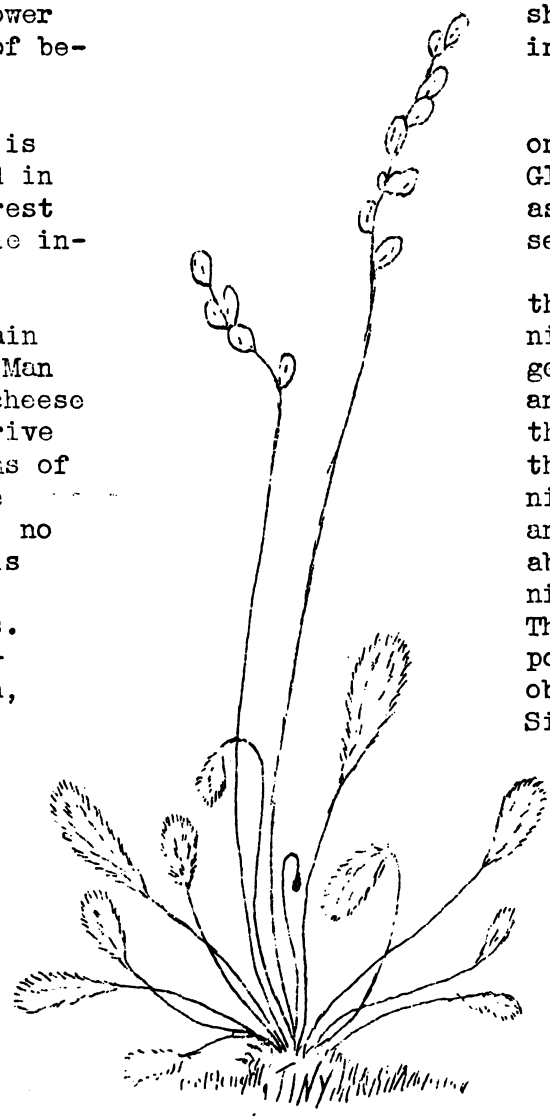
THE SUNDEW

A Glacier Park Plant That Catches Insects.
Millard E. Peterson, Ranger Naturalist

"The Ranger Naturalist will give a short talk on the Sundew, a plant that eats insects in the lobby tonight."

This sounds as if it were taken from the lips of a side show barker, but in reality it is a sentence placed on the dinner menu of Lewis' Glacier Hotel announcing the evening lecture. Much merriment was afforded the guests as they read this badly constructed sentence. Nevertheless, even as it stood, it was in the main correct, for a few flies and gnats had been enveloped by the plants in the lobby flower show and were even then in the process of being digested, eaten, if you please.



The Sundew is one of the many interesting plants found in Glacier Park and is of particular interest as it secures part of its food from the insects it catches.

All living things must have food containing certain nitrogen compounds in order to grow. Man gets his from meats, butter, beans, cheese and many other foods. Green plants derive theirs from the soil. The three fourths of the air we breathe is composed of free nitrogen, we can utilize only the oxygen, no animal being capable of assimilating this abundant supply. Neither is free nitrogen available to any green plants. The latter get their nitrogen in compound form from the soil; animals, in turn, obtain theirs from the plants they eat. Since plants are continually using the available nitrogen of the soil, that element is soon depleted unless replaced by some means or other. Consequently, when we grow crops, we replace this by adding a nitrogenous fertilizer.

We might think that it seems too bad that the abundant supply of nitrogen in the air cannot be used. If so, we are mistaken, for there are certain colorless, one-celled plants called bacteria that can absorb free nitrogen and convert it into nitrogen compounds that can be used by other plants. These "nitrogen fixing bacteria" live on the roots of members of the legume family (alfalfa, clover, beans, peas).

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As they continue to live here they gather this free nitrogen and store it in "nodules" on the roots of the legume. Later the nodules decay and the nitrogen compounds are released so that other plants may use it.

The Sundew has adapted itself to living in places where there is very little compound nitrogen in the soil. Since nitrogen is necessary for its life, it secures its supply from the bodies of insects. The leaves of this plant are covered with tiny hair like processes, each of which is capped with a drop of honey like substance that glistens in the sunlight - hence the name: Sundew. Insects are lured and retained by this sticky substance and while the victim struggles to free himself other "honey-dew" laden "hairs" bend over, clasp, completely envelop, and soon smother it to death. Certain juices are secreted by these hairs which digest the prey so that it can be used by the plant. When the digestion has completed the ensnaring hairs bend back and permit the remains to be blown away.

The question in most people's minds at this point is: does the plant have voluntary control over these ensnaring hairs"? Some credit the plant with a highly developed nervous system but most believe that the process is a mechanical one. We have all noticed that plants bend toward the sun. One of the factors causing this movement is the loss of water from the cells on the exposed side, causing those cells to shrink and allowing the plant to bend in that direction. Possibly a chemical substance given off by the insect causes a shrinkage of the cells closest to the insect thus making the hairs bend in that direction.

The Sundew is a very small plant with long-stemmed, round leaves lying close to or upon the ground. Not only the leaves, but also the leaf stems are covered with the long, fine, red filaments or "hairs" described above. The red flower stem is erect, smooth, and bears a one sided cluster of four to six tiny white flowers that open one at a time in the sunshine. Sundew sap stains paper a ruddy madder purple.

The Sundew is extensively distributed over the Northern Temperate zone in bogs and marshes. Darwin and other famous naturalists have spent many hours of study over this interesting, innocent looking plant which has developed such unplantlike blood-thirsty habits. It has even been suggested that it might be cultivated as a house or garden plant to capture flies and mosquitoes.

If you are planning a trip to Glacier Park and have not already become acquainted with this plant it will be worth your while to look for it in the sphagnum bogs of John's Lake or Fish Lake in the Lake McDonald region of the Park.

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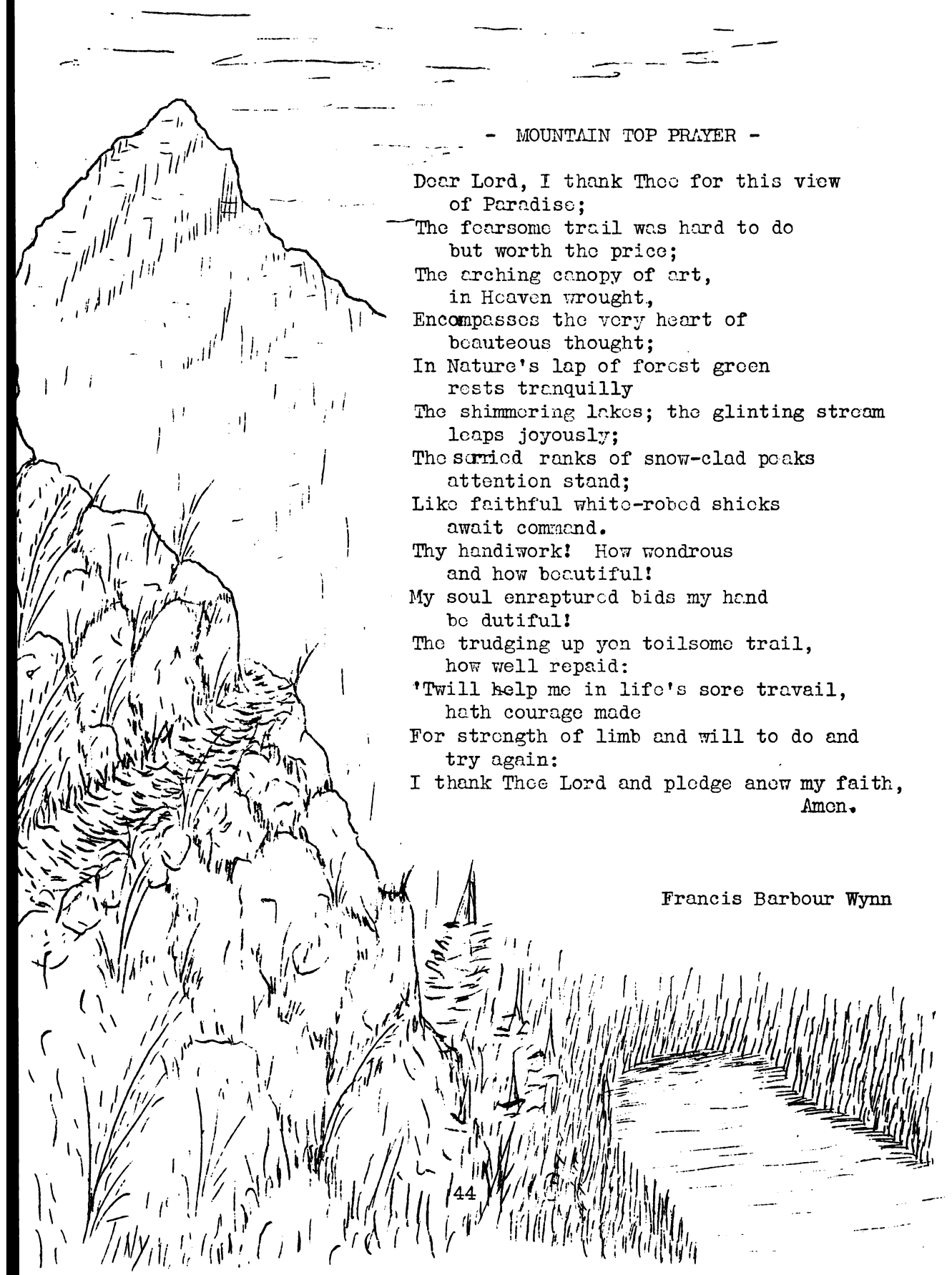

- MOUNTAIN TOP PRAYER -

Dear Lord, I thank Thee for this view
of Paradise;
The fearsome trail was hard to do
but worth the price;
The arching canopy of art,
in Heaven wrought,
Encompasses the very heart of
beauteous thought;
In Nature's lap of forest green
rests tranquilly
The shimmering lakes; the glinting stream
leaps joyously;
The serried ranks of snow-clad peaks
attention stand;
Like faithful white-robed shicks
await command.
Thy handiwork! How wondrous
and how beautiful!
My soul enraptured bids my hand
be dutiful!
The trudging up yon toilsome trail,
how well repaid:
'Twill help me in life's sore travail,
hath courage made
For strength of limb and will to do and
try again:
I thank Thee Lord and pledge anew my faith,
Amen.

Francis Barbour Wynn

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Wanderings Afoot in Glacier Park: Montana

Norman Clyde

Perhaps no region in the American continent surpasses Glacier Park, Montana, in rugged and picturesque scenery. Others may possess loftier mountains, broader valleys, nobler forests, but one would search in vain for one of equal area containing so many mountains of bold, striking forms, such an abundance of profound cirques, so great a number of beautiful lakes. With the purpose of remaining for some time in this interesting region, I arrived at the southeastern extremity of the park about the middle of July. In order to obtain a comprehensive view of the country which I hoped to traverse I climbed Mt. Henry not far from the southeastern border of the park. The panorama seen from its summit was extremely inspiring. Northwestward to the Canadian border a distance of about fifty miles in an airline extend the crests of two parallel ranges of mountains--the Lewis and the Livingstone. They are not unusually lofty as the highest peak rises less than 11,000 feet above sea-level, but are exceedingly rugged and striking, being carved into a great variety of bold and beautiful forms of many-hued limestone and argillite. Cirques cut deeply into them, glaciers hang on their eastern and northern slopes, deep valleys intersect them, in which gleam numerous sapphire and turquoise lakes.

Some four thousand feet below the summit of Mt. Henry and to the northwest, lies Two Medicine Lake. Thither I directed my course. The trail was soon gained and as lower elevations were reached there was a continuous succession of beautiful and striking views both of the lovely lake and of the mountains that rise steeply around it. North of it is the ponderous bulk of Rising Wolf Mt. with great areas of deep red argillite showing on its precipitous flank. West of it towers Mt. Rockwell, extending toward the lake a pyramidal spur of remarkable beauty of outline. Other scarcely less noteworthy peaks limit the view in every direction, except a narrow space opening toward the eastern plain. The lake is an azure expanse of limpid water several miles in length and surrounded by a dark border of coniferous forest. As I descended, its surface shone like polished silver in the rays of the afternoon sun. But when its border was reached shadows extended across it and Rising Wolf Mt. gleamed a deep vermilion in the evening light. During the ensuing days it was a delight to gaze upon it, ruffled by gentle breezes, rolling beneath the force of strong winds or scintillating in bright sunshine as its waves softly lapped the sandy shore. Seldom can a more enchanting spot be found than this exquisite lake surrounded by a magic circle of beautiful and imposing mountains.

Several days were spent in ascending nearby peaks. The first excursion of this character was up Paradise Creek toward Two Medicine Pass. The trail wound through alternate stretches of dense fir forest and open meadow. Great numbers of alpine flowers were encountered as timberline was approached. Of these masses of the yellow, waxen flowers

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of the glacier lily were especially attractive. At still greater elevations the eye was delighted by the fragile white flowers of the dryas and the tufted clusters of the purple silene clinging close to the green carpeted ground.

Having gained the pass I turned southward and ascended Grizzly Peak, 9,070 feet above sea-level. I was rewarded with a magnificent view, particularly of several of the great trough-like valleys that extend down the western flank of the range. On the other side of the pass, however, Mt. Rockwell rose with precipitous argillite walls and seemed to promise a finer prospect and a somewhat arduous ascent. After dropping down to the pass I swung around its shoulder and trudged up a steep slope covered with an open growth of fir trees. These became rapidly smaller as the altitude increased, and at length vanished entirely. Rugged cliffs and pinnacles towered a thousand feet higher. As it was late in the afternoon haste was imperative if the summit was to be gained and camp reached that evening. By ascending chimneys and scrambling from bench to bench of the horizontal strata of which the mountain is composed, the highest point was attained, perhaps for the first time by human foot. The prospect was superb. Westward were the spire-like forms of Mt. St. Nicholas and its scarcely less lofty companions. Beneath them nestled several turquoise lakes and past them swept a magnificent timber-clothed valley. To the northward there was a long array of lofty mountains, some white with glaciers clinging to their sides. Westward from them extended numerous deep, elongated valleys. Eastward and directly below were the Two Medicine Lakes, sheets of shining sapphire, and beyond them the massive form of Rising Wolf Mt.

As the sun was already low, I cast about for a way to descend, other than the one used in the ascent. The eastern face appeared to be feasible and was therefore selected, although there was a possibility of being blocked by difficulties not visible from the summit. This might compel one to spend the night on the mountainside. The descent was at first gentle, but soon I encountered a narrow wall separating two cirques whose glaciers had cut back toward each other until they almost met. However, a crossing was easily effected along shelves to a continuation of the mountain slope. The route then led down a long declivity of shale followed by extensive alpine meadows. These were sprinkled with flowers and numerous small, clear brooks meandered swiftly through them and cascaded down the escarpments that ran between the terrace-like levels of the basin. Dense thickets of low, matted spruce soon intervened and were succeded by a series of limestone ledges averaging a few hundred feet in height. These I descended without any especial difficulty and was soon standing on the meadowy margin of upper Two Medicine Lake. Glacier lilies grew in profusion in the grassy coves and recesses in which remnants of snow drifts still lingered. The lake was enveloped in shadow as were also the steep mountains beyond it, except their summits which were glowing in the amber-colored rays of the setting sun. As I proceeded down the border of the lake

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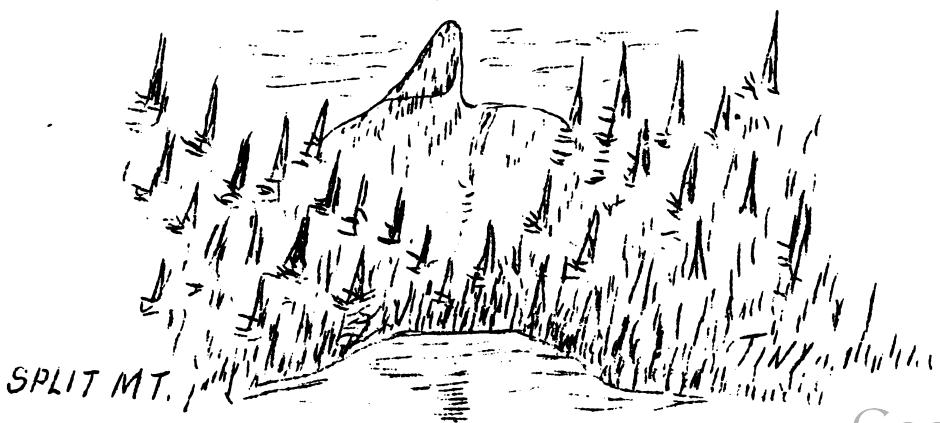
the color deepened on the summit of a peak at its upper end and several clouds that were floating about it, flushed rose and crimson. The whole scene was thrown into beautiful perspective by a foreground of darkly gleaming lake flanked by deeply shadowed cliffs.

Several stormy days followed. Clouds hung low over the mountains and the rain came driving across the lake. But the wonderful weather that succeeded made ample compensation for these dismal days. At sunrise and sunset Mt. Rockwell and Rising Wolf Mt. glowed vermilion and the clouds that hovered about their summits were transfused with rose and crimson hues. At night the moonlight shown on Mt. Rockwell. It gleamed, and scintillated on Two Medicine Lake in which the reflections of the surrounding mountains appeared and disappeared as its surface was placid or ruffled by a passing breeze. During the day Mt. Rockwell towered aloft in a cerulean sky, across the azure expanse of the forest-girdled lake or was crowned with fleecy, white clouds that paused for a while around its summit as they floated leisurely past through the blue empyrean.

After climbing a number of the nearby mountains, I reluctantly withdrew from this charming region. St. Mary Lake was the next objective. For days I followed the Cut Bank Trail. From the summit of Morgan Mt., Triple Divide Peak and Norris Mt. sublime panoramas were beheld. From all of them there were impressive views down into the verdant depth of the valley of Nyack Creek; across it to Stimson Peak, 10,155 feet in elevation and along it, to the glacier-mantled peaks, Mt. Logan, Blackfeet Mt. and Mt. Jackson. Delightfully situated camps were selected both nights. The first was in a small, sheltered basin covered with coarse grass and matted alpine fir. To the southwest it commanded an extensive outlook. A brook hurried past and plunged over a series of ledges. A thousand feet below, a dark blue lake lay deeply esconced in a bowl-shaped, forest-clad valley. On either side steep mountains rose to a considerable height. The muffled sounds of cataracts falling from the cliffs below seemed to accentuate the wildness of the scene and as night enveloped the mountains, they seemed to resound more loudly. The other camp, was on the bank of the Hudson Bay Creek, deeply buried in dense forest. The stream rushed past beneath a canopy of overhanging trees. The view was cut off in every direction except to the southwest, where up the valley and through an opening, Split Mt. rose to a great elevation and glowed through a diaphanous haze, showing in fine perspective up the dark, forested valley.



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GLACIER DRIFT

Time for Seeing Animals - Visitors in Glacier Park during September were most fortunate in seeing many park animals. Especially was this true for visitors at Many Glacier. Mountain goats were daily visible in numbers on the south facing slopes of Grinnell Mountain. The mountain sheep that live on Altyn came down to the Cache's early in the month. Wolves were reported seen by several horseback parties both on Piegan Pass and Swiftcurrent Pass trails. Crossfoxes were seen by a score of horseback parties on Cracker Lake Trail. Beaver were present in Swiftcurrent Lake, while mule deer and bear, both black and grizzly, were present in unusually plentiful numbers. Among birds, various waterfowl were seen in increasing numbers.

Mountain Sheep for Breakfast - Guests at Many Glacier Hotel during the closing weeks of the season were treated with rare sights of mountain sheep cavorting on the slopes of Altyn Peak during morning hours. Guests were seated at breakfast in front of windows through which they might watch these animals within reach of the naked eye.

Petting Mountain Sheep - As the month advanced, not only did the number of sheep at lower elevations increase, but individuals became more and more accustomed to the close approach of human beings. During the best week of the month, delegates en route to the American Bankers' Convention at San Francisco saw more than a half hundred sheep at close range. These sheep were very tame, yearlings even permitting the financiers to stroke them while they greedily licked the rock salt blocks that had been placed there for them. Meanwhile cameras clicked and hundreds of feet of movie film were busily recording the unusual unwariness of these animals. - G.C.R.

Fishing For the Future - The 250 lakes and numerous streams in Glacier National Park now provide excellent fishing, but plans are being carried out to provide sport for the tremendous influx of people who will visit this great playground in future years. This year at the Glacier Park hatchery located near Glacier Park Hotel, eight rearing ponds have been constructed in which 2,000,000 trout can be reared to fingerling size. Next year a hatchery also with eight rearing ponds will be constructed at Fish Creek west of the Continental Divide to take care of 2,000,000 additional fingerling trout which can be liberated in fall before the freezeup.

Mr. Fred J. Foster has been detailed by the U.S. Bureau of Fisheries as Fish Culturist for all national parks. Previously the work in Glacier Park was supervised by W.T. Thompson of Bozeman Station, U.S. Bureau of Fisheries Mr. Foster can now devote his entire time to fish culture in the parks and Mr. Thompson will collaborate with him. Policies evolved by Mr. Thompson will be continued but stocking of waters will be more intensive.

Travel During the 1929 Season - The total number of visitors entering Glacier Park this year was 70,742, an increase of 32.3% over the total (53,454) for the 1928 season. - J.R. Eakin.

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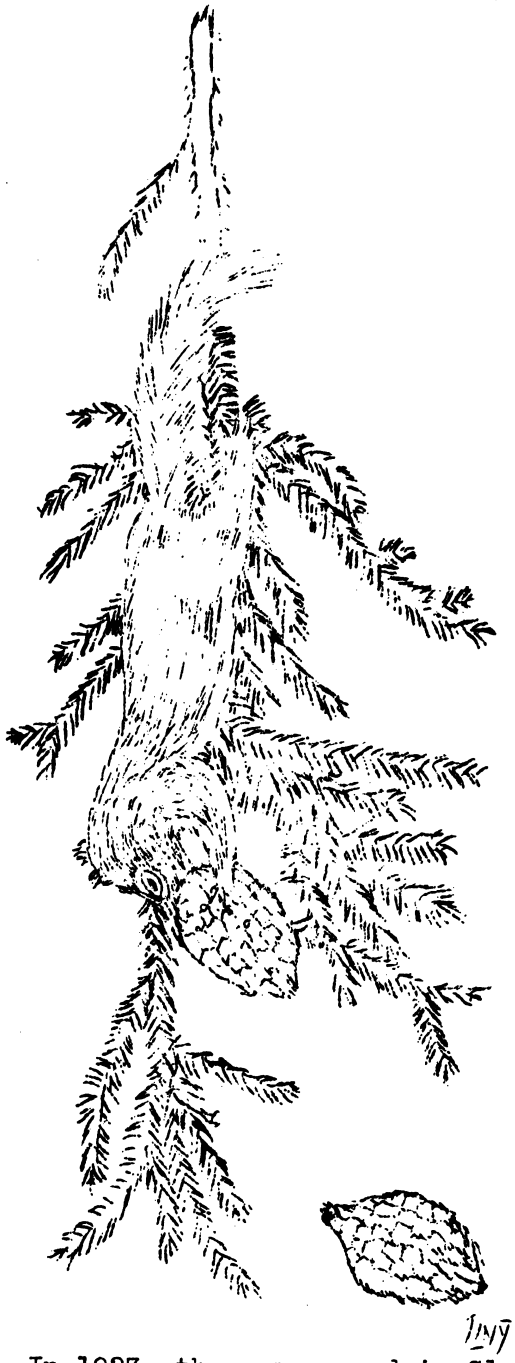

Authors of October Articles - On a quiet September afternoon, Coburn D. Hollister of Schnectady, N.Y., Leo Sœthaler Alpine guide extraordinary who guided hundreds of people over treacherous glacial ice during the past season, and the park naturalist made an ascent of the pyramidal Grinnell Mountain in the Many Glacier Region. Upon the summit, buried beneath a lofty cairn of rocks, they found a metal box containing a register for successful climbers. Within the booklet, they read that the register had been placed by the Nature Study Club of Indiana whose mission was "to discover to the people of Indiana the beauty of the out-doors". It had been carried to the summit on August 12, 1919, by Mr. Wynn, D.B. Clapp of Scipio, Indiana and Sidney F. Daily of Indianapolis. Other names on the register were those of Norman Clyde of San Francisco, who registered on August 18, 1923, Lee L. Stoffle of San Francisco, Fred Herz of Reno, Nevada and Norman Clyde who made an ascent on August 1, 1924. No others were included. The three hikers registered Leo adding after his name "den Schweizer und Dolomiter Alpen Bergfuhrer von Many Glacier". In the register, the beautiful poem found on page 14 was written by Mr. Wynn. This, the park naturalist copied and has brought to you through the medium of NATURE NOTES. Francis Barbour Wynn was a scientist, physicist, mountain climber and lover of Glacier National Park. He was killed on July 27, 1924 while attempting to climb Mt. Siyeh. The northern spur of Siyeh, formerly called Point Mountain, has been renamed Wynn Mountain in his memory.

In 1923, there appeared in Glacier Park a man whose name had long been associated in Res Californiana with daring mountain climbing, with remarkable vigor and endurance. Within five or six weeks he had scaled thirty-seven Glacier peaks of elevations above 8000 feet from Mt. Henry on the south to Henkel and Altyn on the north. Returning in 1924 with the Sierra Club of California, he scaled twenty two more in the northern half of the park. A big event in the history of any mountain is the first ascent, and many of his climbs are characterized as such. Mr. Norman Clyde of California tells you in his own words some of the thrills of climbing Glacier Mountains.

Millard E. Peterson who wrote the fascinating article on the Sundew is a summer ranger naturalist stationed at Lewis' Glacier Hotel(See page 27 of NATURE NOTES).

G.C.R.

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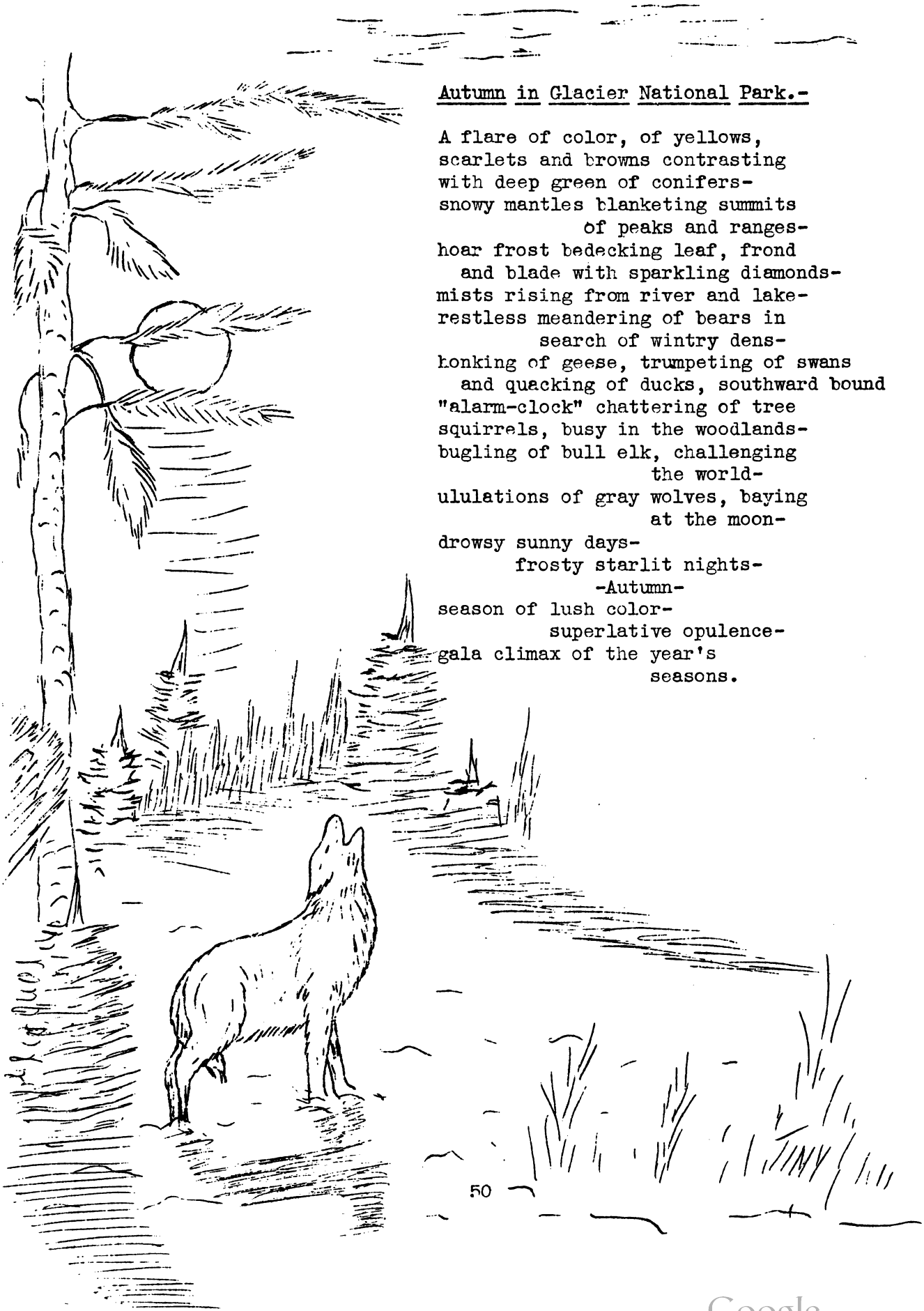

Autumn in Glacier National Park.-

A flare of color, of yellows,
scarlets and browns contrasting
with deep green of conifers-
snowy mantles blanketing summits
of peaks and ranges-
hoar frost bedecking leaf, frond
and blade with sparkling diamonds-
mists rising from river and lake-
restless meandering of bears in
search of wintry dens-
honking of geese, trumpeting of swans
and quacking of ducks, southward bound
"alarm-clock" chattering of tree
squirrels, busy in the woodlands-
bugling of bull elk, challenging
the world-
ululations of gray wolves, baying
at the moon-
drowsy sunny days-
frosty starlit nights-
-Autumn-
season of lush color-
superlative opulence-
gala climax of the year's
seasons.

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PLACE NAMES
of Glacier National Park and Vicinity

13. WATERTON RIVER rises on the northern slopes of Trapper Peak in the north central portion of the park. It flows northerly thru Waterton Lake into the Belly River. Until March 6 of this year the headwaters of the river, south of Waterton Lake, was called Little Kootenai Creek, but the United States Board of Geographic Names altered this to conform to the name of the outlet of the lake. Waterton Valley thru which the headwaters flow is famous for its many beaver dams.

In 1857-1860, Captain John Palliser (1817-1887) commanded an expedition sent out by the Imperial Government to explore the country between the forty-ninth parallel, the North Saskatchewan, the Red River and the Rockies, and to ascertain whether there was a feasible route for a railway south of Athabasca Pass. Lieutenant Thomas Blakiston, R.A., attached to this Expedition as magnetic observer, prepared a map in 1858 in an independent report which showed Waterton Lake, presumably named by him for Charles Waterton, naturalist (1782-1865) and author of "Wanderings in South America, the North West of the United States and the Antilles in 1812, 1816, 1820 and 1824".

The map prepared by the Pacific Railroad Exploration Party of the fifties well illustrates the haziness of their knowledge of the country in the northern Rockies. They ignored James Doty's careful observations, took Blakiston's lake on the International Boundary and Doty's Chief Mountain Lake (Lower St. Mary Lake of today) to be identical, placed a lake across the boundary, and dubbed it Chief Mountain Lake, a name wholly inapplicable to Waterton Lake since Chief Mountain is well hidden from view, not only from the Lake but its headwaters as well, by the highest summits of the adjacent mountains. (See NATURE NOTES , II, page 23). The International Boundary Survey of 1878 correctly located Waterton Lake and called it Chief Mountain Lake. Its outlet was correctly called Waterton River.

WATERTON LAKE. FROM LOBBY OF PRINCE OF WALES HOTEL

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NATURE NOTES FROM GLACIER NATIONAL PARK

1929

NOVEMBER

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UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
GLACIER NATIONAL PARK

NATURE NOTES FROM GLACIER NATIONAL PARK

Volume II November, 1929 Number 6

A monthly pamphlet edited by the park naturalist and distributed by the Educational Division of Glacier National Park to all interested in the Park and its natural history.

J. Ross Eakin, Park Superintendent Dr. G.C. Ruhle, Park Naturalist

"NATURE IS MORE THAN TRUTH, IT IS BEAUTY AS WELL."

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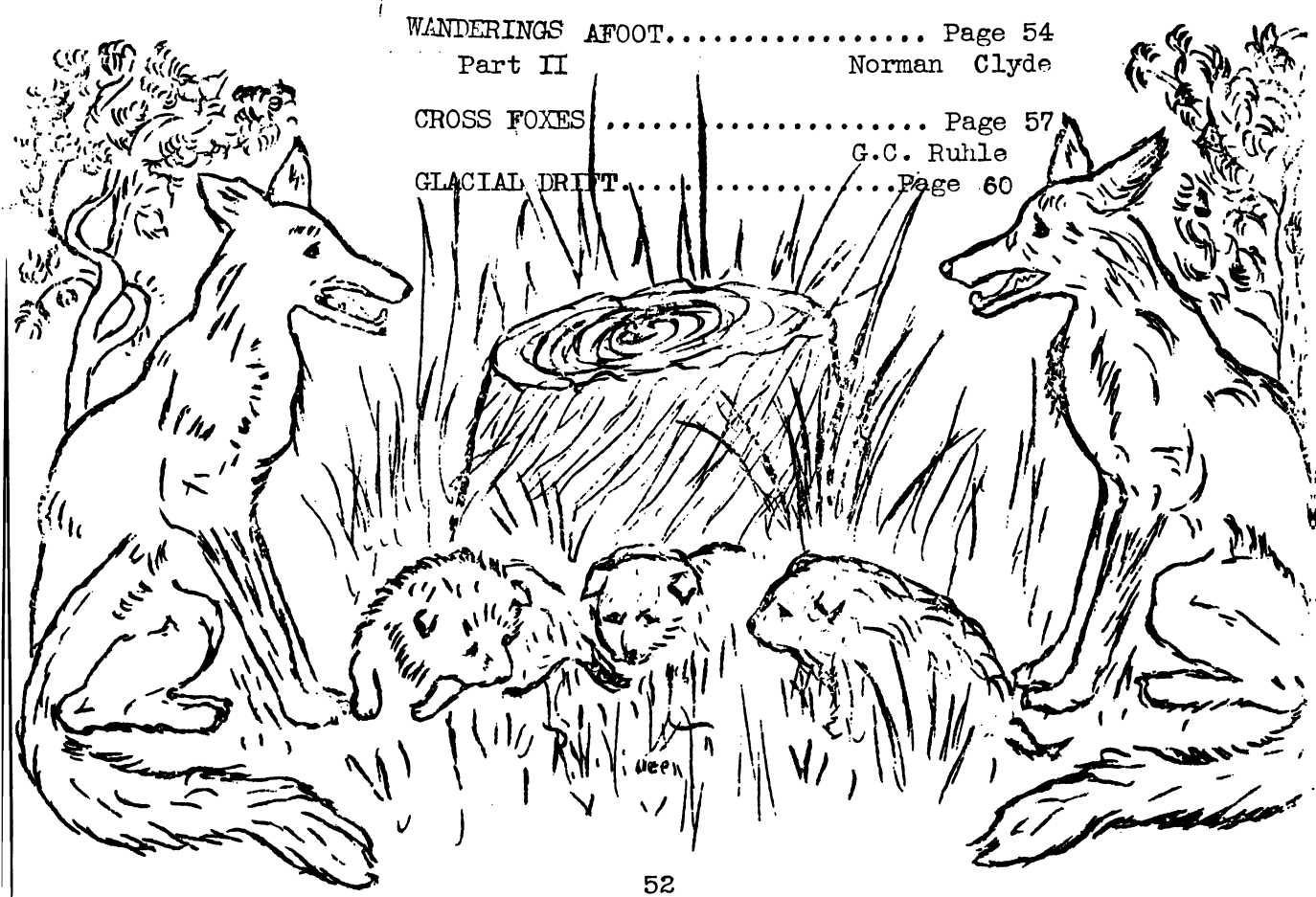

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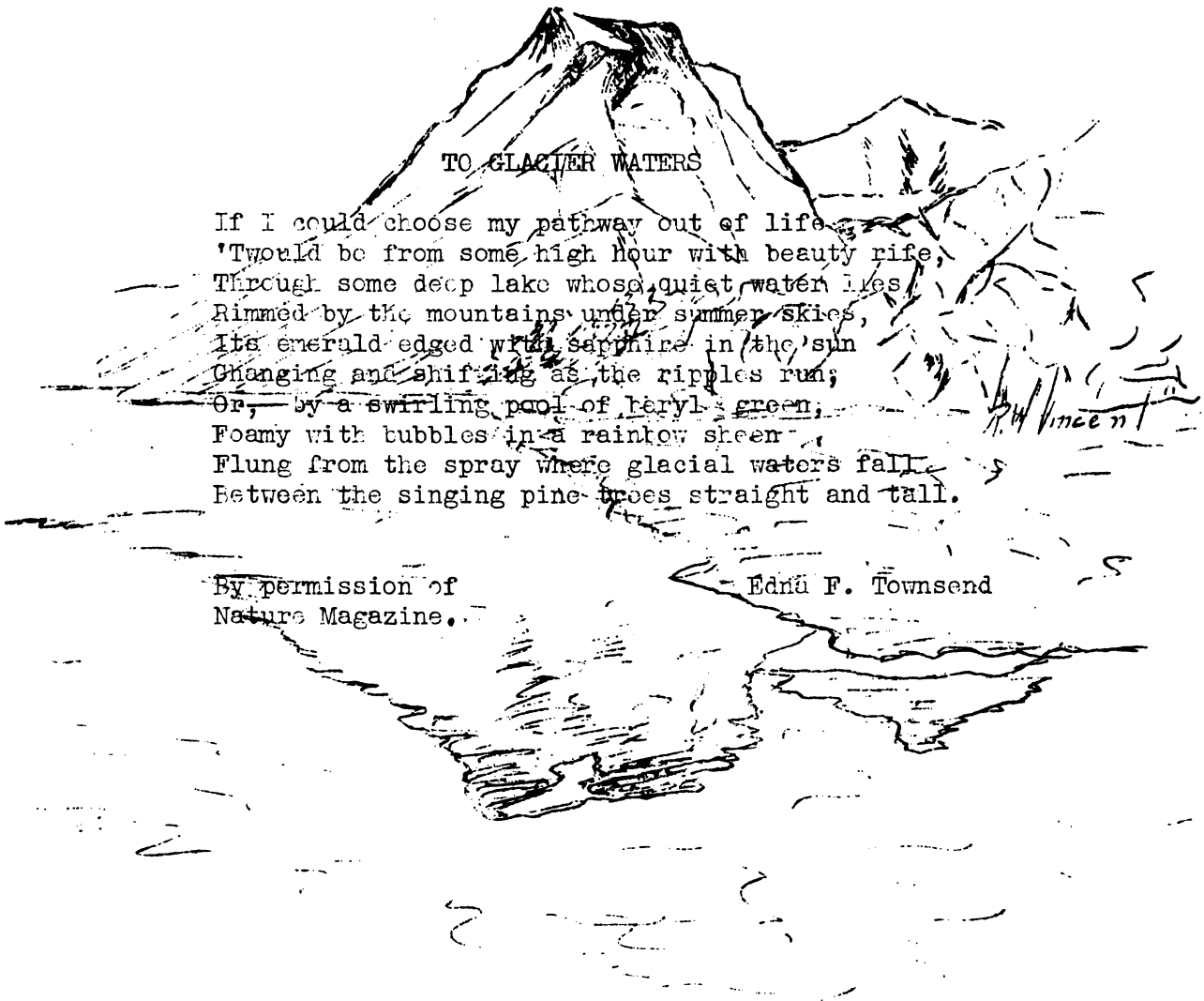

TO GLACIER WATERS

If I could choose my pathway out of life,
'Twould be from some high hour with beauty rife,
Through some deep lake whose quiet water lies
Rimmed by the mountains under summer skies,
Its emerald edged with sapphire in the sun
Changing and shifting as the ripples run;
Or, by a swirling pool of beryl green,
Foamy with bubbles in a rainbow sheen
Flung from the spray where glacial waters fall
Between the singing pine trees straight and tall.

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Nature Magazine.

Edna F. Townsend

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On the third day I abandoned the Cut Bank Trail and followed a dim, unused one up Red Eagle Creek toward its source. This beautiful, turquoise hued stream winds trhough a heavy forest of fir and spruce. The trail was overgrown with shrubs and tall herbs, and numerous trees had fallen across it. Evidently it had been used but little for years. Here and there were foot-prints of elk and also those of a large bear that had recently passed along it. Several miles upstream the first meadows were encountered. The trail seemed to vanish in the marsh and the willows with which they were overgrown, but after fording a stream several feet in depth, it was found in the forest, a short distance above. It became somewhat monotonous as it wound along mile after mile through the heavy stand of fir, when suddenly it emerged from it and a scene of startling beauty came suddenly into view. Directly ahead was a meadowy expanse bounded by a cirque wall hundreds of feet in height over which a snow white cascade dashed and the melodious sound of its falling water was wafted through the verdant solitude. The scene was a sequestered one of rare charm: the forest below, cliff and crag above, while roundabout were flowery meadow and willowy marsh.

After stopping for a short time in a luxuriant meadow surrounded by beautiful, spiry spruce trees standing singly and in small groups, I continued on my way up a badly overgrown trail that zigzagged up a steep slope until it finally surmounted a limestone cliff. Here, on the rim of the upper cirque, the outlook was broad and inspiring. Five hundred feet below was the broad, heavily verdured floor of the lower cirque. Swinging around it in a great horseshoe were cliffs of limestone and argillite, from which rose many rugged peaks. The most conspicuous of these was Split Mountain with an almost vertical face and narrow truncated summit. In the upper cirque, gently sloping meadows, clothed with grass and sprinkled with alpine flowers, undulated upward toward crags and peaks at its head. As it was growing late I pressed on toward Red Eagle Glacier. After travelling for some time, I came to some exquisite meadows a short distance below the glacier where flowers of unusual delicacy and beauty of tinting grew in profusion. The castilleia, the wild heliotrope, the bryanthus, the cassiope and the anemone adorned the green sward with a wealth of delicate blossoms. Many small brooks glided through the meadows, some clear as crystal, some milky white from glacial flour. Dwarfed and twisted growths of alpine fir and spruce clothed scattered hillocks of morainal material. Almost the only sounds heard were those of streams falling over the ledges below and occasionally a sharp crack from the glacier a short distance above. The upper cirque was soon enveloped in deep shadow, but Split Mountain and neighboring peaks glowed with a brilliance that gradually deepened as the sun went down, and then faded into darkness.

Camp was made on the lee of a mound clad with a thick growth of fir. As I was lounging beside the dying embers of a small fire a short time after sunset, I heard a slight sound and upon turning my head, saw a flock of wild goats deploying around the hillock. There were a dozen of them;

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old females rendered unusually grotesque by the dangling masses of wool that hung from them in long dishevelled shreds; slighter, trimmer females and young, frolicsome kids. They continued to come toward me gazing at me in a mystified but unalarmed manner, until some of them were only a few yards away. As I rose to my knees to photograph them, they became suddenly frightened and hurriedly loped away in their ungainly fashion, to some nearby ledges from which they peered down with amusing curiosity.

On the following day I contemplated an ascent of one or more of the neighboring peaks. Mt. Logan, the highest of those at the head of the cirque, appeared to be unscalable from its nearer side. Immediately to the west of it is an unnamed mountain that forms a striking pyramid. By crossing a small glacier and scaling a broken portion of the cliff I gained the saddle between the two mountains. From there I easily made the ascent without incident except that several wild goats scrambled along the ledges, dislodging miniature avalanches of stones as they did so. Although the peak was relatively low, it commanded a superb panorama. Thousands of feet below lay Nyack Creek with its great trough-shaped valley. Across it the lofty and striking form of Mt. Stimson, its rocky summit projecting far above the green mantle of evergreens that clothe its lower slopes, rose six thousand feet above the floor of the valley. Still more impressive was Blackfeet Mountain, its dark summit protruded from a white robe of glaciers from which numerous milky streams cascaded down the walls of a great cirque to the verdant valley several thousand feet below. After enjoying the view for some time I descended to the saddle and there climbed a chimney leading to the crest of the main ridge of Mt. Logan. This I followed to the summit. There an immense panorama extended in every direction. Sublimely rugged and awe-inspiring was the long array of peak after peak along the main axes of the range. Especially imposing were the towering summits of Blackfeet Mountain and Mt. Jackson with their girdle of gleaming glaciers. The sky was a deep blue and bright sunshine bathed the mountains. Silence pervaded the atmosphere except for the sound of cascades dashing down cliffs and now and then a piercing report from a rending glacier.

In the descent I followed a winding course eastward around the mountain, keeping to the ridge that led toward Blackfeet Glacier. A pair of mountain sheep bounded ahead occasionally stopping to look back. Before proceeding far, I swerved to the right, climbed down a rather precipitous cliff, glissaded across a steep portion of the glacier and then climbed to a pass above camp. The cliff below was perpendicular but I knew that somewhere along it there was a chimney that could be de-

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scended. Although the sun was already low, Almost-A-Dog Mountain rose to the left of the pass and the opportunity for another scramble proved too alluring to resist. While approaching the summit I encountered several embarrassing places on the narrow shelves along the side of the mountain. On account of the shaly character of the rock a rope was useless and a single slip would probably have resulted in a plunge of a thousand feet. Eventually I came to a great gash in the ridge. The highest point of the mountain was beyond it. As it seemed impossible to circumvent it at that time of day I reluctantly retraced my steps. A magnificent bighorn leaped up nearby, stood for a few moments silhouetted against the evening sky and then bounded down the mountainside. Upon reaching the chimney above camp again, after a short search I discovered a negotiable chimney, descended it, and hastened across the meadows, reaching camp as night settled down over the mountains.

The next morning I approached Almost-A-Dog Mountain from another angle. Upon nearing the summit, a storm seemed imminent, but unwilling to be disappointed again I sprang from shelf to shelf and soon reached it--a narrow ragged ridge about forty yards in length. Storm clouds were hurrying in various directions, one apparently bearing directly toward the peak on which I was standing. I therefore, hastily threw up a cairn and was soon on my way down to the saddle east of the mountain. However, the storm passed by and continuing along the ridge I reached Little Chief Mountain and ascended it. The view obtained was an enthralling one. Five thousand feet below lay the beautiful Lake St. Mary, surrounded by mountains both picturesque in form and fascinating in color. The eye was delighted by the bold outline of Going-to-the-Sun Mountain, standing out like the prow of a great battleship, directly across the lake; the spire-like peaks of Fusilade and Reynolds Mountains along the main crest; the stalwart form of Citadel Mountain tapering gradually to a narrow, flat top, and numerous others scarcely less striking. The red and green hues of the argillite, the gray and buff tones of the limestone; the white of the hanging glaciers; the turquoise shades of the expanse of the lake and the deep green of the coniferous forest that densely clothed all the lower levels, formed a color symphony of wonderful beauty.

Evening found me again in camp.

To be Continued.

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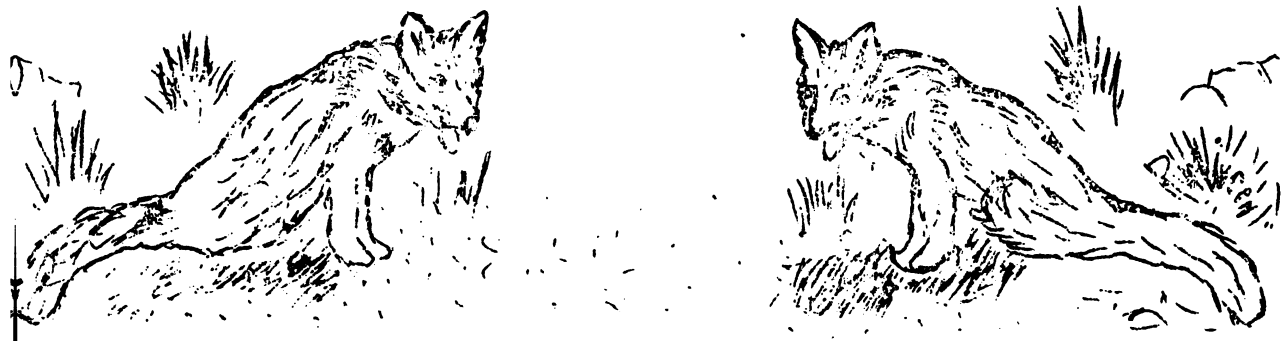
GLACIER NATURE NOTES

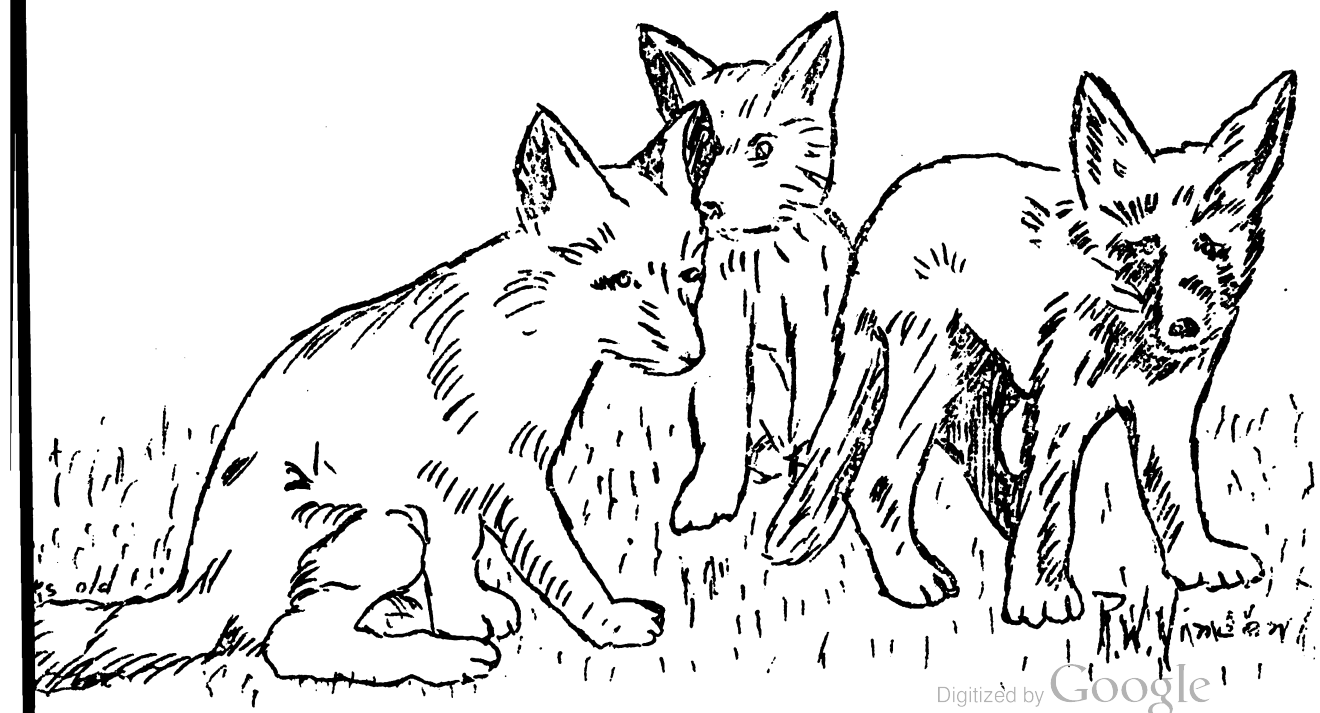
CROSS FOXES

G.C. Ruhle
Park Naturalist



During September horseback parties to Cracker Lake repeatedly brought back to Many Glacier Hotel tales of two curious foxes that had inspected their passing with great interest from a point of vantage near a bend in the trail. Keen had been the enthusiasm of those fortunate enough to behold these rather common but very shy inhabitants of Glacier Park, a keenness sharpened by the fact that they so seldom permit themselves to be visible to the passerby. The naturalist was thoroughly questioned: "What kind of foxes were these?" "On what do foxes live?" "Are foxes really so cunning?" None of these parties had had a resident naturalist with them, but had one been present, they might have been told something about foxes in the following fashion. Investigation proved this pair to be cross foxes.

The fox is characterized by slight build, a long bushy tail, short limbs, large triangular ears, oblique eyes. The common or red fox (Canis fulvus) is usually of a reddish yellow color with the throat and underparts more or less white, hinder parts of back grizzled, and tail, except for the white extremity, with black-tipped red hairs. The American fox is larger, handsomer than the common fox of Europe, the famous Reynard of folk-lore and fable, and has some-



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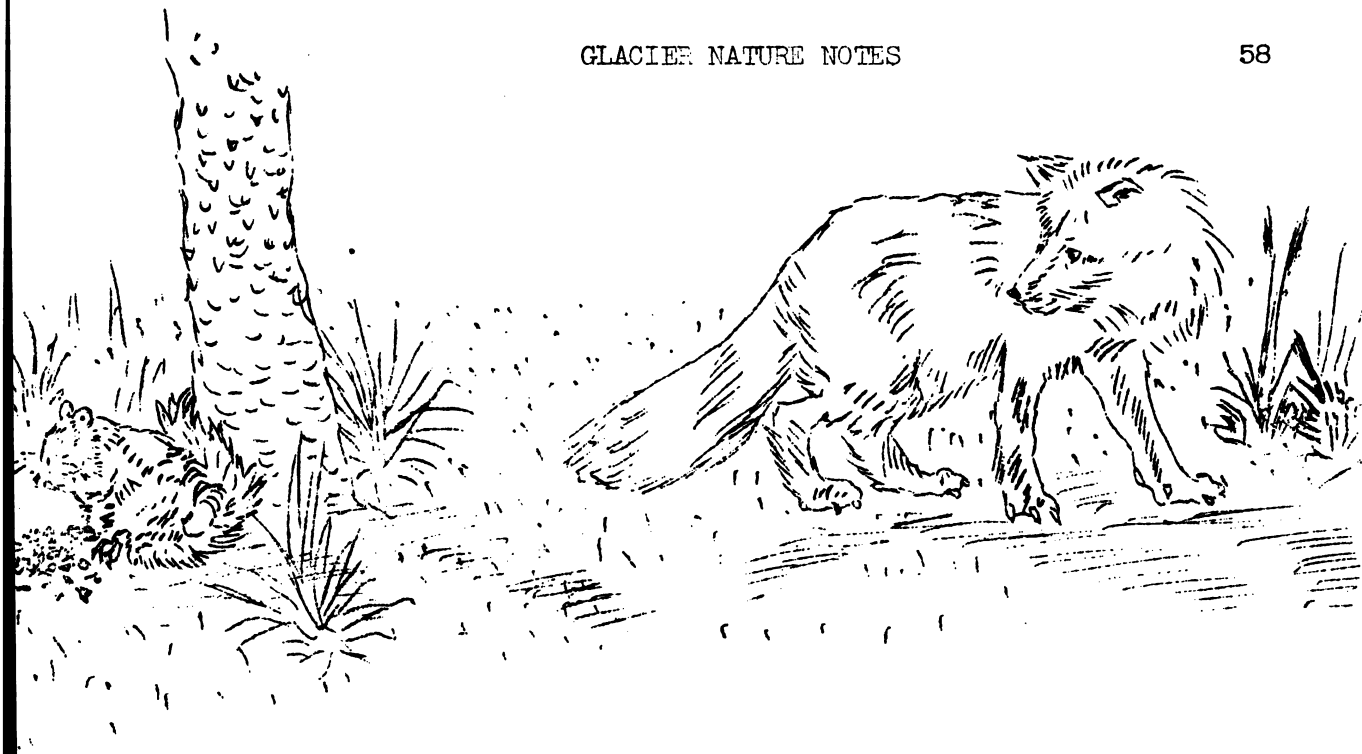

what different habits. Cross foxes are characterized by a dark strip over their shoulders and a second down the middle of the back, the cross thus formed giving the common name. They have darker tails than red foxes and nearly or completely black legs, muzzle and underparts. The silver or black fox is black, excepting the white tip of the tail, and is so-called because the hairs on the hinder half of the back, the head, and the thighs are marked with gray rings that communicate a silvery luster to the fur. Though sometimes classified as separate species by mammalogists, these are really varieties or color phases of the same species. Red and cross foxes have been found together in a single litter of pups. Silver foxes are more prevalent in the West.

Like most larger animals, foxes generally have nocturnal habits. They live not only on hares, fowl, rodents and reptiles, but they are insectivorous and frugivorous as well, the last trait undoubtedly giving rise to the well-known "Fox and Sour Grapes" story. A hungry fox will not distain to devour even carrion. At the river bank he plays the role of fisherman to surprise the wary trout or catch stupid crabs. He delights in robbing the fishers' nets as well as the trappers' traps. If only partly hungry, he plays long and cruelly with his prey. He is credited with a high degree of intelligence, is so celebrated for wits, he has become emblematical of cunning as well as for slyness, deceit, and mischief, but those who know him best deny his superiority to other sagacious carnivores, the wolf, the coyote, or the wolverine. They accuse him of showing neither presence of mind nor deliberation when in a bad plight, of falling before some simplest ruses, and, as a notorious rascal, of being impudent only when driven by necessity and hunger. Even though he does possess a quickness for gathering experience and learning to avoid new dangers, knows how to adapt himself to surroundings when pursued, is holding his own against men fairly well, yet the Reynard of tradition and literature is very different from the fox in real life indeed.

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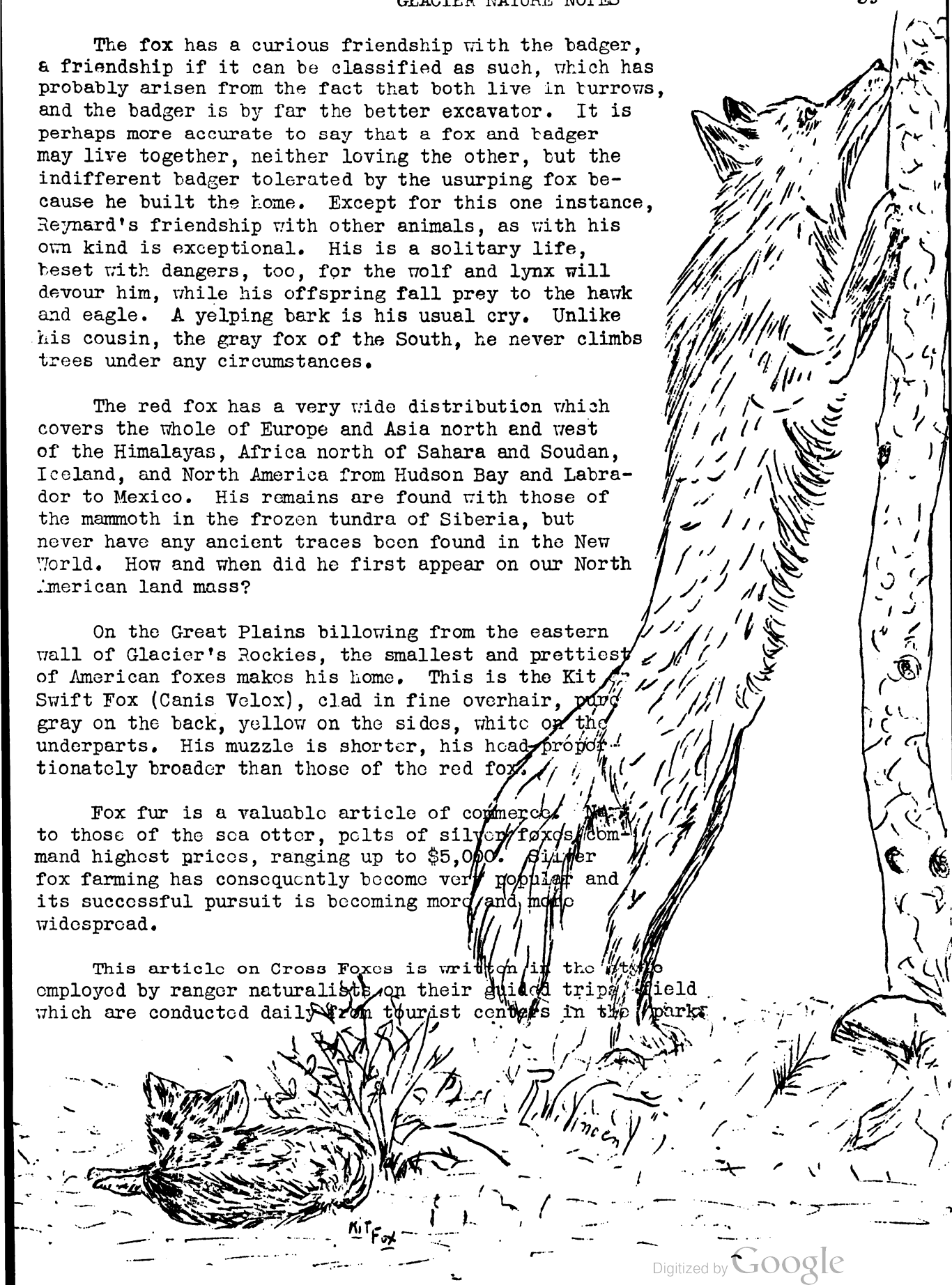
The fox has a curious friendship with the badger, a friendship if it can be classified as such, which has probably arisen from the fact that both live in burrows, and the badger is by far the better excavator. It is perhaps more accurate to say that a fox and badger may live together, neither loving the other, but the indifferent badger tolerated by the usurping fox because he built the home. Except for this one instance, Reynard's friendship with other animals, as with his own kind is exceptional. His is a solitary life, beset with dangers, too, for the wolf and lynx will devour him, while his offspring fall prey to the hawk and eagle. A yelping bark is his usual cry. Unlike his cousin, the gray fox of the South, he never climbs trees under any circumstances.

The red fox has a very wide distribution which covers the whole of Europe and Asia north and west of the Himalayas, Africa north of Sahara and Soudan, Iceland, and North America from Hudson Bay and Labrador to Mexico. His remains are found with those of the mammoth in the frozen tundra of Siberia, but never have any ancient traces been found in the New World. How and when did he first appear on our North American land mass?

On the Great Plains billowing from the eastern wall of Glacier's Rockies, the smallest and prettiest of American foxes makes his home. This is the Kit or Swift Fox (Canis Velox), clad in fine overhair, pure gray on the back, yellow on the sides, white on the underparts. His muzzle is shorter, his head proportionately broader than those of the red fox.

Fox fur is a valuable article of commerce. Next to those of the sea otter, pelts of silver foxes command highest prices, ranging up to $5,000. Silver fox farming has consequently become very popular and its successful pursuit is becoming more and more widespread.

This article on Cross Foxes is written in the style employed by ranger naturalists on their guided trips afield which are conducted daily from tourist centers in the parks.



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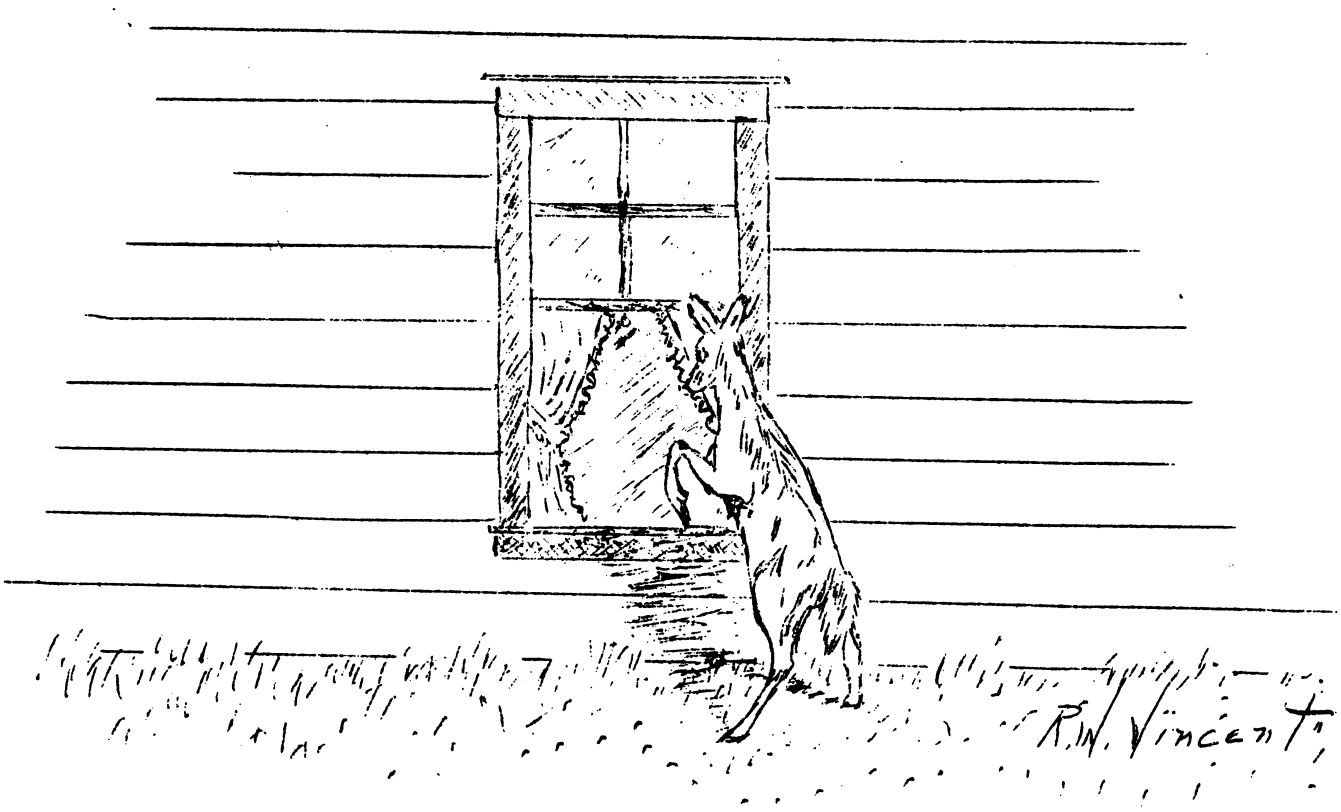
GLACIAL DRIFT

A Deer Story.- In the wake of the past fire season the following deer story is recalled. The park rangers found a young fawn while fighting a forest fire a year ago which was brought to Administrative Headquarters and reared, becoming quite tame and generally favored. One day a greatly excited visitor reported seeing a huge tawny animal jump through an open window into one of the houses of the park officials. He was certain that it must have been a mountain lion. Upon investigation, the lion proved to be the tame deer, reclining upon an overstuffed couch in the living room with evident contentment.

J.R. Eakin

The Author of "To Glacier Waters."- During the past season, the American Nature Association, publishers of Nature Magazine, sent several parties of Nature lovers to Glacier Park. On the last evening of their stay in the park, the first party had a farewell program at Sperry Chalet in which all took part. One of the members, Mrs. Walter S. Little, displayed some excellent landscapes which she had painted during the week, while her sister, Mrs. Edna F. Townsend read the poem, "To Glacier Waters" which expresses her reaction to the beauties which had deluged the party throughout the week. The poem was printed in Nature Magazine - XIV, 226 (October, 1929). NATURE NOTES has been privileged to present it to its readers, also, through the kind permission of Richard Westwood, editor of Nature Magazine and leader of the first Nature party.

G.C.R.



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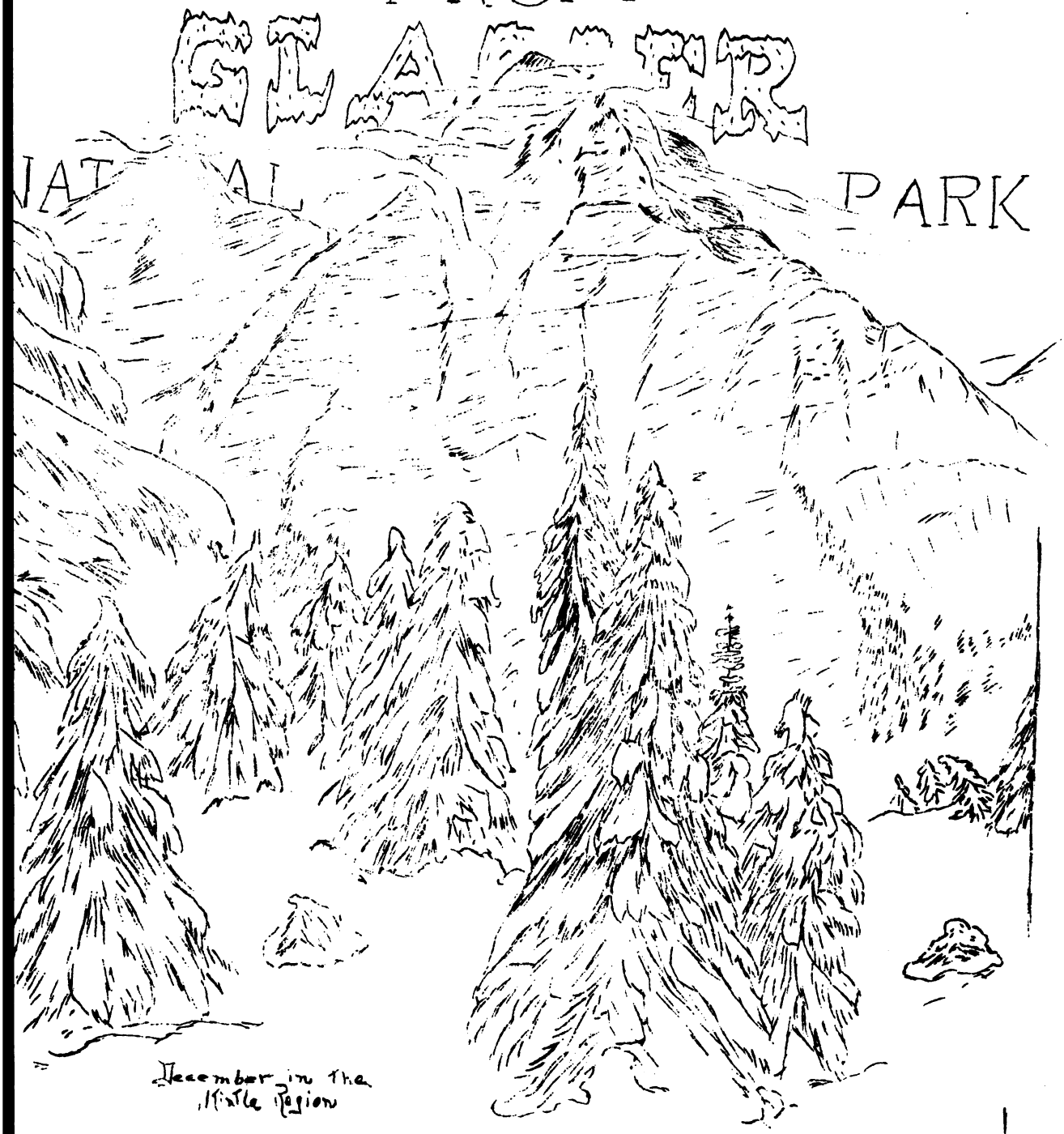
NATURE NOTES FROM GLACIER NATIONAL PARK



DECEMBER 1921

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UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
GLACIER NATIONAL PARK

NATURE NOTES FROM GLACIER NATIONAL PARK

Volume II December, 1929 Number 7

A monthly pamphlet edited by the park naturalist and distributed by the Educational Division of Glacier National Park to all interested in the Park and its natural history.

J. Ross Eakin, Park Superintendent . Dr. G. C. Ruhle, Park Naturalist

"NATURE IS MORE THAN TRUTH, IT IS BEAUTY AS WELL."

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The bears and ground-squirrels have long been asleep in snug shelters from wintry winds, the varied thrushes, fox-sparrows, and other songsters have long departed for sunnier climes, but the cheer of the chickadees, the overflowing joy of the water-ouzels, the confiding friendliness of the deer still is with us to saturate the whole wintry season with a gala Christmas happiness. In their turn, the snow-bound members of the Glacier Park family wish the readers of NATURE NOTES a most happy Christmas and joyous New Year.

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WANDERINGS AFOOT
Part III
(Continued from last month)

Norman Clyde

Clouds, apparently the forerunners of a general storm, were forming about the summits of a number of the mountains. In view of this and of the fact that my stock of provisions was running low, I decided to cross to the head of the St. Mary River the next day, and was on my way early the next morning. While traversing the meadows several broods of ptarmigans were flushed. At elevations in the vicinity of timberline these birds are fairly common in this region and during the summer months can often be approached within a few feet without becoming alarmed. However, for some reason or other, in this locality they were rather wild, the females especially, sometimes acting in a frantic manner. On this occasion one of them alighted in a shallow cascade and remained there for a few moments, the water flowing over it--an action more befitting a water-ouzel than a member of the grouse family.

Scrambling up a chimney, I soon reached the pass and paused for a few minutes to consider what course to follow. The summits of Blackfeet, Logan and Jackson Mountains were enveloped in heavy clouds and light ones hung about the top of Citadel Mountain. As the last named peak was within easy striking distance and was apparently a mountain of some difficulty and undoubtedly commanded a fine prospect, I felt a strong desire to scale it, but mindful of several previous unpleasant encounters with storms on mountain summits, I decided to forego the attempt for the time being. I therefore continued southward toward the trail, a few miles distant. Several hours were consumed in crossing glacial moraines, a portion of the Blackfeet Glacier, several swollen streams, but flowing meadows were eventually reached and a branch trail that joined the main one. The latter descended eastward through a forest composed mainly of fir and spruce to St. Mary Lake some nine miles distant. Hastening down it, I enjoyed many beautiful views of the valley of the St. Mary River and of the stalwartly buttressed Citadel Mountain, rising thousands of feet above it. As I approached the lake the rays of the evening sun lighted up its high cliffs and prow-like summit, which appeared enchantingly beautiful when seen through vistas of evergreen forest and across the blue-green water of lovely Lake St. Mary.

It is said that few lakes in the world equal St. Mary in beauty. Of a pure emerald hue it extends for some twelve miles between steep shores that project in rocky points and recede in spacious embayments. For the greater part of its length, picturesque mountains rise abruptly four to five thousand feet above it. Each of these possesses an individual charm. Going-to-the-Sun Mountain is the most commanding and spectacular, as it lifts its bold form a mile above the lake near its upper end. To the southeast rises Citadel Mountain in broad, almost vertical walls that terminate in a striking summit. Little Chief and Red Eagle Mountains on its southern margin,

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are impressive and attractive in outline. Other peaks are ranged along the Continental Divide a few miles to the west. Among these, Fusilade Mountain with the form of a narrow isosceles triangle and Reynolds Mountain with its tower-like contour, are the most conspicuous. These magnificent mountains are ever changing in appearance from hour to hour, from day to day and from season to season, as the light falling upon them varies in morning, midday, evening and night, as the clouds come and go, as autumn and winter clothe them in a white robe of snow and as spring and summer remove it.

Citadel Mountain still attracted my attention. Although it seemed formidable from the St. Mary side, a portion of the cirque lying between the two highest parts of the mountain appeared to be scalable. Late one morning I decided to attempt an ascent. After going up the river several miles I found a fordable place and waded the stream. I then made my way through a dense willow thicket and across a stretch of tangled shrubs and fallen timber. A fifteen-hundred foot climb up a steep slope covered with heavy brush followed. But after these difficulties were surmounted, the way led across the grass-clothed floor of the cirque, past matted thickets of Arctic fir and up over a series of benches to the wall of the cirque. I scaled the latter by scrambling from shelf to shelf and up chimneys, by the previously determined route, to the crest of a ridge. From there I travelled along benches for about a half mile until abreast with the summit. The latter was still several hundred feet above. Numerous chimneys cut the thick belt of limestone. Up these I scrambled and was soon standing on the highest point. Apparently it was the first occasion that human foot had trodden upon it. A heavy wind was blowing and a storm had gathered about the Blackfeet group of mountains a few miles to the west. Although the view was extensive it was obscured somewhat by the clouds that hovered here and there over the range. Directly to the west and only several miles distant, was Blackfeet Glacier. The emerald expanse of St. Mary Lake, a mile below, was marvelously beautiful and the eye delighted to follow the forms and hues of the other mountains that rise around it. The lateness of the hour prevented any lingering on the summit. Therefore, after a short pause I began the descent, going down the southern face of the mountain and over a pass into the cirque through which I had passed earlier in the day. While proceeding along the wall of the latter I came upon some magnificent specimens of bighorn sheep. One of them stood for a few moments on a projecting point, silhouetted clearly against the evening sky, but when approached, it wheeled about and vanished around a sharp bend. I hastened on, dropping down from the "shelved" walls of the upper cirque, crossing the alpine meadows and pushing my way down the brush-covered slope. Eventually the base of the mountain was reached. After picking my way through the dense timber I forded the St. Mary River and hurried down the trail toward camp, reaching it about nightfall.

Another interesting ascent was that of Mt. Siyeh, one of the highest mountains in the park and situated a few miles north of Lake St. Mary.

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Upon reaching its summit I was greatly impressed by the huge cirque carved into the eastern flank of the mountain. Almost half of it has been eroded away by a glacier, a diminutive remnant of which can be seen clinging to the cirque wall and tinting the waters of a lake four thousand feet below, a turquoise blue. As it stands away from the main crest, this peak commands a superb view of scores of rugged peaks that rise along it. While crossing a meadow on my return, I came upon a large female grizzly and two cubs feeding in a meadow. When first seen she was moving toward another portion of the mountain as rapidly as her excessive weight would allow. There was something ludicrous in her ungainly haste and in her solicitude for her cubs. After running about fifty yards she would wheel about, rise upright until her cubs overtook her and then dash ahead in a lumbering gallop. After repeating this procedure several times she vanished into a grove of Arctic fir to be seen again for a few moments peering out over the stunted firs.

Another fascinating experience was an ascent of Going-to-the-Sun Mountain, one of the most striking in the region. Leaving camp early one morning I followed a trail to the rear of the mountain and then, after scrambling from shelf to shelf and up a chimney, I emerged on the summit, a few minutes walk from the highest point. Then a glorious panorama of mountains, valleys, lakes, forests and glaciers burst into view. Although not a really difficult mountain to climb, judging from the record on its summit, not a dozen persons had made the ascent.

Having scaled most of the peaks accessible in one day trips from Lake St. Mary I wished to explore those in the vicinity of Gunsight Pass, one of the most rugged regions in the park. After obtaining provisions sufficient for a week, I followed the trail to Gunsight Lake, a distance of about nine miles, but after spending the night there, clouds settled down over the mountains to such a degree as to render climbing them out of the question. I therefore crossed the pass and made camp at Lake Ellen Wilson, a beautiful sheet of water hemmed in by precipitous mountains. In spite of unfavorable weather conditions a number of ascents were made in the next few days. Of these, the most interesting were those of Mt. Jackson, Fusilade Peak and Blackfeet Mountain. The first of these rises directly above Gunsight Pass to an elevation of some ten thousand feet above sea-level. During the day in which I climbed it, there was a succession of snow squalls, but as these were local and of short duration they caused little inconvenience. Usually shelter was secured beneath a rock until they passed. Upon reaching the summit a considerable number of these storm clouds were seen floating about and pausing for a while about any peaks that happened to obstruct their course. As Mt. Jackson is centrally located and is one of the highest mountains in the park it commands a view whose subline grandeur would be difficult to surpass. Yet although it is comparatively easy to ascend and rises directly above one of the main trails, apparently only a few parties have ever stood upon its summit.

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Another noteworthy day was the one spent on Fusilade Mountain. Seen from Lake St. Mary, this peak has a spire-like form. It consists, however, of a long ridge, surmounted by a row of pinnacles, that has been deeply eroded on two sides by glacial action. In making the ascent I worked along a steep mountain slope from Gunsight Pass for several miles and then proceeded to scramble up the most promising of the numerous chimneys that confronted me. Seeing a wild goat ahead of me, I attempted to approach sufficiently near to photograph it, but becoming alarmed, it vanished among the rocks. When I was within a hundred feet of the summit of the highest pinnacle a large one was seen looking down at me from a shelf almost directly overhead. Apparently it was the one seen some distance down the mountain. In order to escape from a supposed enemy it had climbed higher and higher until within a few feet of the summit of the loftiest spire. The puzzled and baffled expression with which it gazed down at the unwelcome visitor was very amusing. After a few moments it bounded through an opening in the rocks and was seen no more. I then scrambled to the highest point--apparently unscaled before--and enjoyed viewing the now familiar array of mountains from a new angle. In the descent another goat was seen lying on a shale slope below the upper rocks. This was unusual, as they generally rest during the greater part of the day on the ledges that line the cliffs. While approaching it, I startled another on a shelf a few yards below him. The alarmed animal sprang to its feet, regarded me for a few moments with a look of mingled fear and anger and then dashed away over the precipitous rocks. Somewhat later I met an old female and two kids coming up a narrow ridge. Upon seeing me she seemed stupified for a few seconds and then darted down an almost sheer slope. One can never predict what a wild goat will do in any circumstances. On one occasion, as I was walking along the margin of a small lake toward a ledge several hundred feet in height I noticed an old male going in the same direction on the other side. Curious to see what the animal would do if one attempted to head it off, I hurried up the cliff and when its summit was reached looked across a grassy slope toward lofty crags up which I expected to see the goat scrambling. Seeing none, I glanced back and was surprised to see the animal walking back along the same side of the pond that it had used in approaching the ledge, and then complaisantly take up a position on a little mound of glacial debris at a distance from rocks of any sort.

A rather eventful day was spent on Blackfeet Mountain. After crossing the eastern end of Blackfeet Glacier and passing along horizontal shelves for several miles, I scaled the eastern slope of the peak. By some, the view obtained from this mountain is regarded as the most sublime in the park. To the southeast Pumpelly Glacier drops toward a canyon almost abysmal in depth; to the northeast Blackfeet Glacier sweeps downward toward the verdant St. Mary Valley; to the northwest, across a profound cirque, Harrison Glacier cascades thousands of feet down the slopes of Mt. Jackson. The view of the distant mountains is scarcely less imposing. The descent on several occasions was rather embarrassing. Encountering a steep serac or ice cascade, I was obliged to cut my way over

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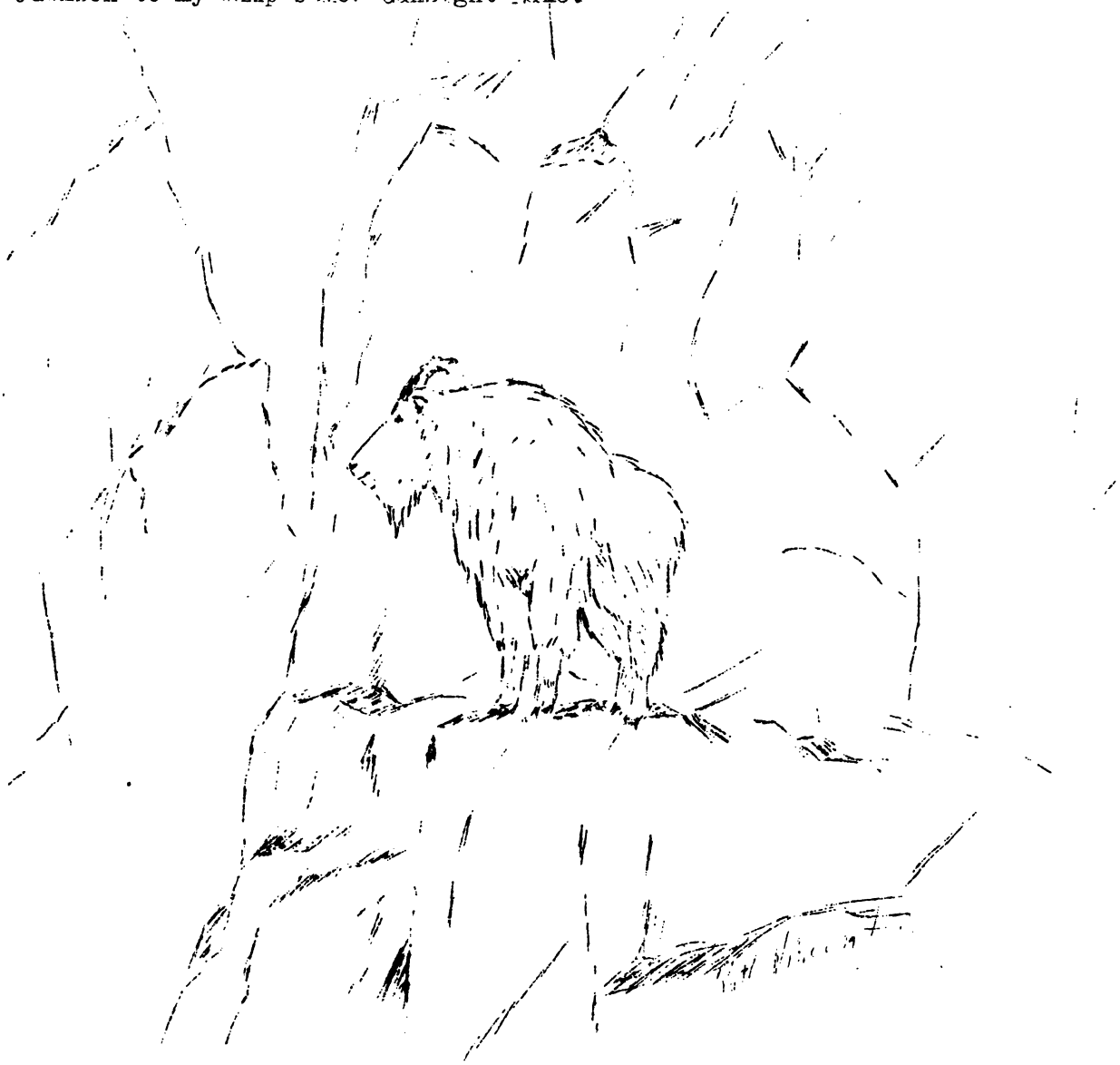
a slippery ice slope to some limestone cliffs. These in their turn presented some difficulties and after they were solved, an electric storm came sweeping down over the mountains. But having found shelter beneath an overhanging rock, it was pleasant to listen to the thunder rolling on the heights above, and to watch the clouds as they hurried by, carrying torrents of rain. But the storm soon passed, and I then picked my way across an arm of the glacier and hastened onward through the flowery meadows and open spruce groves of the middle slopes of Mt. Jackson to my camp below Gunsight Lake.



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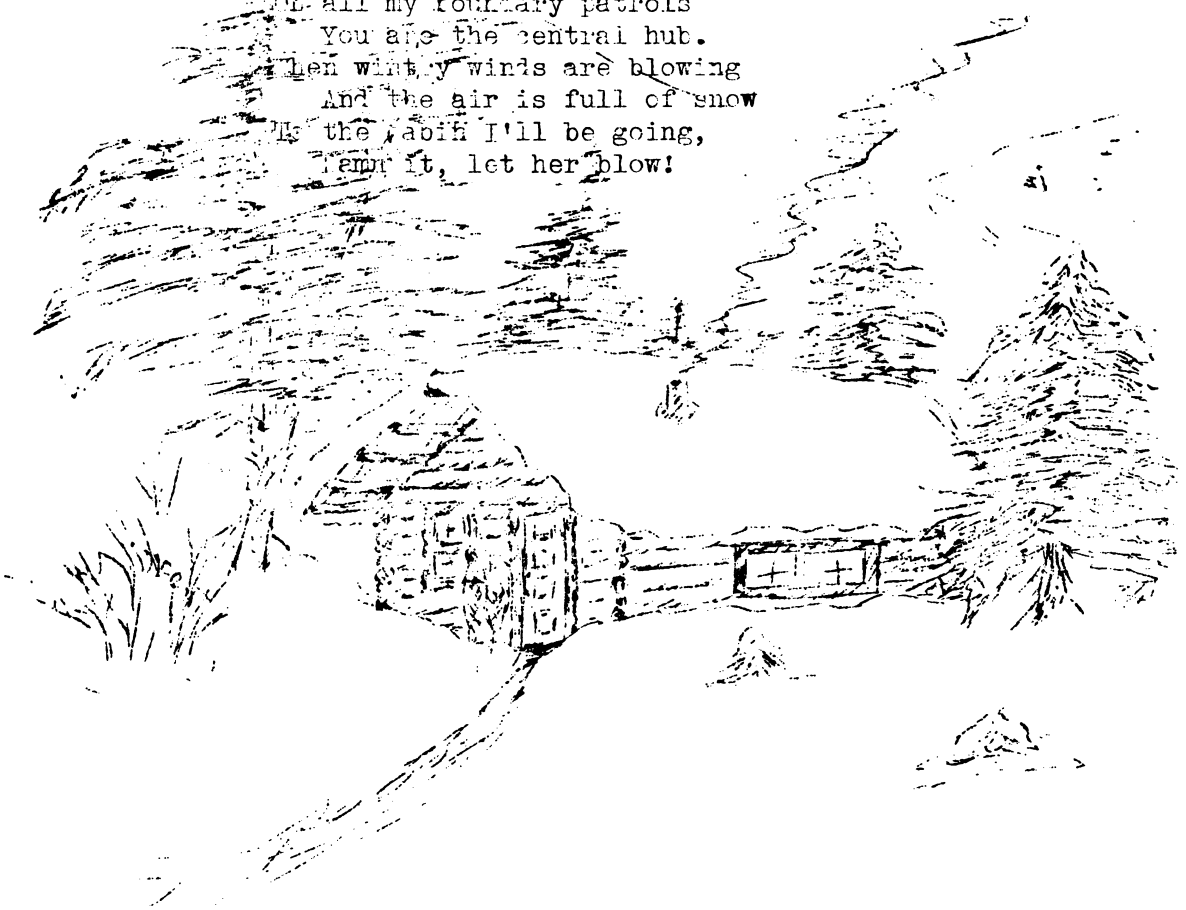
THE SNOWSHOE CABIN

You're a homely little cabin,
But I'll tell the world you're good.
There's water flowing by your door,
And a first class chance for wood.
Your cellar's full of frozen spuds,
Your cupboard's full of grub,
To all my boundary patrols
You are the central hub.
When wintry winds are blowing
And the air is full of snow
In the cabin I'll be going,
Damn it, let her blow!



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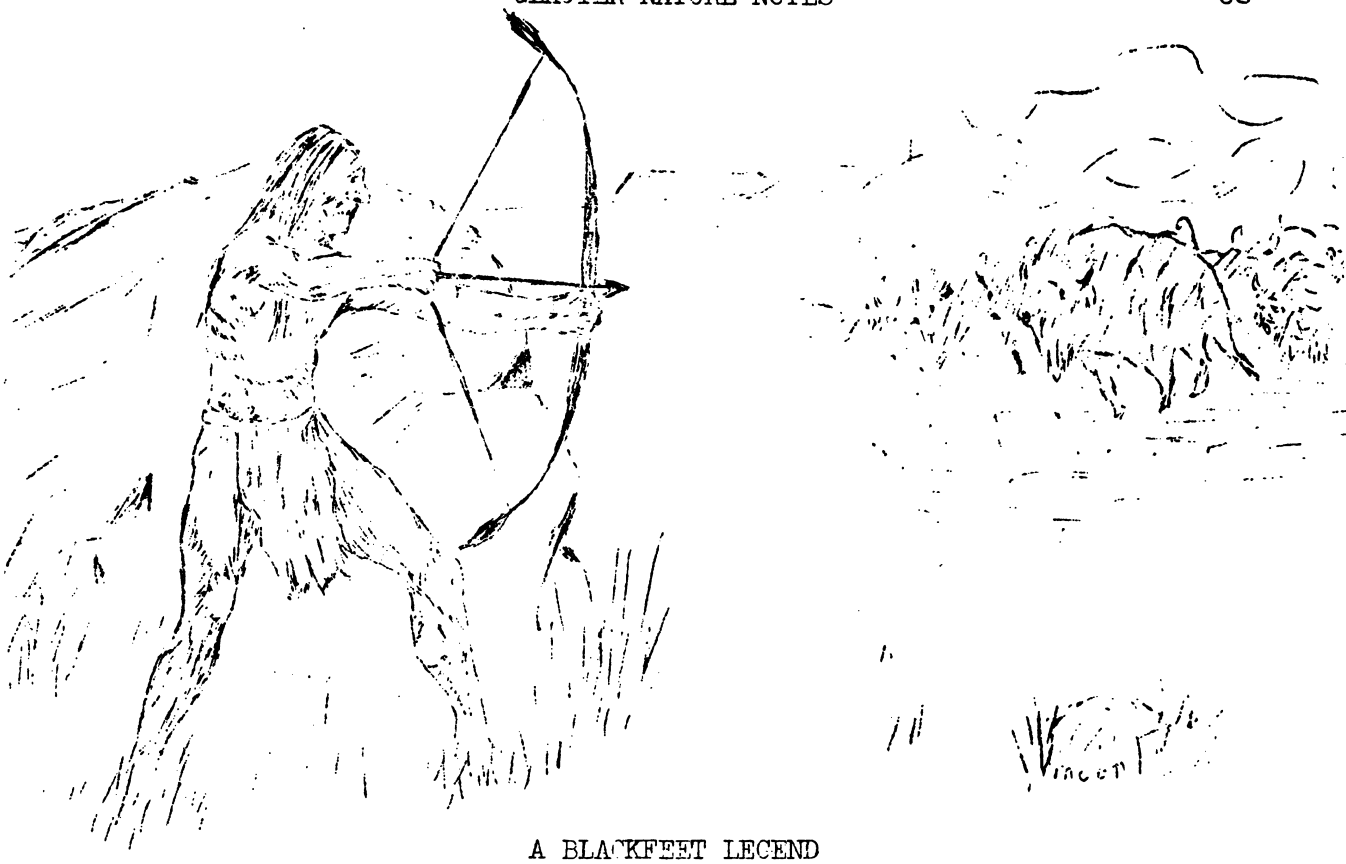

A BLACKFEET LEGEND

The old men of the Blackfeet Nation to whom the legends and traditions of their forefathers are sacred tell how Napi, the Great Spirit who made all the country, came to give people hands. When first he made them, he gave them huge paws like those of the bear. Soon afterward he made the other animals.

In those almost forgotten days of long ago, the buffaloes spied the people, and finding them without means of protection, preyed upon them. This persisted until one day Napi discovered them devouring a woman they had just killed. Napi was perplexed and grieved. "Hai-yah! Hai-yah!" he cried, "I have not made these people right; they cannot defend themselves against the buffaloes!" He sat on a rock and cried, and tore his hair, and tried hard to think how he might help his people. After a long time, he rose, for he knew what he would do.

Napi took each of the people and split their paws, and made them long fingers. Then he fashioned bows, arrows, and knives, and gave them strong right arms so they might draw the bows with great force. He taught them how they might use them.

A few days later the buffaloes came again that they might eat more people. Crouching behind a rock, a naked ruddy figure let fly the first arrow to the heart of the leading animal. "Ah, my brothers," the unfortunate victim cried aloud, "a great fly bites me." And he fell down and

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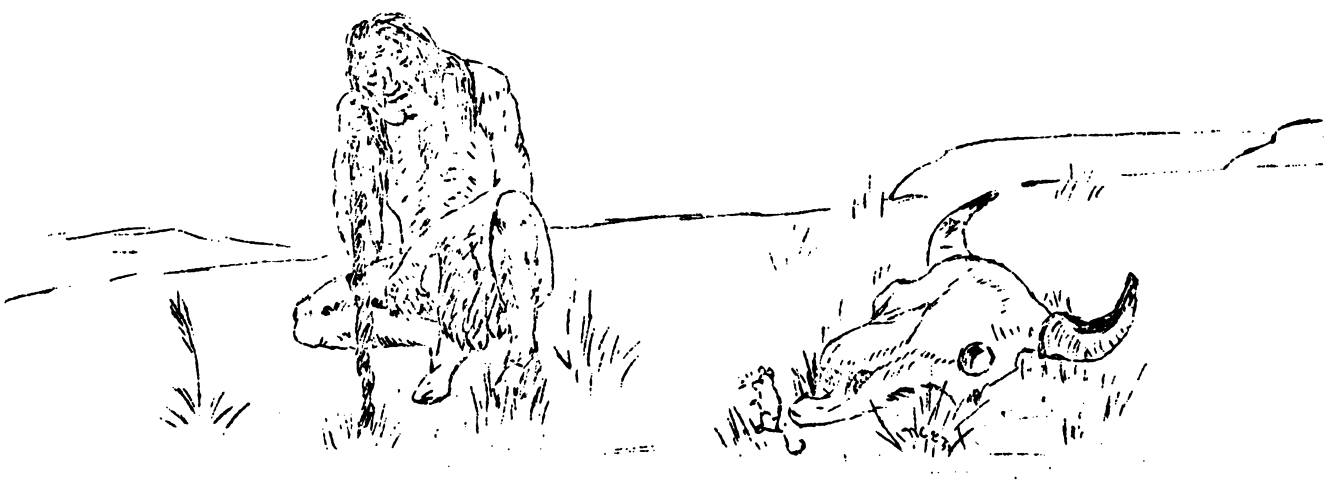
died. Then other arrows sung as they sped thru the air, and other buffaloes fell. Finally the animals saw whence this terrible winged death originated, so they cried aloud to the archers: "You people, you people, have pity! Pity! We will never kill nor eat any more of you again!"

All of this time, Napi had complacently sat by and looked upon the killing. Now he cried aloud, "Hold! We shall see who shall be eaten, the people or the buffaloes."

Napi called all the animals of the field to take the part of the people. Then he fashioned stakes of bone, and each of the animals gambled against the buffaloes. First the elk essayed and lost. Then each animal in turn tried, but always the buffaloes were too smart and could not be outwitted. On the third day all of the animals had been beaten except the mouse whose turn was now come. Now all of the animals shouted loudly, "Take courage, take courage, little mouse!" The little mouse did take courage. He worked his tiny paws so fast that the buffaloes were bewildered and could not follow the bones carefully. Now they chose the wrong stake and lost.

All of the animals rejoiced and shouted, the people strung their bows and killed buffaloes so that all of the animals could feast heartily. Every one was happy that the mouse had been victor, that no longer should the people be eaten by the buffaloes.

When the days of feasting had ended, Napi had not forgotten the great service of the mouse. He gathered all the buffalo skulls together and gave them to the mice for homes, so that even today, you will find them living in bleached skulls that lie on the plains.



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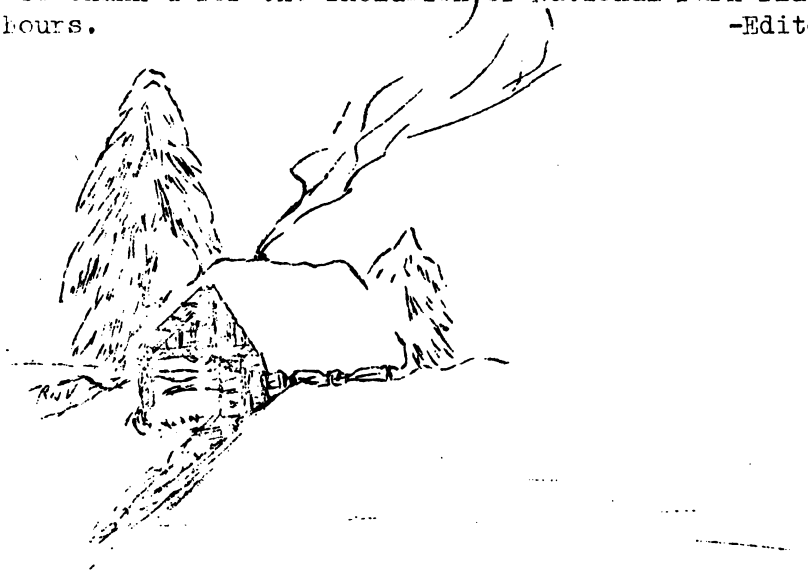
GLACIAL DRIFT

"THE SNOWSHOE CABIN" appears on the walls of the cabin on the South Fork of Kennedy Creek. My attention was first called to it by Temporary Ranger Hugh Black who was stationed at Cutbank last summer. I am unaware who the author is, but I strongly suspect that it has been written by Ranger Ray Newbury, inspired by a feeling of love for the shelter whose cheery welcome after a weary day of snowshoeing drew forth the stanza. Certainly the writer lives and breathes the lines that he utters. -Editor.

During the month of November, station KGO (Oakland, California) and other members of the Pacific Coast network of the National Broadcasting Company featured a National Parks' Program on which the park naturalists of several parks participated. Topics on Glacier National Park presented were "Glaciers and Scenic Features," "Birds and Animals," and "Indians". Simultaneous with these broadcasts, station KPO (Halo Brothers, San Francisco) invited the park naturalists to participate in their daily Big Brother Hour. Listening kiddies were immensely pleased with stories of the Blackfeet, and, by request, one of the most popular is placed in this issue of NATURE NOTES. The story is not original with the park naturalist, but, so far as he knows, was first told by Dr. George Bird Grinnell (See volume II, page 10). Big Brother Pitman of KPO is to be thanked for the inclusion of National Park flavor in his November hours. -Editor.



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NATURE NOTES FROM GLACIER NATIONAL PARK

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UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
GLACIER NATIONAL PARK

NATURE NOTES FROM GLACIER NATIONAL PARK

Volume III January, 1930 Number 1

A monthly pamphlet edited by the park naturalist and distributed by the Educational Division of Glacier National Park to all interested in the park and its natural history.

J. Ross Eakin, Park Superintendent Dr. G. C. Ruhle, Editor

"NATURE IS MORE THAN TRUTH; IT IS BEAUTY AS WELL."

New Years Greetings 1930

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IN RECOGNITION

During the past month (December) the Educational Department thru the park naturalist received holiday greetings with attendant best wishes from scores of 1929 park visitors and readers of NATURE NOTES - from residents of thirty-two different states, from Canada and France. It is an impossibility to acknowledge all notes of appreciation and good will personally, properly; there are too many of them. This little inclusion, however inadequate or imperfect, expresses a sincere feeling of gratitude on our part and a promise of conscientious endeavor to be of greater service to the appreciative friends and guests of Glacier Park in 1930.

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GLACIER = JANUARY

Dawn of a New Year - her morning skies aglow
with soft living hues-- of hope, courage, expectation-
Frost laden heart of winter-
With frigid, piercing, biting winds of Frost's kingdom
moaning, sobbing, tugging at shivering cabins-
But with landscapes softened by drifts,
the harvests of starry flowers fallen from Heaven-
With feathery rime on wood and stone-
Rose, azure, amethyst-purple shadows in abbreviated twilight-
Peaks aflame with scarlet-gold of alpen-glow-
Or flaunting snowy banners hung high on their topmost summits-
Pine trees black-pencilled against white or purple backgrounds-
Or hooded with snow like penitent friars, silent, motionless-
Canopies of evergreen sprays as shelters for smaller animal folk-
Twitter of snow-birds, reaping an abundance of weed-seeds,
provided by opulent Nature-
Cheery chatter and chanting of chickadees, feathered fluffs
of the woodland-
Rare song of the solitaire, or melodious medley of ouzel-
Restless beaver and muskrats, moving about beneath a shell of
ice, searching for bark, roots, food-
Toboganning of otters down icy snowbanks, their slides always
ending in a splash-
Tracks in the snow: what comedy, what tragedy, what drama,
what life is portrayed, is written in this fashion-
Ski-trails: narrow ribbons in a smooth-surfaced whiteness,
with either side studded with imprints recording the
piston-like motion of ski-poles-
Iridescent Sirius, brilliant Procyon, giant Orion, and
ruddy Betelgeuse gleaming thru cold, crystal nights,
like angled spars darting beams of red, green, blue-
Pale diffused light of sun's disc, indistinct in the snowstorm-

Thou January

Glorious, immaculate,
softly colorful, tuneful, mellifluent-
Thou Phoenix art arisen from naught but ashes,
Ashes of bygone years scattered hither and yon
till lost in Oblivion
With hope, gleaming like the star in the night,
leading on into the future.

TINY

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PAUL BUNYAN'S MISTAKE

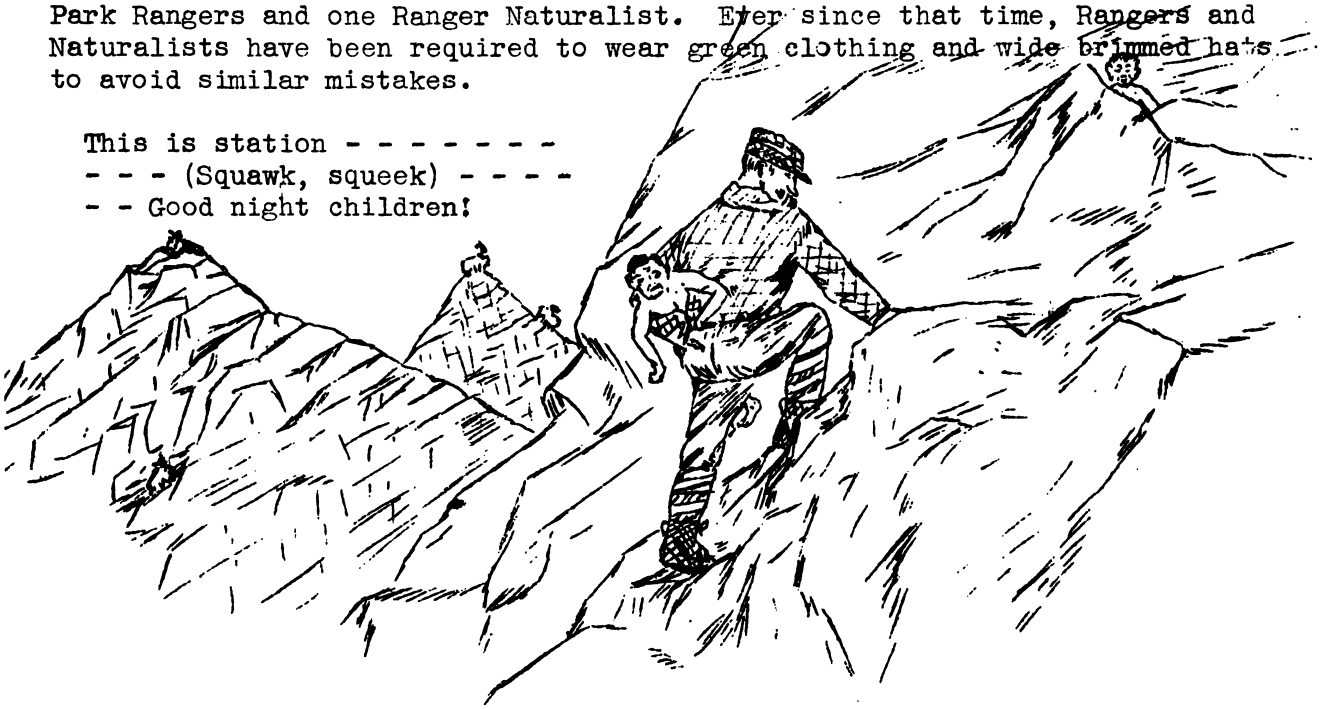
Ray E. Newbury, Park Ranger

There was a time, when Glacier Park was new, that the distribution of the wild animals was not the same as now. The chief trouble was with the white goats. Nearly all the goats lived at lower altitudes than at present and were very thin from insufficient food. How long this sad state of affairs would have persisted is hard to determine. It might still have been prevalent were it not for the heroic labors of one man who placed them where it seems that nature intended them to live.

When Paul Bunyan first came to Glacier Park he took great interest in all the animals. After due observation and cogitation, he saw that goats were misplaced; that they were ideally adapted to living on higher rock ledges. How to get them there was another problem. Being a man of great determination, Paul carried them up to the crags one at a time, until almost every mountain had at least one pair of goats. Most all of them have remained just where he placed them ever since. Occasionally, one or two have strayed to lower slopes; are to be seen on slopes like those at Cracker Lake. This calls to mind Paul's error of judgment and the reason why he is no longer at Glacier Park.

After all the goats had been placed on the mountains, he observed that a few would continually stray to lower ground. These, Paul was compelled to repeatedly carry back up. After doing this several times he noticed a peculiarity in the ones that came furthest down. Imagine his chagrin when he discovered that he had carried animals that were not goats at all. Their horns were too short and their ears too long. He found them to be three Park Rangers and one Ranger Naturalist. Ever since that time, Rangers and Naturalists have been required to wear green clothing and wide brimmed hats to avoid similar mistakes.

This is station - - - - - - -
- - - (Squawk, squeek) - - - -
- - Good night children!



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Winter Patrol in Glacier Park

G. N. Paige, Ass't Chief Ranger

Have you ever put in a winter
  Where the wind seems always to blow,
Sweeping down from the bleak mountain passes,
  And most every day brings more snow;
In a cabin set back in the timber
  Somewhere near the Canadian line;
With white peaks of the Rockies as guide posts
  While patroling thru forests of pine?

Four log walls: they are barren of pictures;
  Just two windows; a snug fitting door;
There's a cot, and a table, and cook-stove,
  And tin dishes you've used once before.
All the meals are of sour dough for hot cakes,
  Or vegetables brot in a can,
Or dried prunes, navy beans, ham and bacon,
  That were packed in ere winter began.

You snowshoe twelve miles to the mail-box
  Where weekly the stage passes by;
The stage horses find it tough going
  Thru snow that is piled shoulder high;
You receive a whole arm-load of papers,
  A week's issues all come in one bunch,
So that night you are reading past midnight
  To try to get caught up at once,

While the cold settles down in the logs
  With a snap like a pistol's shot,
While the mercury drops and keeps dropping,
  While the good, little stove glows red hot.
In morning the creeks are all frozen,
  Oh that's most important, indeed!
For you chop thru the ice to the bottom
  To get all the water you need.

You must snowshoe all over the district
  To make sure that all poachers stay out,
And you follow the tracks in the fresh snow
  To study what has been about.
You soon learn that all troubles and trials
  Are not fastened on people alone,
That each little beast of the woodland
  Has some troubles and trials his own.

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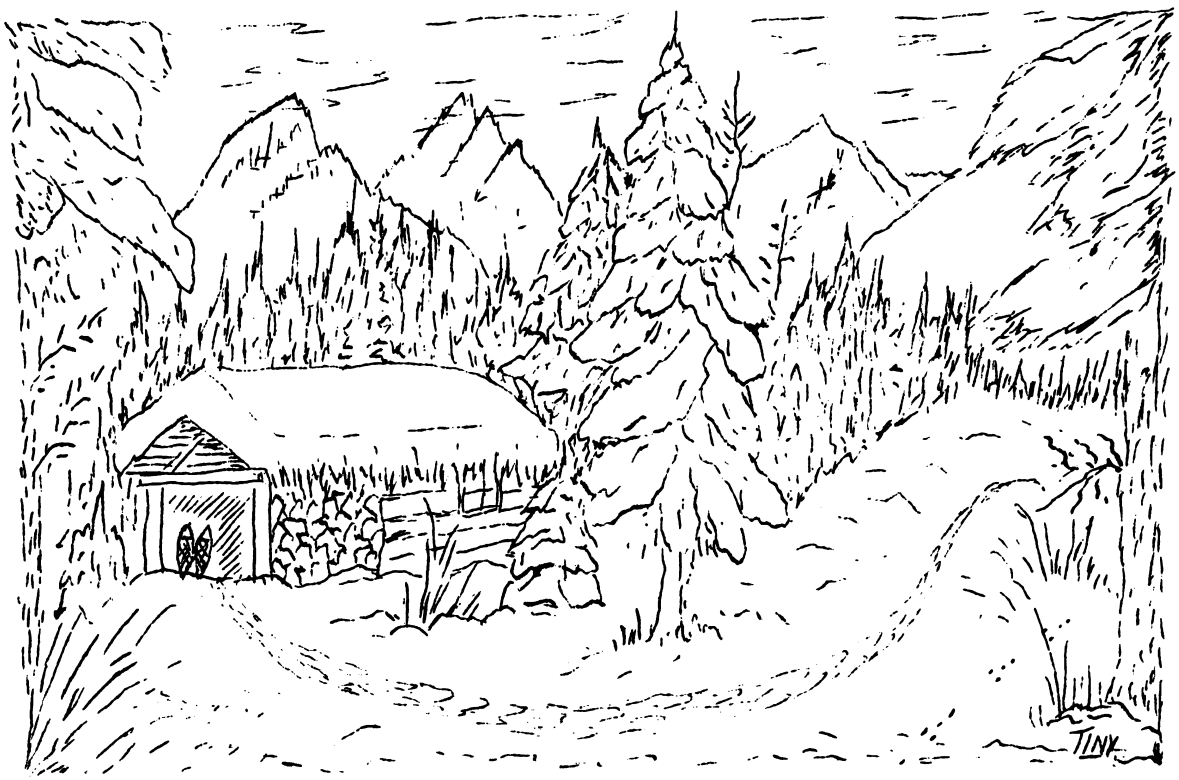
Here a rabbit was running for dear life,
  For a marten did want him for lunch;
Here's a deer that was jumped while 'twas feeding;
  Here three coyotes came by in a bunch.
It's the old story told in the woodland,
  That the fittest are those that survive,
And winter's the season of seasons
  That the weak must pass o'er the divide.

You come home all tired out in the evening;
  Stand the snowshoes alongside the door;
And you think that this cabin's a blessing
  When the long day's journey is o'er.
When the fire's again brightly glowing,
  There's nothing much else left to do,
But to wait for the coffee-pot's singing,
  And my! Smell that Mulligan stew.

If you've ever put in such a winter,
  Tho at times you have found it quite tough,
You have proved to yourself and your fellows
  That you're made of about the real stuff.
There are others with lives far more easy,
  With parties and dances and shows,
But give me the snug snowshoe cabin
  In the woods where the free, wild wind blows.



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WANDERINGS AFOOT

Part IV

Norman Clyde

Having attained all the objectives of this knapsack trip, I returned to Lake St. Mary and secured provisions for another to the region about Logan Pass, situated on the Continental Divide, a few miles north of the country that I had just finished exploring. Camp was made near a small grove, or rather thicket, of alpine fir which abounds in the meadows extending from the pass in the direction of Mt. Reynolds. These charming grassy expanses with their wonderful outlook and the numerous picturesque mountains rising nearby render this a delightful place to linger for a number of days. Wild animals are common. Deer, sheep, goats and occasionally bears are to be seen.

I was interested especially in scaling some of the surrounding peaks, several of which were apparently as yet unclimbed. Of these, Mt. Reynolds, a very picturesque cone-shaped mountain, was the most conspicuous. A morning or two after my arrival, I struck out across the meadows toward it, and after selecting a possible route to the summit, ascended a steep chimney, threaded my way up the steep limestone ledges, eventually reaching the highest point with comparative ease. Again I was thrilled by the great panorama of mountains. To the uninitiated all mountains may appear to be of somewhat similar character and the views seen from them much alike, but to the lover of mountains everyone has an individuality of its own and the prospects obtained, even from neighboring mountains, always vary. There were, as usual, the serried lines of peaks along the main divides, with profound valleys and cirques about them. Directly below was a beautiful lake hemmed in by encircling mountains and appropriately called Hidden Lake.

Mt. Cannon, on the other side of this lake, attracted my interest, and, fearing that the weather might change, I decided to attempt an ascent that day. After descending from Mt. Reynolds and traversing several miles of intervening country, I ascended a broad chimney in the desired mountain and then followed a narrow jagged ridge toward the summit. Mr. Reynolds is almost a spire, but this mountain is a long ridge approaching a knife-edge with small peaks at intervals. A driving snowstorm struck me while proceeding along it. I found shelter beneath a rock, but as time was precious I soon left it and pressed onward. The storm soon passed over and the summit was gained. The immediate surroundings were very imposing, glaciers having sheered down the mountain on either side and carved out profound cirques. To the northwest, across a deep, forested valley, rose Heaven's Peak glittering in the rays of the lowering sun. Directly westward, the elongated mountain dropped so abruptly toward Lake McDonald that it seemed almost like gazing down the prow of an immense ship, to a long sheet of water shimmering brightly in the sunlight. Having little time to linger, I hastened down the mountain and then followed a goat trail along the southern face of Mt. Clements. Although these trails are usually a convenient and comparatively safe mode of going around a mountain, occasionally they lead one into somewhat hazardous situations. The one in question narrowed down and for some distance followed the verge of a perpendicular cliff.

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Although several feet wide in its narrowest portion, it sloped downward and was composed of shaly rock that rendered one's footing somewhat insecure and added to this was the fact that the wall behind, of similar material, offered no dependable hand-holds. Proceeding rather gingerly, I eventually traversed it and succeeded in getting down to the meadow below the ledges. It was already dark. As I hastened along I heard a sound of animals running, and looking around, saw a band of seven mountain sheep dash past. When about forty yards distant, they stopped suddenly, and, throwing back their heads adorned with magnificent horns, gazed curiously at me for a few moments and then bounded away across the meadow and up the mountain-side. On the following day a wonderful view was obtained from an unnamed peak west of Hidden Lake down into Avalanche Basin some four thousand feet below and set in a girdle of dark forest. Across the chasm-like depression was Sperry Glacier and from it streams cascaded down several thousand feet to the lake. The slender form of Mt. Reynolds appeared more stately than usual as seen across Hidden Lake from this peak. After leisurely descending the mountain and skirting the lake through lovely groves of spruce and fir, I climbed a series of limestone benches and strolled through grassy meadows toward camp, often pausing to admire the marvelous panorama seen in every direction and constantly changing with the changing light.

After another day of delightful climbing and exploring, I went northwest along the trail that leads to Granite Park. At every turn there were intrancing vistas up and down the heavily wooded valley, of the mountains which I had left and of those westward beyond the valley, from the beautiful Heaven's Peak to the rugged Kintla group on the northern horizon. When abreast of Mt. Gould I stopped and scaled it. Although a rather easy mountain to climb from this side, it commands one of the finest views obtainable in the park. The sheer drop to the west of thousands of feet; the glaciers clinging to its flank far below; the chain of charming sapphire and turquoise lakes in the verdant Swiftcurrent Valley, rugged mountains and great cirques in almost every direction form a varied panorama of great sublimity and beauty. On my way down, I spent considerable time in watching the mountain sheep that were very numerous on this slope of the mountain. In a number of instances I succeeded in approaching to within a few yards of superb rams which usually stood motionless for a few moments in a most picturesque pose on a shelf or point and then walked leisurely away, or, if alarmed, bounded rapidly down over the rocky ledges.

NATURE NOTES FOR LIBRARIES

We are especially desirous of placing NATURE NOTES in libraries with periodical reading rooms where they receive good circulation. On your trip to Glacier Park on the Great Northern's peerless Empire Builder this summer, ask the porter of the library-observation car to let you see the most recent issue of this pamphlet-publication.

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WINTER KILL

J. Ross Eakin, Park Superintendent

The severe winter of the northern Rockies is again taking its annual toll of the wild life of Glacier National Park. This is nature's way of keeping the various species virile and vigorous, of restricting the animal population so it will not exceed the food supply, of furthering the "balance of nature". This "survival of the fittest" assures that no weaklings shall be carried over into the breeding season to lower the general hardiness of the denizens of the wilderness.

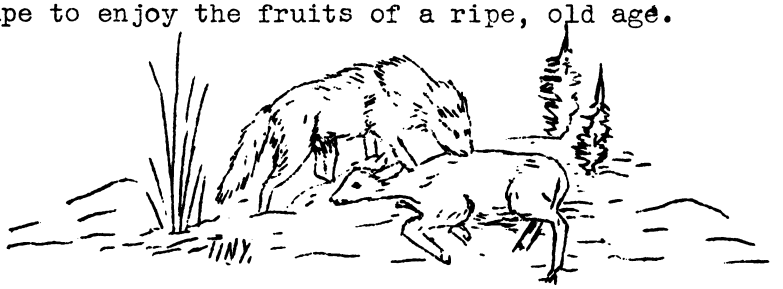
The sole exception to natural winter kill is peculiar to Glacier National Park. The Great Northern Railway skirts the southern boundary of the park near the area of the greatest concentration of deer. Some deer desert the feed yards, go outside the park and, like foot-loose tramps, walk down the railroad tracks to escape deep snow. To date thirty have been killed by trains this season, but no means of protection can be provided. Despite these fatalities, extra to normal deer mortality rates, the numbers of deer are showing gratifying increases.

Game must not increase until its numbers exceed the available food supply. Nature's means of regulating game numbers, of preventing too rapid increase in wild life and keeping the stock healthy, are losses from predatory animals, from breaking thru air-holes on frozen lakes and rivers, from snowslides, and from "winter kill". An animal incapable of obtaining sufficient food dies of cold and starvation. This is called winter kill. It is nature's trump card to prevent inbreeding.

Coyotes are not numerous in the park this winter. Signs of only one mountain lion have been discovered by rangers on patrol and no evidence of wolves has been observed. Several reported coyote kills are undoubtedly winter kills upon which coyotes have been feeding.

Contrary to the usual belief snowslides are destructive to moose, elk, mountain goats and bighorn sheep. Several years ago one snowslide destroyed four elk. Last winter another slide killed two moose. Deer usually drift to the lower valleys and escape this menace. Once in a blue moon moose bog down in lily ponds, their favorite feeding places, and cannot escape. A very few animals run against sharp sticks and are so badly torn they die or fall prey to predators. Deer and elk may become frightened and jump over precipices. Losses from such causes are rare.

With violence and death lurking at every turn, few of the larger game animals escape to enjoy the fruits of a ripe, old age.



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AN ELK FATALITY

Clyde C. Fauley, Park Ranger

On my last patrol to Harrison Lake, I found a large bull elk frozen in the ice. He had been walking on the snow-encrusted thin ice and had apparently broken thru an air-hole. The ice had been shattered for twenty feet in an irregular circle and it was apparent that the mighty animal had become wild with terror and had threshed around in a futile and desperate manner. With fatal exhaustion the great antlered head had dropped beneath the surface so that only the tip of one antler and the top of the hind quarters were visible.

This makes two elk that have perished in this lake within a month, one having been discovered on my patrol of December 20th. Harrison Lake is a veritable death trap to deer or elk due to its spring holes and so-called air-holes. A four-legged animal has little chance when breaking thru ice into deep water, tho a man can easily crawl out and be no worse for the experience, except what a powerfully cold bath can give him in zero weather. I have broken thru the ice on both Harrison Lake and Two Medicine Lake; each time the temperature was below zero.

Tragedies such as the above are very common in the woods and besides water, snowslides take a heavy toll of elk, goat and mountain sheep. I have found as high as four elk in one slide in the spring breakup at Paola. Moose have been found impaled on sharp branches which they had attempted to jump over. In the winter of 1924, one was found at Nyack, dead from a great wound directly under its forelegs, which no bullet could have caused.

It appears that few wild animals die of old age. Death results either from violence, accident or starvation.

AN INDEX TO 1929 NATURE NOTES

Many subscribers to NATURE NOTES FROM GLACIER NATIONAL PARK have indicated to the editor that they preserve their back issues. For these, a detailed subject and author index to Volume II is being prepared and will be available for limited distribution to those who make application for it before April 1, 1930. There is no charge for the 1929 Index.

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GLACIAL DRIFT

Moose Near Headquarters- Ranger Earl Dissmore first brot to Headquarters the news that a family of three moose, bull, cow, and calf, are wintering on Rubideau Ridge scarcely three miles west of Belton Headquarters.

Changing Conditions; Changed Effect- A deer loitered on the bridge over the Middle Fork of the Flathead River. Two automobiles approached on either side of the bridge; a frightened deer leaped over the parapet, swam to safety. A month later the same drama was laid; a frightened deer leaped over the parapet, landed on ice, broke its neck.

Back Home Again- The park naturalist has been absent from the park for three months, has told people of the Middle West and Pacific Coast of the glories and lure of Glacier National Park and its natural history. Both illustrated lectures and radio broadcasts served as vehicles. For him, the greatest temptation, successfully resisted, was to return to the park while visiting in Seattle on December 7, having made a hurried trip from and back to California. The greatest task was long distance preparation of NATURE NOTES. A cold welcome of 31 below zero was far insufficient to freeze the joy of returning to Belton on the night of January 16.

A Park Naturalists' Conference- Permanent park naturalists met in conference at the University of California during the month of November. Present were Ansel F. Hall, Chief Naturalist and Chief Forester, John D. Coffman, Fire Control Expert, Carl P. Russell, former park naturalist of Yosemite and now field naturalist in charge of museums, Joseph Dixon and George Wright who are studying the predatory animal situation in our parks, Dr. Harold C. Bryant of Dr. Wilbur's Committee on the Study of Educational Problems in the National Parks and who originated the Nature Guide Idea in Yosemite National Park in 1920, George A. Grant, Chief Photographer, and park naturalists E. D. McKee of Grand Canyon, C. Frank Brockman of Mt. Rainier, Frank T. Been of Sequoia, Dorr G. Yeager of Yellowstone, Bert C. Harwell of Yosemite, and G. C. Ruhle of Glacier. Lassen Volcanic was represented by Mr. George Collins. Subjects studied embraced fields such as museum practice, nature guiding, lecturing, exhibits in place, conservation, natural balance, research. Addressing the conference were such authorities as Dr. Joseph Grinnell (mammalogist), Drs. Frederic and Edith Clements (botanists), and A. E. Wieslander (silviculturist).

Nature Notes from Other Parks- Grand Canyon, Mt. Rainier, Yellowstone, Yosemite, and Glacier issue Nature Notes monthly. Crater Lake, Rocky Mountain, and Zion-Bryce Canyon Parks issue numbers during the summer months or at irregular intervals. Sequoia National Park issues a series of Nature Guide Service Press Releases, and Hawaii issues a Volcanic News Letter.

November-December Artwork- With the park naturalist away from the park, R. R. Vincent, Assistant Superintendent, assumed the responsibility of turning the typewritten draft copies of NATURE NOTES into the finished products. Absent from the park at the same time was "Tiny" Paige, Assistant Chief Ranger and staff artist for the Notes. Mrs. Ruth W. Vincent stepped into the

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breach, filled the spaces designated by the distant editor with appropriate drawings, did a very happy, commendable piece of work. Didn't you think the November number was foxy? Weren't the December snow scenes excellent? The editor thinks so and is pleased.

1930 Policies of NATURE NOTES- NATURE NOTES will continue into 1930 the policies established by the present editor. There will be feature articles, poems, sketches, bits of park life, editorials, Glacial Drift. "Who's Who" and "Place Names" will be included as often as space and material will allow. Editorials will be included whenever possible, feasible, urgent. These will remain true to their name: solely expressions of opinion of the park naturalist as editor, not necessarily the general consensus of opinion of the Park Service or of Glacier Park. Many items will be included despite lack of literary merit, for NATURE NOTES endeavors to transmit and preserve the individuality and atmosphere of the park's dramatis personae. Perhaps best of all, Tiny will continue to sketch his scenes and animals, to which Mrs. Vincent will add a helping, skilful hand from time to time. We aim to please. Write and tell us what you like or dislike.

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NATURE NOTES FROM GLACIER NATIONAL PARK

WATER OUZEL—FEBRUARY IS HIS MONTH OF SONG.

FEBRUARY 1930

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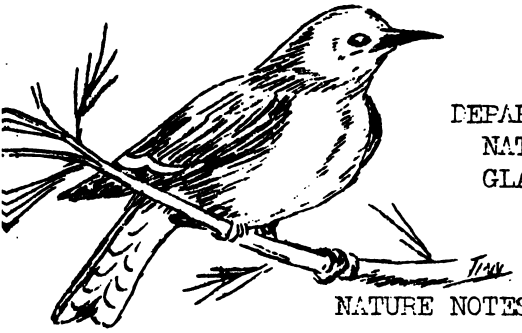

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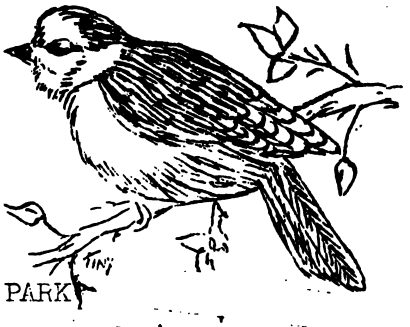

NATURE NOTES FROM GLACIER NATIONAL PARK

Clark Nutcracker — Rocky Mountain Jay

Volume III — February, 1930 — Number 2

A monthly pamphlet edited by the park naturalist and distributed by the Educational Division of Glacier National Park to all interested in the Park and its natural history.

J. Ross Eakin, Park Superintendent — Dr. G. C. Ruhle, Editor

"NATURE IS MORE THAN TRUTH; IT IS BEAUTY AS WELL."

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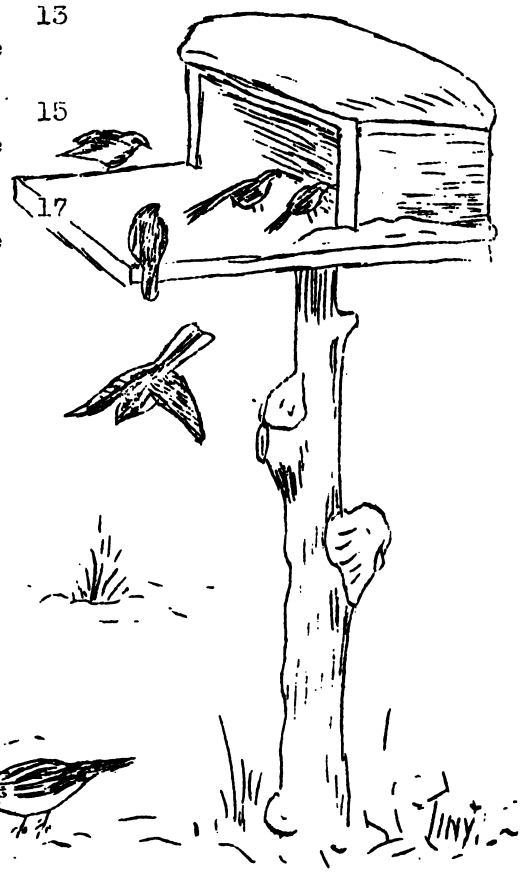
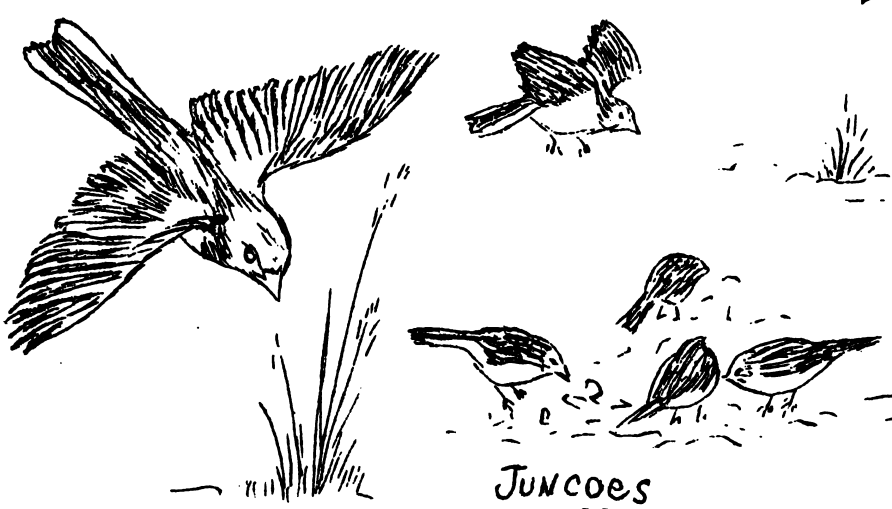
GLACIAL DRIFT 20





JUNCOES

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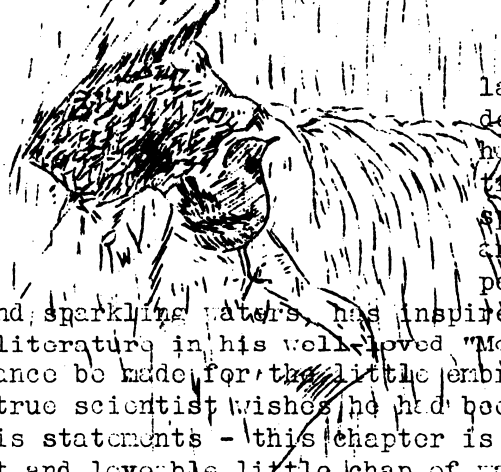
THE WATER OUZEL

G. C. Ruhle, Park Naturalist

"Fade far away, dissolve, and quite forget
  What thou among the leaves hast never known,
The weariness, the fever, and the fret
  Here, where men sit and hear each other groan;
Where palsy shakes a few, sad, last gray hairs
  Where youth grows pale, and specter-thin, and dies;
Where but to think is to be full of sorrow
  And leaden-eyes despairs ..... "
  - Keats, "Ode to a Nightingale."

Thruout the ages, the inspirational power of birds has been acclaimed by song and story. Moreover, literature is replete with such expressions as "wise as an owl", "silly old goose", "blithe as a bird", to the extent that many birds have become symbolic of human attributes, that many birds are known by name to large numbers who otherwise know them not. Within the great mass of what has been written about birds and their faculties, here and there a rare bit transcends the musty realm of the commonplace, crashes into the sphere of the epic and immortal. Is there in all literature a happier description with such astonishing brevity than that of Browning's on the song of the wise thrush? "He sings each song twice over, lest you should think he never could recapture that first fine careless rapture!" Youthful John Keats has eulogized the nightingale among the leaves in the impassioned lines quoted above; poetic Percy Shelley sang deathless words about the skylark springing from earth, higher still and higher, winging the deep blue nearest Heaven, pouring a full heart in profuse strains of unpremeditated art, who singing still does soar, and soaring ever singest.



In our far-western land of Shining Mountains, there is a modestly clad bird whose mahogany song and demeanor has inspired, too: has inspired the weary snowbeaten traveler in the stormy days of winter, has inspired the tired hearts fleeing from the rush and clamor of modern civilization to seek peace and quiet in a land of silent forests and sparkling waters, has inspired a Muir to write an undying classic of bird literature in his well-loved "Mountains of California". Even if due allowance be made for the little embroidering of truth and coloring of facts - the true scientist wishes he had been a little more careful and painstaking in his statements - this chapter is of genuine merit and has introduced the quaint and lovable little chap of water-frequenting habits, has stirred many to seek with fervent desire the montane habitat where dwells this smoothly contoured gallant of the dashing spray.

This is the birds whom John Muir calls "the mountain streams' own darling, the humming-bird of blooming waters, loving rocky ripple-slopes and sheets of foam as a bee loves flowers, as a lark loves sunshine and

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meadows." "No canon is too cold for this little bird, none too lonely, provided it be rich in falling water. Find a fall, or cascade, or rushing rapid, anywhere upon a clear stream, and there you will surely find its complementary ouzel, flitting about in the spray, diving in foaming eddies, whirling like a leaf among beaten foam-bells; ever vigorous and enthusiastic, yet self-contained, and neither seeking nor shunning your company. ... Tracing on strong wing every curve of the most precipitous torrents ..; not fearing to follow them thru their darkest gorges and coldest snow-tunnels; acquainted with every waterfall, echoing their divine music; and thruout the whole of their beautiful lives interpreting what we in our unbelief call terrible in the utterances of torrents and storms, as only varied expressions of God's eternal love."

. . .

On unkindly niveous days when the year is young, the traveler, moving with uncertain step up the precarious icy pavement that leads from Belton to Headquarters, may sometimes catch between the occasional gusts of wind sweeping up the canyon of the Middle Fork the faint rolling music, the exquisite delicate variations from the throat of a bird, with obbligato gurgling of brumal waters streaming down a solid casement. Such mellow, prismatic medley of rolls and trills is scarcely associated with howling winds and falling snow - a scintilla of summer's twilight tranquillity breaking into the madness of winter - a tender strain from Heaven whispered ever so softly, almost inaudibly amidst the blustering reality of frigid existence. It is the water ouzel whose heart is ever attuned to gladness. There on the ice-covered banks of hurrying current he sings and curtsies, as happy as Keats' nightingale or Shelley's skylark, but how strangely different. It is quite one thing to sing while skies are smiling and every one is singing; quite another to sing when all is hushed except the forces of winter and of storm.

And who is this strangely merry fellow that sings away his hours of bleakness, he who inspired Muir and thousands upon thousands of others who have gained his acquaintance in the solitude of the Rockies?

NOTE: This article is being written and included in NATURE NOTES at the request of one of the subscribers who was a guest in the park last summer and a member of a walking party conducted by the park naturalist to the foot of Baring Falls for the purpose of studying the family of ouzels nesting under the waterfall there. A subsequent article will tell of the appearance, habits, and relationships of the ouzel. -Editor

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THE FEATHERED STRANGER WITHIN THY GATES

G. C. Ruhle, Park Naturalist

Orange-crowned Kinglet

Winter-bound residents of Glacier National Park welcome most heartily the diversion offered them by erecting lunch counters for birds in various places. Most everyone has such feeding tables, and the steady drain in suet at the local store is such that the supply scarcely meets the demand. And who are the most common callers at these dispensaries?

Not unfrequently, golden crowned kinglets are callers, diminutive fluffs of greenish colored feathers with wren-like bodies and restless chickadee-like actions. They utter their high pitched tse-tse-tse, and become quite tame, indeed. You will recognize them by black and white eye-brow lines, and a broad yellow or yellow and orange crown stripe. Unlike their nearest relatives, the ruby-crowned kinglets, who are wintering in the southland and who have a loud, distinctive song, the golden-crowned have no song other than the high pitched notes which you hear them utter now. In summer, both kinglets forage in the tree tops and tho often heard are seldom spied, because of their small size, protective coloration, and incessant moving.

Chickadee

Occasionally among the ubiquitous mountain chickadees frequenting the bird tables, a brownish chestnut-backed or, more rarely still, a black-capped, long-tailed individual is seen. Watch carefully for these rarer guests, they do not have the white line over the eyes, tho otherwise they closely resemble the mountain variety. The brownish or rufous wash on the flanks and back will readily serve to identify the chestnut-backed from the long-tailed.

Chickadees are the acrobats of the bird tribe. Like the water ouzel, they sing cheerily on coldest, most blustery days. Their cheerful disposition seems to be a magnet for other birds, as often we find in their company nuthatches, kinglets, creepers, or even woodpeckers. They quickly become very tame--in fact, I've coaxed a chickadee to help eat a sandwich with me. They do a tremendous amount of good, since they require great quantities of food to resist intense cold and supply great energy for their restlessness. Almost seventy per cent of their food consists of innumerable numbers of tiny insect larvae.

The red-breasted nuthatch (little quank) which clings to the corner of an uprights or move downwards, upwards, or across the trunk of a tree is recognized by small size, ruddy colored underparts, a black bar thru the eye, and a conspicuious white eye-brow stripe. This is the birds whose nasal "yenk-yenk" echoes thru the woodland. Try to discover the individual thus calling and you will have a job--for he is a good ventiloquist and blends well with his surroundings.

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Nuthatch.

Juncoes are somewhat larger than the foregoing birds, are true sparrows with slate-colored heads and breasts that contrast strongly with the white underparts. They have conspicuous white outer tail feathers which they flash intermittently with great rapidity as they hop about picking up crumbs.

True jays are omnipresent wherever a feed is in sight, the handsome, noisy Steller jay with black head and crest and deep blue body plumage, and his tramp cousin, the ragged, unkempt-looking, gray and white Rocky Mountain jay. Like other "weary Willies," this latter jay has many picturesque aliases, chief of which are camp robber and whisky jack.

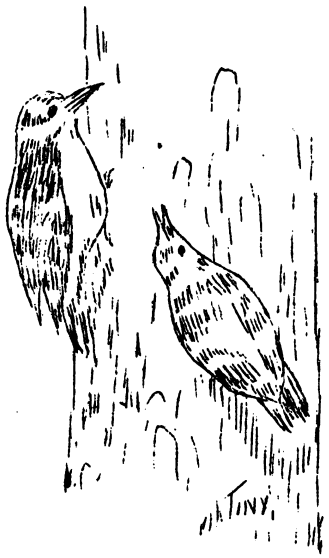
Do not accuse the bold camp robber with another neater, larger, bold gray bird, the Clark nutcracker or crow. The nutcracker has strongly marked patterns in black and white. He has thrifty, storing habits, is a daring thief and noisy mischief-maker withal. In summer he is to be found above tree-line almost anywhere in the park.

Steller Jay

The commonest woodpecker seen in the park during winter months is the Rocky Mountain Hairy with a red patch at the back of the crown, sharply contrasted black and white markings on its back, cheeks, and wings, and solid white outer tail feathers. In the smaller downy or Batchelden woodpecker these outer tail feathers are barred with black. Except for this and his very small size, he is difficult to distinguish from the Hairy.

Three-toed woodpeckers, always rare, are identified by yellow crown patches. The Arctic three-toed is the only woodpecker with an all black back and solidly white breast. The Alaska three-toed has a white stripe down the center of his back like the Rocky Mountain and Batchelder, but this is distinctly barred, giving him the additional name "Ladder-back." I saw both Arctic and Alaska varieties in the park in January.

Woodpeckers are some of our most important birds, since the bulk of their food consists of wood and bark of the larvae borers.



Hairy Woodpeckers

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WANDERINGS AFOOT

Part V
(Conclusion)

Norman Clyde

On the following day Granite Park was reached. This is a charming plateau-like valley between the two high ranges that traverse the park, with forests and groves of spruce and fir and numerous lovely alpine meadows among them. My most noteworthy experience in this vicinity was the ascent of an unnamed peak above Iceberg Lake a few miles to the northwest. In the morning, fog lay heavy in the plains to the east and was sweeping slowly upward toward the mountain crests. Although weather indications were unfavorable I decided to attempt to reach the rim of the great cirque in which the lake lies. After passing through meadows and groves for some time, I followed the shelves of a ridge leading toward my objective. While I hastened on, a flock of some twenty goats scampered along ahead of me and in the same direction, pausing occasionally to look back and then precipitating numerous rocks down the cliffs as they resumed their frightened career. Meanwhile the fog continued to rise and was collecting about the mountain tops. Having reached the summit of the rim I peered over, but the cirque was filled with vapor so dense that one could scarcely see fifty feet down the vertical wall. A heavy wind was blowing and occasionally a loud crackling sound came from the glacier below. I paused a while, hoping that the fog might break away, temporarily at least, but a half hour later conditions were unchanged. While working my way along the narrow crest that loomed through occasional rifts in the fog, the latter did begin to drift away so that the lake could be dimly described far below. Hastening to the summit I arrived there just on time to see the whole mass of fog swept away from the cirque beneath, with Mt. Wilbur and its precipices on the farther side and a turquoise lake full of floating ice, several thousand feet below, formed a scene of almost indescribable sublimity. Repeatedly the fog closed over the peak on which I stood, to clear away for a short time. It was an exhilarating spectacle. Having enjoyed it fully, after throwing up a cairn, as the fog was becoming denser, I decided to begin the descent. Over all the rugged region to the north there was an ocean of snowy vapor, except where a few of the higher mountains protruded above it. Dropping over shelves and after circling about several hours through meadows and forest, I was again in camp.

A day or so later I was winding my way leisurely down toward the Swiftcurrent Valley. Above and to the left toward Mt. Wilbur, encircled by vertical cliffs, as yet unclimbed and apparently unscalable. Viewed from these sides all approach to the summit seemed cut off by unsurmountable precipices, and the fourth was of similar character. All ascent to within a thousand feet of the summit seemed to be comparatively easy, but above that a band of igneous rock, about a hundred feet in diameter extends around the mountain and is in most places impassible. Upon closer scrutiny, however, this diorite

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was seen to be broken about midway around the mountain so as to be apparently scalable. Above it were two narrow chimneys leading to within several hundred feet of the summit. Beyond these were other cliffs, probably unscalable, but which might perhaps be flanked by surmounting and following the crest of a ridge to the right. The latter, although consisting of a series of impassible spires farther down, might afford a means of reaching the highest point. Clouds, however, settled down over the mountain and threatened to prevent any attempt to climb it during the limited time at my disposal. On the following day, hoping that the clouds might clear away, I walked up to Iceberg Lake. After ascending the precipitous face of the mountain about two thousand feet, I wandered along the horizontal shelves which extend around the mountain, and scrambled up several chimneys for some distance. Eventually the clouds began to break away. Following a goat trail, I hastened around the mountain toward the point where I had noted a possible route to the summit. As anticipated, I was able to ascend the band of diorite with little difficulty and then carefully but rapidly climbed, following now one chimney then the other, and again the ridge between them. At length they became shallower and then disappeared, but the cliff receded somewhat. Springing from shelf to shelf, I quickly reached the top of the ridge already mentioned. A walk of several minutes up a gentle slope brought me to the summit. The view was superb. The sky was claar, except for a few fleecy white clouds floating about here and there in the blue heavens. To the north were scores of massive mountains, their flanks chiselled into great cirques by glaciers whose remnants still cling to them and from which streams dash down to profound valleys; to the west, Flattop Mt., a comparatively level timber-clothed basin, and beyond it a line of beautiful mountains stretching away toward an imposing group near the Canadian border; to the south the long array of peaks on both crests; to the east a foreground of picturesque mountains and beyond them, vast undulating plains. Perhaps, however, the most impressive of all is the great amphitheater-like cirque immediately to the north, with Iceberg Lake on its floor, thousands of feet below the rim of encircling precipices. But the sun was low over the western mountains and ravishing as the view might be, I could not linger longer unless I should choose to shiver all night on the shelterless summit. After building a cairn I cautiously descended the darkening face of the mountain and a few hours later was again in camp on the shore of Lake McDermott.

For several days I remained, engaged in climbing a few nearby mountains and loath to leave so fascinating a region. Of many mountain trips, this had been one of the most enjoyable. Except on occasions when I was camped near a chalet or a hotel it was essentially a solitary one in which I depended solely on my previous acquaintance with mountains in various portions of the West. Although a strenuous trip, it has been extremely enjoyable, whether from the delight in mountaineering for mountaineering's sake, which only the initiated can appreciate, or from the association with beautiful and sublime mountains, as a manifold expression of nature in her noblest form. Though the lure to linger longer in this wild free solitude was strong, I reluctantly departed for the homes and haunts of men.

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AMERICAN NATURE ASSOCIATION TOURS

Last year the American Nature Association sponsored three personally conducted Nature tours thru Glacier National Park. As their principle objective was a study of nature and natural history, the Educational Department of Glacier National Park cooperated as best it knew how to make these tours a success. The park naturalist personally greeted the incoming members at Glacier Park Station, conducted them to Glacier Park Hotel to meet members of the Blackfeet tribe with Chief Two-Guns-White-Calf, the Indian whose profile appears on the buffalo nickel. Next they visited the small but complete Glacier Park Fish Hatchery where they were told about fish hatchery practice, its aims and accomplishments. Many already acquainted with the science of fish-catching, were introduced to ichthyology, the science of fishes.

Followed the grandeur of Glacier's front range as seen on the Blackfeet Highway. At Many Glacier, some preferred to take the walk around Swiftcurrent Lake to get their introduction to nature guiding as practiced in our National Parks. "From what he (the ranger naturalist) told us on the very first nature walk, I expected to have the flowers sitting on my lap and shoulders, whispering their life histories and family secrets in my ear," wrote one of the tourists.

Thruout the week a well-balanced programme was presented by a series of evening lectures and trips afield; all of the leading points of interest on the South Circle tour was visited in turn; all of the members of the educational staff met the party, conducted them on nature walks, or delivered talks. One naturalist in particular, a different one for each party, became associated with each tour, remained with it thruout.

The park naturalist was associated with the first party. As an example, the week's programme of his party was as follows:

Monday:	Visit to fish hatchery at Glacier Park; (afternoon) walk around Swiftcurrent lake and to Lake Josephine; evening lecture on park geology; a special lecture by Dr. David White, Chief Topographer of the Geological Survey on "the Geologist's Conception of Time."
Tuesday:	Early morning bird walk; horseback trip to Granite Park; (afternoon) climb up Swiftcurrent Peak; evening lecture on life-zones and the distribution of plants and animals; hike up small neighboring peak for sunset view and chances of seeing ptarmigan and goats.
Wednesday:	Along summit of Garden Wall in search of Alpine-arctic plants and animals; evening lecture on rangers and the National Park Service.
Thursday:	Horseback trip, Granite Park to Going-to-the-Sun over Logan Pass. Evening lecture on the park flora.
Friday:	Hikes to Baring Falls and Sun-rift Gorge with resident ranger naturalist; evening lecture on "park insects."
Saturday:	Horseback trip over Gunsight Pass to Sperry Chalets, stopping en route at Lake Ellen Wilson to fish; evening lectures (2) on park animals, Indians.

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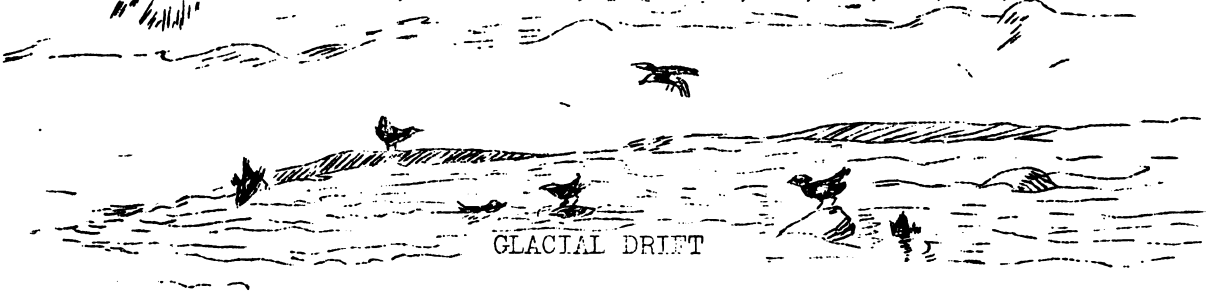
Sunday: Visit to Sperry Glacier; climb up Gunsight Mountain; evening lecture on "Conservation;" program by tour members; camp fire.
Monday: Horseback trip to Lewis' Glacier Hotel for lunch; auto ride to the summit of the Continental Divide over the Transmountain Highway; return to Belton to catch evening train.

So successful were the Nature tours last year* that additional ones will be sponsored in 1930, two over the North Circle and one over the South Circle. The service has also been extended to include Jasper Park, the Inner Passage of British Columbia, Yellowstone Park, Grand Canyon, Bryce and Zion Parks.

* See also NATURE NOTES, Volume II, pages 30, 31, 37, 39, 53, and 60.



GLACIAL DRIFT

A Fish Dinner for an Ouzel- On a late December patrol up the Middle Fork of the Flathead River, I saw a water ouzel over a deep pool of water three miles above Belton. His apparently queer actions aroused my curiosity, so I watched him a short time from the bank. He dived into the deep water, and came up a few moments later a short distance away, bearing something in his bill. As he would take flight if I approached and would carry his find with him, I shot into the ice several feet to the side of him to frighten him away. I discovered that he had a small trout, two inches long, still alive and wriggling altho several pieces had been pecked from his back. Strange to say the ouzel returned to the fish upon my departure, and was left to finish his meal without further disturbance. I have studied these birds as long as I've been in the park and this is the first time I have discovered anything to lead me to believe that they ever caught fish. - G. N. Paige

A Dipper Community- In a January snow shoe trip up Nyack Valley, I saw seven dippers working in a short stretch of open water in the creek. This is out of the ordinary, for ouzels are usually solitary or paired at this time of the year. Freezing of the creek probably forced them to assemble.
- G. N. Paige

Winter Resident Hawk- Chief Ranger Carter reports having seen a large hawk eating a grouse in the aspen forest at the head of Milk River in January. The temperature was four below zero.

Rescue Work by the Chief Ranger- Frequently a broken ski in the deep snows and low temperatures of the northern Rocky Mountains spells disaster, but such an accident to Chief Ranger Carter recently saved a human life. Shortly after starting from headquarters on his annual inspection trip around the park, Mr. Carter broke a ski on McDonald Creek and was compelled to return.

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While awaiting the arrival of a new pair, he decided to reroute his trip to begin with Glacier Park. It is well he did so, for he arrived on Hudson Bay Divide in time to rescue a man from freezing to death.

The man was Eric Soltzenberg, a native of Finland. He had entered the United States from Canada and was instructed by the Customs officer to report to the Immigration officer at Shelby. Without skis or snowshoes, thinly clad, and confused by the strangeness of the country, he had followed the Blackfeet Highway from Babb to the Divide instead of the prairie road that leads to Shelby. For two days and two nights without food or shelter, he had stumbled and pushed his way thru ever deepening drifts, had fought doggedly onward to cover a pitiful few miles. When darkness fell, he would hover about a little fire, moving about every now and then to gather pine sticks for replenishing the fire. To fall asleep was to perish, for the thermometer stood thirty-eight below zero. Without an axe and with only two unused matches remaining, his was a pitiful plight when Carter found him. Nor did the latter immediately comprehend the seriousness of the situation, for Spartan Eric was uncomplaining, afraid to "bother any one." Carter obtained help from Ranger "Andy" Fleutsch of Saint Mary station; together they dragged him four miles thru the snow to the station. Hands, feet, and one ear were badly frozen. But for his wonderful physique and for the fortunate unfortunate beginning of the inspection trip, he would undoubtedly have frozen to death, for no one would probably have passed his way for over two weeks, at least. -J. R. Eakin

Excerpts from January Monthly Reports of Park Rangers- Reports from the east side indicate game has suffered considerably from deep and crusted snow covering the food supply. Many elk drifting out of the pale of protection in the park have been killed by Indians at Saint Mary.

"Small animals are numerous, especially weasel and marten. Game is in good condition on the west side; tho a few poor deer have been seen." (Paige)

"I saw a bald eagle flying over the North Fork, and a lion's track on Bowman Lake." (Paige)

"One hundred and seventy deer feed on the hay provided for them at the Logging Ranger Station." (Lawrence)

Ranger Halvor Lee reports seeing two ptarmigan and several Franklin grouse at Two Medicine.

Earl Dissmore reported seeing Bohemian Waxwings at Avalanche Creek Camp Grounds.

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NATURE NOTES FROM GLACIER NATIONAL PARK

MARCH 1930

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UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
GLACIER NATIONAL PARK

NATURE NOTES FROM GLACIER NATIONAL PARK

Volume III March, 1930 Number 3

A monthly pamphlet edited by the Park Naturalist and distributed by the Educational Division of Glacier National Park to all interested in the Park and its natural history.

J. Ross Eakin, Park Superintendent Dr. G. C. Ruhle, Editor

"NATURE IS MORE THAN TRUTH; IT IS BEAUTY AS WELL."

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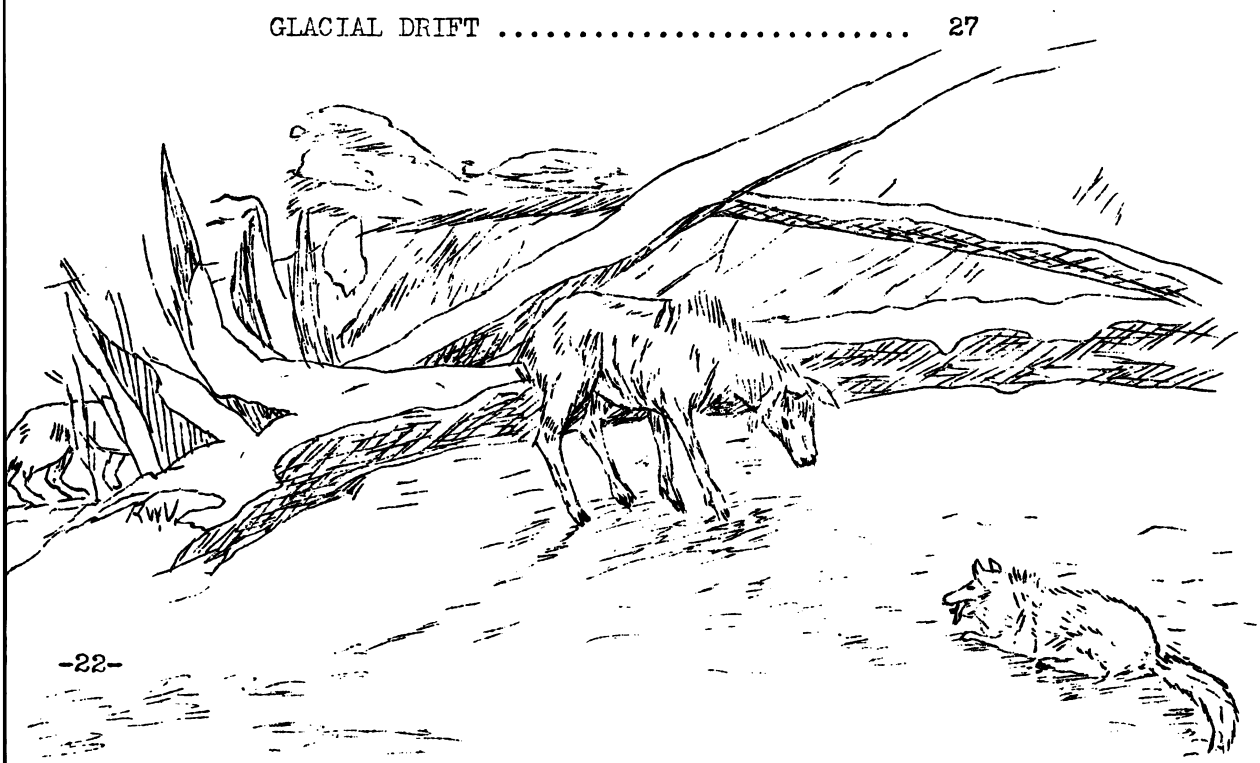

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A NYACK FISHERMAN

George N. Faige, Assistant Chief Ranger

Fairly common thruout Glacier Park, but especially so on the west side is the otter of long, slender body, very short legs, and thick-pointed, flattened tail. During my January patrol of inspection up Nyack Valley, it was my pleasure to overtake one who was engaged in his regular meal of fish. This exceedingly wary member of the weasel family is as much at home in water as on land, and despite his success in avoiding being seen, his numbers have become so greatly reduced that his very existence has been seriously threatened.

For fifteen days the thermometer had hovered around twenty below zero. Nyack Creek was deeply covered with ice everywhere except where the current is strongest. About eight miles above its mouth, alongside a waterfall and a series of cascades, I noticed the signs of an otter who had gone around them on the snow. His course, like mine, was upstream. I kept close watch to catch a glimpse of him, but during the next day, I saw only two places where he had left the ice to travel on the snow. These tracks were much fresher and his general course was still upstream.

The second night of my trip was spent at the upper snowshoe cabin. I started the return trip on the third day, still on the lookout for friend otter, of whom no more signs had been seen. A mile and a half above the lower cabin, the trail ascends a steep bank which caused me to pause for my breath. From this point of vantage, I beheld, scarcely fifty feet away, friend otter popping to the surface of a large hole in the ice, bearing a good-sized trout in his mouth. Without further formality, he proceded to have dinner, devouring the fish in two gulps. As the trout's tail was fading from view, I cautiously reached for my camera, but the otter espied me and slid into the water.

The otter is a great traveler and covers much country. The motion of his slender, flexible body of a uniform brown color is graceful and pleasing. In winter he will travel for long distances under the ice, coming up every few minutes to exhale air from his lungs for refreshing beneath the ice. He inhales it again before continuing his journey. Beaver, mink, and muskrats get fresh air in the same fashion, and will drown if frightened from their air supply under a continuous sheet of ice.

I have followed otter tracks for over five miles from Upper to Lower Two Medicine Lakes. Two years ago I followed another which had come over Lincoln Pass to Lake MacDonald. He had traveled three miles across country without open water. On numerous other occasions, I have seen their tracks, but never before have I been privileged to actually see one in Glacier Park.

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COYOTE TACTICS

G. N. Paige, Assistant Chief Ranger

An ancient buck deer ambled down a beaten path toward the Nyack deer feedyard. The thot of a lickerish, alfalfa-hay dinner within reach was stimulating, but tottering feet were incapable of being pushed further. He lay down upon a little hill for refreshment.

Most cunning and shrewd of park four-footed hunters is the coyote. Never does he move with the wind in quest of prey, unless that becomes part of well-laid strategy. Overtaking the reposing buck by abrupt surprise, two leeward coyotes forced him to try to make a dash for the nearby river for safety. A bend in the trail and a low hill intervened in the five-hundred yard stretch to be covered.

On being discovered, the two predators immediately separated, one vanishing from sight. The second closely pursued his victim, managed to obtain a two-inch bite from the fast-moving flank. Sensing the presence of only one antagonist, the buck turned and easily held him at bay. Now Coyote number two reappeared on the trail, having had time to circle the arena of action and get between the deer and its retreat. The latter, in dismay, sought to escape by dashing by this second antagonist, but received a great tear across his neck in passing. He jumped into a friendly shelter of dense windfall nearby, which protected his rear and permitted his warding off the coyotes with razor-sharp hoofs that nothing dares approach.

Foiled; a new method of attack had to be pursued by the "dogs". Again one lay down, in full view. The second vanished up-trail, circuitously moved to a hiding log down-trail, crouched in patient wait of new developments. A bleeding deer felt strength ebbing fast from the gashes of battle. Once more the permanent safety of the river called, once more he bounded along with a snapping, snarling beast at his heels, keeping attention upon him. The distracted deer hastened towards the concealed enemy who slashed the cords of his hind legs as he passed, so he could run no further. Coyotes feasted on venison, in reward for superior strategy.

Sometime later, I came upon this scene of strife with its fatal story for the deer. It was on my winter patrol of Nyack Valley. Carefully, bit by bit, the tell-tale records in the snow yielded the details, carefully I pieced each bit together to reconstruct the tale of how it must have happened in reality. Well-fed coyotes long were gone - only the carcass of the valiant, torn and bleeding, marked the sad ending.

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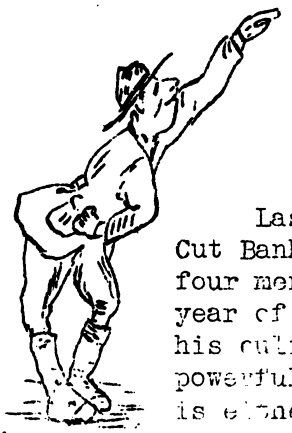

MULLIGAN STEW

Ray E. Newbury, Park Ranger

Last summer, while shoveling snow from the trails over Cut Bank and Triple Divide Passes, the cooking for a crew of four men fell between me and a temporary ranger in his fourth year of Park Service. My associate justly prided himself on his culinary ability, so I must tell you about one of his powerful mulligan stews. You doubtless know that a mulligan is either wilfully compounded of everything no longer wanted in camp, or accidentally resultant of an accumulation. The one under discussion was newly brewed for the occasion and, I secretly believe, with malice aforethought. Just what ingredients found their way into it escaped my watchful eye, as I was busy at the time rustling wood.

At supper the volunteer cook watched the lowering level of mulligan with concern and warned me repeatedly to partake sparingly of it, saying it was "powerful stuff". Having exhausted my reserve shovelling snow that day, I managed to stow away great quantities, heedless of his warnings. I soon became drowsy and flopped on the Yukon feathers shortly before dark.

I had scarcely fallen asleep, only to be awakened by a ringing telephone. The Chief Ranger was on the line; he ordered me to gather and wash all the white goats as soon as we were done shoveling snow. Now, this seemed indeed a bit unusual, and I doubted that I had heard him correctly. On being assured that I had, I started to argue but with very little success. Something couldn't be right, for I previously had always found him reasonable and willing to listen to the other man's say. But he continued more absurdly than ever. On completion of the goat-washing job, I must hunt up Paul Bunyan and have him repaint the faded bands on Singleshot Mountain. I couldn't believe my ears. I had always thot my Chief temperate, rational and sane. I hung up in disgust and went back to bed.

Next morning, I awoke to find there was no telephone in camp. There never had been and probably never will be. Moreover, camp was located over six miles from the end of the nearest telephone line. Was ~~that~~ mulligan powerful? I somewhat suspect that it was.

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CHARGED BY A BULL ELK

Channing T. Howell, Park Ranger

There seems to be quite a little difference of opinion regarding the speed of different wild animals. Some claim that this or that animal can run faster than any other. A coyote may run at a rate of 35 miles an hour, but a bear can run as fast or faster than he. Others claim the antelope is the fleetest on foot. Martin Johnson states that the African lion, when charging, runs fastest of all animals. I disagree with him; I claim the elk is the fastest of all animals, wild or tame. This is one thing that my wife and I agree on, as both of us had the opportunity to match speed with one.

I had promised to show my wife some elk, so armed with a Kodak we set forth. We came upon three cow elk feeding in a meadow above Slide Lake and crept thru the brush toward them until quite close. Two pictures were snapped before they discovered us and broke for the woods. The show seemed all over, but in reality it had only begun. We discovered a magnific nt large bull thirty yards away, who obligingly posed for his photograph, then with an air of ruffled majesty tossed his massive head a few times; this should have been a tip-off to us, but, like people from Missouri, we stood admiring him. Suddenly he charged straight for us. My wife started an immediate retreat, while I stood waving my arms and yelling at the top of my voice, yet he kept right on coming. As it was quite some distance to any trees, both of us had to run faster than Charley Paddock to reach safety before Mr. Elk punctured us. Nor did we have a cinder track to run on either, the ground being covered with brush, to say nothing of numerous cobblestones. My wife, far ahead took turns at running three steps and falling down the fourth, but I shouted advice that I was sure she would cover more territory in less time if she discontinue falling and keep steadily running. We reached the trees and despite her "I do not choose to climb," I am sure she could have made any squirrel ashamed of itself, had it been necessary. When we reached timber, Mr. Elk gave up the chase, and went to join the rest of the herd.

What animal runs fastest? I'll tell the invisible readers the elk runs faster than any other animal that uses four feet; especially if he is headed your way and no trees or cover are handy. Before I became a park ranger I hunted considerably every year, but this is the first time I was ever chased by an elk.

Comment - In connection with Ranger Howell's narrative, it is interesting to recall that William L. Finley of the American Nature Association and Jennings Lodge, Oregon, timed antelope by racing them across a desert lake bed in Southeastern Oregon. The speedometer of his car registered their maximum speed at slightly over 45 miles an hour. Antelope are generally conceded as the fleetest and most graceful of North American game animals. Once abundant on the plain on the east side of Glacier, they were long ago hunted to extinction. It is estimated that less than two thousand of these interesting animals remain of the countless numbers that once roamed the western wilderness. - Editor

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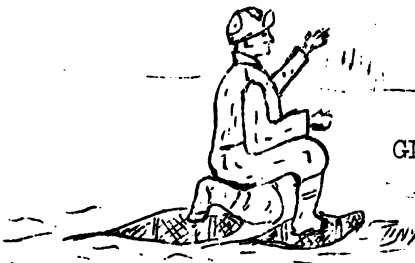

GLACIAL DRIFT

Nick's Coyote Story - I was crossing Lake McDonald on the last lap of my January ski patrol around the park. Somewhere near the center of the lake, I ran across a coyote who skurried rapidly towards shore. I scarcely recall just what was my motive, other than being curious to discover what he would do, as I dropped on one knee and started a series of protracted yowls as nearly like those of a coyote as I could make them. The dog stopped suddenly, about-faced, started coming towards me. I continued as he drew nearer. A half mile intervened, a quarter, soon he was within a hundred yards of me, barking, growling, snarling, with jaws snapping and hair bristling. He moved restlessly and began circling to the windward side of me. Suddenly he caught my scent--barking stopped, tail dropped between the legs, a surprised beast dashed headlong from me. In all of my years' experience in coyote infested territory, I have never heard of a parallel case of a coyote thus being lured closer to a human being by imitative yapping. But, that's my story and I'll stick to it. - F. L. "Nick" Carter

A February Thrush - On the afternoon of February twenty-second, a varied thrush called at the bird table of Mrs. Robert Clack who excitedly 'phoned the park naturalist to come and see. This lover of the timbered solitude is very commonly seen on the lawns at headquarters in very early spring, makes melodious the twilight stillness of forested canyons thruout summer, is rarely seen in sequestered glens during the bonny days of fall, but none of the local people to whom it is so well known recall seeing it during the dead of winter, altho it is reported to linger in lower Flathead Valley.

Flicker - The day after the appearance of the varied thrush, a flicker called lustily outside my office window, the first one I had seen or heard in the park since last fall.

Excerpts from January Monthly Reports of Park Rangers - "All elk have left the park in this district after cleaning up all the willows and other food they could get. A heavy ice crust, covered two feet of snow and rendered foraging impossible. It was strong enuff in places to sustain the weight of full grown bulls. From the most reliable information I could gather, about fifty elk have been killed on the reservation just outside of my district, some Indians getting five or more animals." - Andrew Fleutsch

Ranger Willey reported seeing signs of a wolf in his Belly River District on January 25.

Ranger Howell reported the lowest temperature of the month. It was 46 below zero at Kennedy Creek Ranger Station on January 16. He also was the only one to report seeing mountain goat, being en route to Belly River Ranger Station over Gable Pass on January 25.

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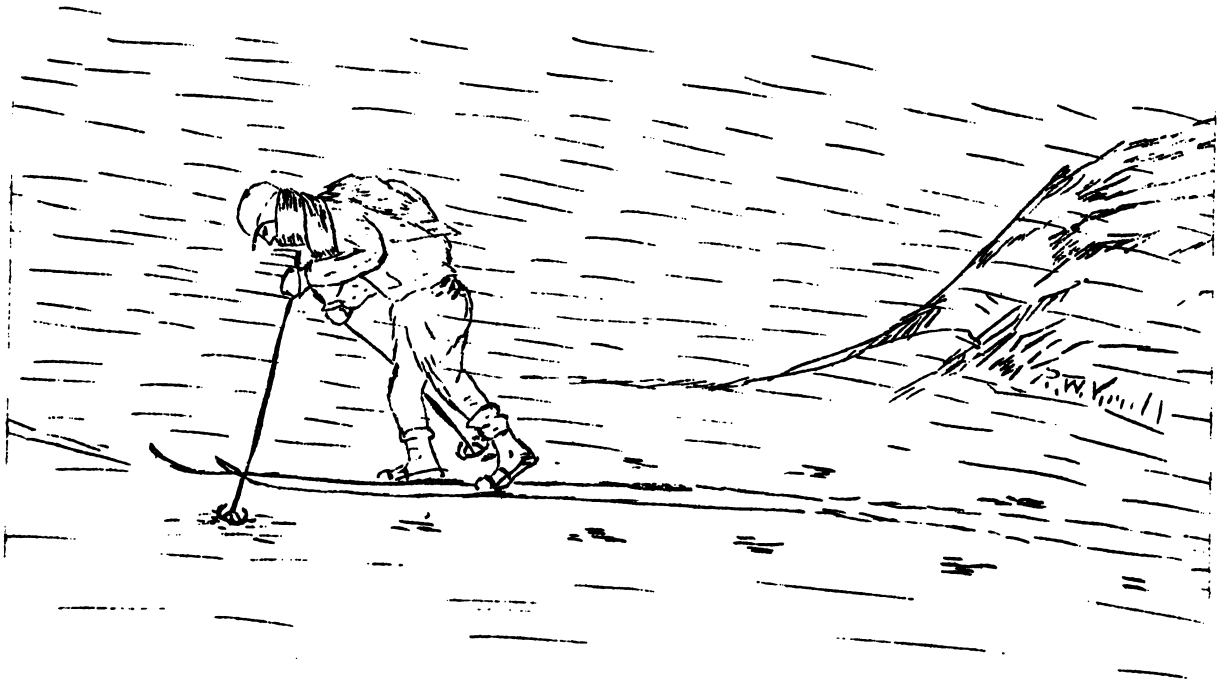
"I have spent considerable time hunting coyotes which are harrassing sheep at Many Glacier, tho I haven't had a shot within three hundred yards, nor have had any success killing any. Coyotes generally confine attacks to small or sickly sheep, and leave strong individuals alone. I saw one ram chasing a coyote at close quarters. He missed a lunge, but trampled a small circle, five feet in diameter, and invited the intruder to battle. I tried to approach the latter, but could not get within one thousand yards. The ram waited all thru the night for acceptance of his challenge, refusing even to leave for a visit to the feed yard. His daunted opponent failed to return." - Ray Newbury

Montana Winds - The Great Plains are justly known as a vast region of unbridled winds. The east side of Glacier Park share this fury with the Plains that surge at its feet. Many a tale has been told of rasping, piercing, shattering winds before which nothing can stand. During the severe cold snap of the winter, storm-bound residents bordering the park were forced to keep all-night vigils, afraid of consequences, should anything go wrong in the unsubsiding gale that dashed on wings of a seventy mile-an-hour blow. Well-known, common "roarin' forties" seemed gentle zephyrs compared with these "roarin' seventies" of January.



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Glacial drift;
notes from Glacier
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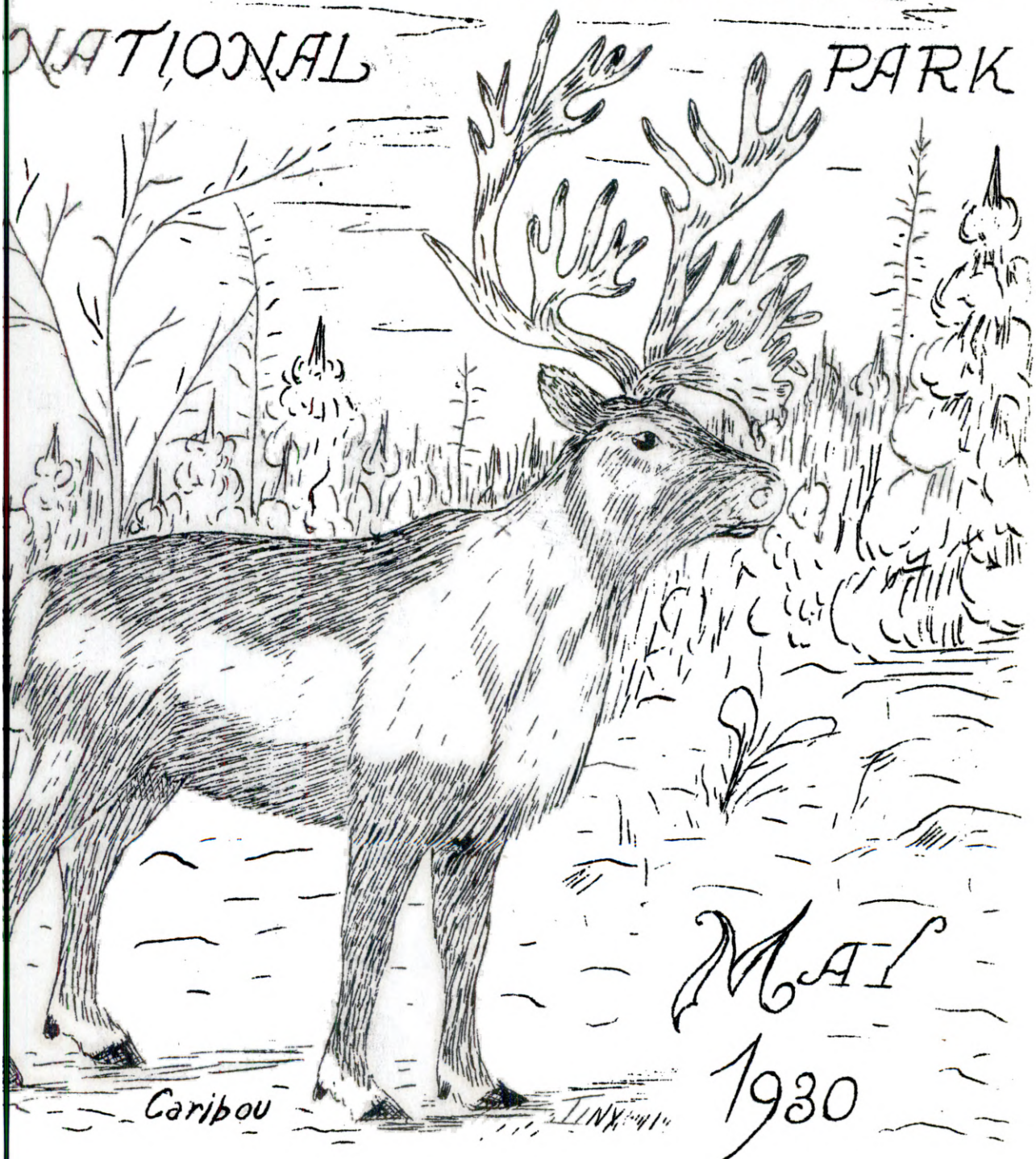
NATURE NOTES FROM GLACIER NATIONAL PARK



MAY 1930

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UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
GLACIER NATIONAL PARK

NATURE NOTES FROM GLACIER NATIONAL PARK

Volume III | May, 1930 | Number 5

A monthly pamphlet edited by the Park Naturalist and distributed by the Educational Division of Glacier National Park to all interested in the Park and its natural history.

J. Ross Eakin, Park Superintendent | Dr. G. C. Ruhle, Editor

"NATURE IS MORE THAN TRUTH; IT IS BEAUTY AS WELL."

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MOUNTAIN CARIBOU

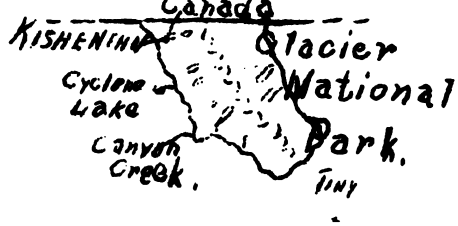
G. C. Ruhle, Park Naturalist

Park Ranger Nelson of Kishenehn District reported seeing a caribou on Starvation Ridge in April, just south of the park boundary. So far as is known, this is the first official report of the presence of that splendid animal within the park, tho it frequently appears in country to the west and north. Ed. Wharton, a firefighter in Blackfeet National Forest, informed me last summer that a trapper named Murphy reported seeing a herd of fourteen near Cyclone Lake, two miles west of the park. Other people substantiated his report, so it is possible that the curious "elk" and "moose" inhabiting the bushy country about Canyon Creek and described by local people were caribou, also. Mr. Puyear, former park ranger of Kishenehn once reported seeing eleven-inch "moose" tracks in his district. These measurements correspond with caribou tracks; the largest moose tracks measure about six inches.

With the sole exception of the musk ox, the caribou ranges further north than any other New World ungulate. It not only roams the forests of the Canadian Zone that stretches across the Dominion, but is also found on Arctic wastes bordering polar seas, on the bleak northern and western coasts of Greenland. The strong, thick legs, the long, cow-like head held low and thrust straight forward, the expanded, flattened hoofs give the caribou an odd appearance, but Nature has well fitted it to withstand hibernal terrors of an Arctic home. The spreading foot-pads permit it to walk over snowfields and muskegs where even the moose would sink and be forced to plow thru. It is the best snow-walker of the whole deer family. Moreover, the strong legs, swinging gait and long stride permit it to wander on long seasonal migrations for climatic and feeding purposes. Only the nineteenth century bison of our larger animals performed longer, more amazing travel exploits. It lives on moss and lichens.

Caribou are roughly divided into two groups, the woodland and barren ground, of which the former are found on the more southerly ranges. Of the nine species found in North America, the Mountain Caribou of British Columbia is one of the handsomest, being large and darkly colored, and bearing well-formed antlers.

Caribou are found in the Bridge and Frazier River Country of British Columbia, near Bend on the Canadian Pacific Railroad and in the Kootenai River Country west of the Park. The Supervisor of the Canadian Forests of British Columbia has said that they are sometimes found just north of the park boundary. Thus it is highly possible that with the encroachment of civilization, the diminution of range and the crowding of native fauna to regions of safety and preservation, this most interesting member of the deer family may some day become a permanent resident of Glacier National Park.



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AN ASCENT OF BLACKFEET MOUNTAIN

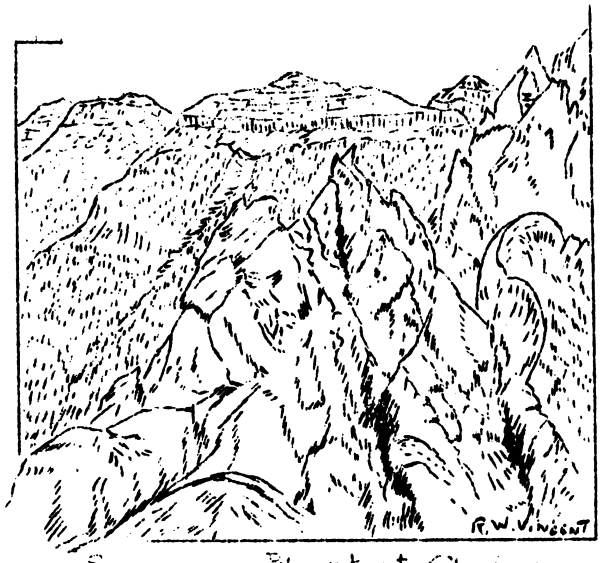
Norman Clyde

Looking northward from elevated view points in the southern portion of Glacier Park, one is impressed by a group of glacier-hung mountains, the most prominent of which is Blackfoot Mountain. Before one, approaching it from the south or standing on nearby peaks, it looms most striking and beautiful in a robe of white glaciers above which a dark summit protrudes but a short distance. One sees a score of tumbling streams emerging from an icy source, cascading down the walls of a great cirque, flowing over verdant slopes to the forested Nyack Valley. Of the two glaciers that clothe its flanks, the north-sloping Blackfeet is the larger, but the more picturesque is Pumpelly which lunges, deeply crevassed, down the eastern face.

I once ascended the mountain from a camp near Gunsight Pass. My route led across grassy meadows sprinkled with alpine flowers; its outlook was inspiring. Directly across the head of the valley of the St. Mary stands the commanding, truncated form of Citadel Mountain. A few miles to the east lies beautiful St. Mary Lake flanked on either side by Going-to-the-Sun, Little Chief, Red Eagle, and other mountains scarcely less picturesque. To the west Mt. Jackson slopes up steeply for thousands of feet; to the south, Blackfeet Mountain rises beyond the glacier. By swinging to the right and crossing a lobe of the latter I reached a saddle between the Blackfeet Mountain and Mt. Jackson. I followed shelves for several miles further and finally climbed directly to the summit of Blackfeet Mountain.

There is a magnificent view from the saddle and along the ridge. To the southeast Harrison Glacier cascades several thousand feet down the steep slope of Mt. Jackson, displaying a myriad of deep crevasses and shattered seracs. Below is a profound cirque with a green valley at its feet extending westward between forest-clothed slopes to Harrison Lake that gleamed peacefully in a sylvan setting. The rugged severity of lofty mountain and snowy glacier is relieved by the expanses of green and blue at the lower elevations.

By walking for several miles along shelves that wound into the recesses of cirques and around projecting points I reached the main peak and gained the summit by scrambling up a few hundred feet over lime-stone ledges. Although obtructed to the north by Mt. Jackson, the view is very comprehensive. The eye follows a maze of peaks toward the southern end of the park where the spire-like St. Nicholas and the massive Rising Wolf and Rockwell stand out conspicuous; southward across the deep Nyack Valley to the imposing



Serac on Blackfeet Glacier

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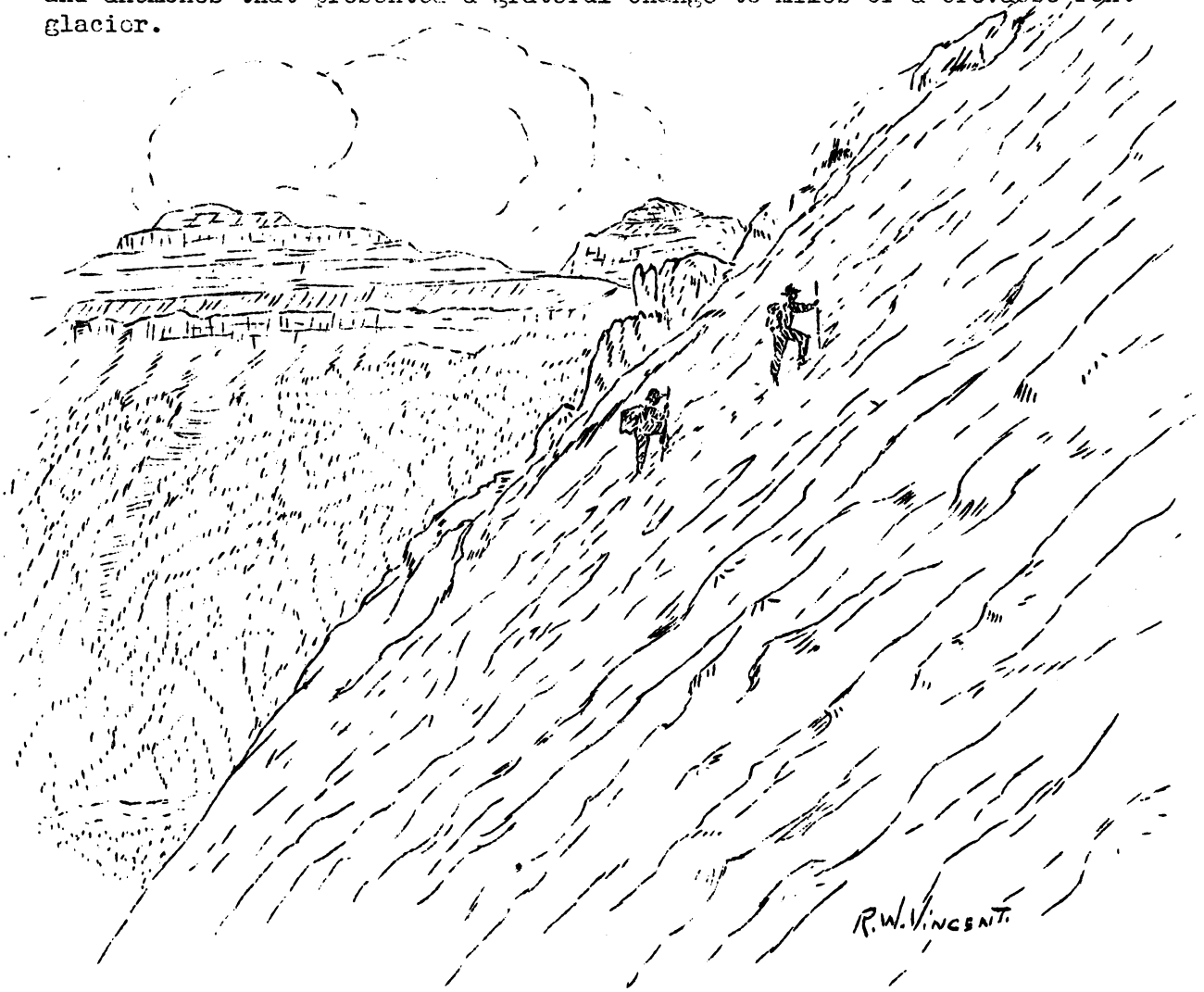
mass of Mt. Stimson; northward, past scores of peaks of the rugged eastern crest. Beautiful weather enhanced the charm of the magnificent panorama. A light wind was blowing, soft cumulus clouds floated here and there in the deep blue sky.

I decided to return by crossing Blackfoot Glacier in a northwesterly direction. As I hastened down the smooth slope, crevasses began to appear, and before long an impassible seracad chasm confronted me. The only procedure was to return some distance and seek a different route or to cross the ice above the serac. I choose the latter, spending some time cutting steps in the ice-slope to an island of rock a few hundred feet distant. The way was then unobstructed until I reached several low cliffs of limestone, which I descended with little difficulty after reconnoitering. Meanwhile, a dense cloud rolled over the mountain sending down torrents of rain. An overhanging rock sheltered me from the shower which gave certain pleasure because of the reverberations of thunder and the driving, sullen clouds that drenched the mountain with a flood of rain. Like many a mountain storm, this soon passed to other peaks and left me to continue around many crevasses and over numerous low ledges down the glacier. I reached the grassy slope of Mt. Jackson, and crossed the meadows spangled with asters, castilléias and anemones that presented a grateful change to miles of a crevasse-rent glacier.



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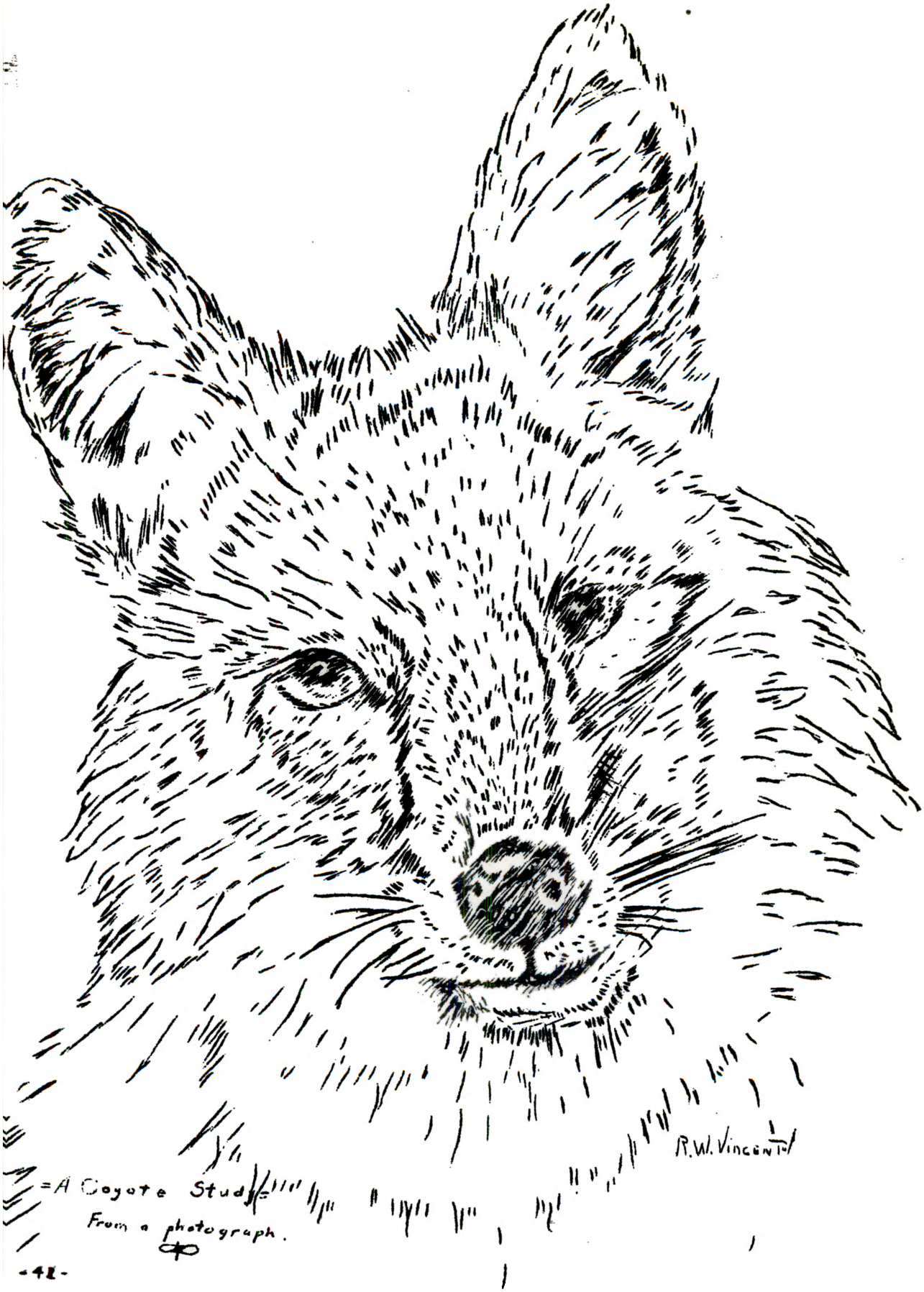

=A Coyote Study=
From a photograph.

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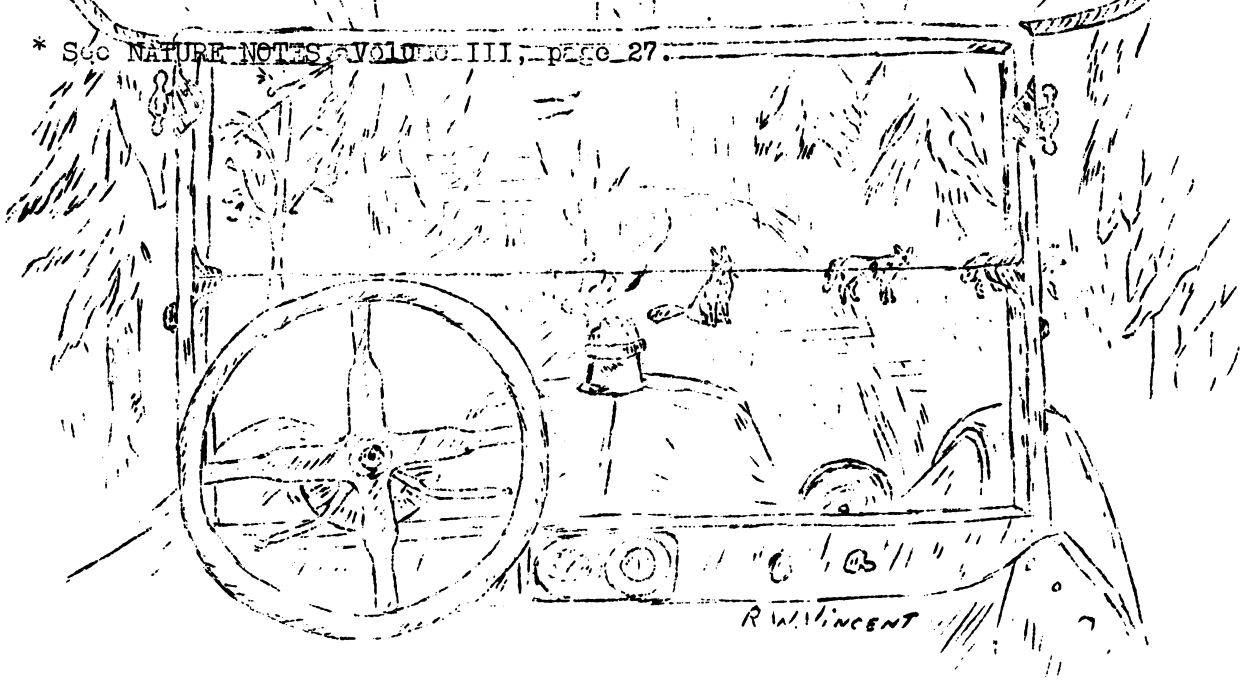
A SEQUEL TO A COYOTE STORY

Arthur Newton Pack, President
American Nature Association

I noticed in Nature Notes from Glacier National Park, for March, 1930, Nick Carter's coyote story.* Mr. Carter will probably be interested to learn that Mrs. Pack and I had a similar experience last summer in the Kaibab Forest. We were driving in our Ford car, along towards dusk, on the road to Point Sublime, when three coyotes crossed the road ahead of us. I stopped the car, and Mrs. Pack immediately began a sort of yowling whine, which she claims to be one of her great accomplishments. Two of the coyotes stopped about thirty yards away. One sat down on his haunches and cocked his ears like a police dog, as if listening to pleasant music. He stayed this way until Mrs. Pack ran out of breath; then, the concert being over, he trotted off after his companions. While I do not believe that the coyote actually came nearer, at least he ceased to run away, and he was near enough to make an excellent photograph, had the light been good enough, which, of course, it wasn't.

Subsequently, we encountered a bob-cat. In this case Mrs. Pack tried a sort of yowling meow, and it worked very well indeed - so well that she was able to get out of the car with her camera and approach the cat to within thirty feet. Whenever Mrs. Pack came nearer, the bob-cat would trot off a few paces and then sit down and look at her again. They kept up this sort of progression until they reached the edge of the Grand Canyon, at which place Mrs. Pack began to recollect stories of cornered wild-cats and abruptly turned and started back to the road. The picture wasn't very good, because Mrs. Pack was so busy meowing and watching the cat that she didn't realize how near she actually approached it, and forgot to change the focus of the camera accordingly. At any rate, I was witness to both of these little affairs.

* See NATURE NOTES, Volume III, page 27.



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THE 1930 GAME COUNT

J. Ross Eakin, Park Superintendent

Vital statistics compiled in Glacier National Park will not be included in the national census figures but are always most interesting to conservationists and outdoor enthusiasts. Chief Ranger Carter, assisted by his staff of rangers, has completed the annual game count. There are now in the park 110 moose, 1061 mule deer, 1656 whitetail deer, 239 bighorn sheep, 439 goats, 486 elk, 105 grizzly bears and 335 black bears.

The greatest mortalities due to such factors as predatory animals and natural causes, occurred among the deer, a loss of eight per cent being recorded. This high rate is largely due to the fact that eighty-five were killed by trains, many more than were ever lost before from this cause. This slaughter is not easily comprehended as there have been much harder winters. Even this high loss is less than the normal increase. The loss of a bighorn sheep was five per cent and of elk and goats less than one per cent. A number of elk were driven out in the Blackfeet Reservation by the severity of the winter and killed by the Indians there, but these have not been included in calculating losses. The number so killed cannot be definitely ascertained but is believed to be between seventy-five and one hundred. Reports have reached the park that an Indian sold elk meat over the counter of his store. Under existing conditions, nothing can be done about it. Very few animals other than elk drifted out on the reservation.

Of fur bearing animals, there are 676 marten, 201 mink, 49 lynx, 39 otter and 587 beavers. Game birds total 350 Richardson grouse, 864 ruffed grouse, 107 sharp tailed grouse, 379 Franklin grouse and 118 ptarmigan.

"Occupation — None"

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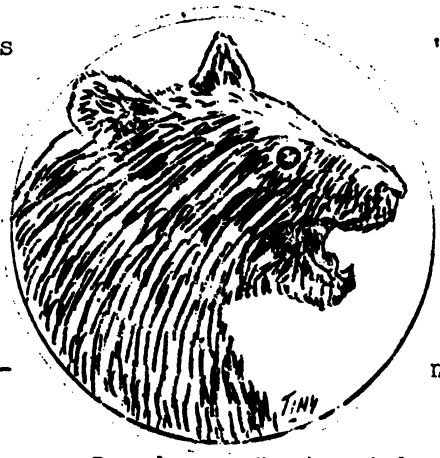
GLACIAL DRIFT

"Bears!" - First signs of a black bear were reported by Ranger Hugh Buchanan of McDonald District who saw some on the road near Logan Creek Snowshoe Cabin. On March 28 he saw more near his station at the head of Lake McDonald.



"A Big One!" - Bert Bealey of the Forest Service, cruising timber on Lincoln Creek reported seeing the first grizzly of spring on March 30: "a big one" three miles above the mouth of the creek.

Halvor Lee's Mink - Ranger Lee has a "pet" mink which will come boldly into his ranger station when the door is left open. Since his appearance in the middle of March, weasels wintering there have vanished. In the small lake bordering Two Medicine Camp Ground, Lee fished thru a hole in the ice, caught a nice Eastern Brook trout, left it lying beside the hole. While he looked for another spot to angle, his friendly mink looked with desire upon the toothsome catch, did not stop with the fish, ate the bait also.

Running Moose - On the afternoon of April nineteenth, I started up the North Fork road on a reconnaissance trip, had passed over Spruce Creek bridge, was driving up the grade when a large, shiney black back moved in the bushes ahead. I drove around an intervening curve as fast as possible and behold a huge moose facing the car. It turned and started on a fast trot up the middle of the road, all the while showering gravel back on the car. When the horn was tested, he seemed irritated, but held to the right-of-way for over three-quarters of a mile before crashing down a steep brush-covered hillside to the creek-bed. The remainder of the trip was much more pleasant for this unexpected encounter with one of the largest beasts of the Park. - Chas. E. Randels, Park Engineer

Adopting Wild Flowers - Naturalizing wild flowers into our gardens at headquarters is most interesting work and we were rewarded by the first bloom, a trillium for Easter. These flowers give much joy for they bloom so very early, are found in most of the States and last so long. All are familiar with the pure white three petaled flower that becomes a rose purple as it fades. Shooting stars are considered a purple flower and I was surprised to find a number of plants with pure white flowers among the purple ones on a hill side. The greatest care was given to a collection of anemone globosa plants transplanted from the east side of Glacier National Park but they did not survive their first winter at headquarters. It is thought that they were too sheltered and need a different location, at least for the first year of cultivation. At present one of the daintiest and most fragrant flowers of the west side of the park is blooming in our garden. Though commonly called a wild orchid, it is a twayblade or ophrys caurina and gives to me as much pleasure as any hot house orchid I have ever received in the city. - Mrs. H. G. Randels

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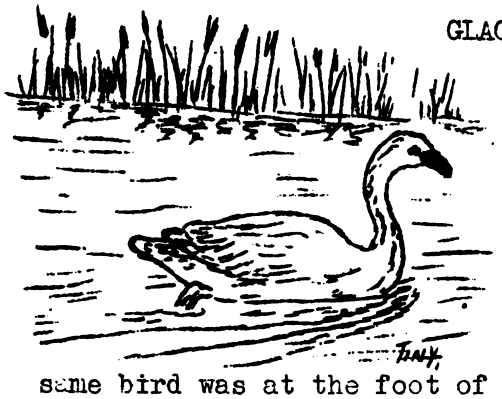

A Trumpeter Swan - On Sunday, April 6, I saw a lone trumpeter swan on the Middle Fork above Belton. It was on the park side, across the river from where we were standing watching it. As it tried to climb up the steep bank, it became evident that it could not use its wings, as other birds would have done in a like situation. Several days later, what appeared to be the same bird was at the foot of Lake McDonald. As school children shied rocks at it, it was apparent that it still was unable to make use of its wings. - Ruth W. Vincent

Many, Many Ducks - On April 21, Mrs. Robert Clack and I saw over two hundred ducks swarm the waters of Lake Five. This was a rare and beautiful sight to us. - Ruth W. Vincent

Birds at the Head of McDonald Lake - Ranger Buchanan saw two varied thrushes on March 23 and a western robin on March 28 near his station. On the latter date, two hundred snow geese honked as they flew thru all kinds of maneuvers and formations below low-hanging clouds, settled at the mouth of McDonald Creek to feed in the open water over night, departed with more honking before dawn next morning.

An Earlier Robin - Spring capriciously flits here and there to linger a six-month admidst the glories of Glacier Park. Long after the Great Plains laving the outstretched spurs of the Rockies have turned a mellow brown in the rich sun-gold of August, when myriads of yellow gaillardias and purple asters wave carefree along dusty, much-travelled highways, she is to be found, shy and retiring, in cool, well-hidden, north-exposed cirques and slopes where dwindling patches of last winter's snows still linger, where silene pinks and windflowers still bloom in the shadows. First to receive the gentle caresses of her life-moving breath are the low, south-sloping ridges in Logging Ranger District on the North Fork. Here, three weeks before a similar arrival at Headquarters (See NATURE NOTES, 3, 36), a robin was seen by Ranger "Shorty" Lorence on February 17. He first saw meadowlarks here on March 7, Brewer blackbirds and a blue bird on March 12. On March 26 a flock of seventeen brant settled complacently on the surface of a small lake in that district to feed.

Recent Bird Observations by the Park Naturalist - On March 30, a Swainson hawk, two bank swallows, numerous canvas-back ducks, mallards and pintails were seen near the western shore of Flathead Lake. On April 3, a leucosticte still lingered near Polson; two killdeers flew across the road near the outlet of the lake. On April 5, I recorded my first chipping sparrow of the year, a red-tailed hawk, a kingfisher, and several ruby-crowned kinglets, all at Headquarters. A song sparrow sang blithely from the top of a birch next day. Ducks and grebes, numerous outside the park in the middle of the month, were not seen inside the park until two weeks later. On the highway seven miles northeast of Kalispell is a small ox-bow lake on which paddled the following birds: (April 16) Western grebes; (April 18) many coots, Barrow golden-eyes, ruddy ducks, scaup ducks, pintails, mallards, eared grebes; (April 20) mallards and American golden-eyes. Meanwhile, on the

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last named day, pipits swarmed the fields nearby, a yellow-bellied sapsucker hammered ambitiously on the cross-beam of a telephone pole, purple finches and a Savannah sparrow were newcomers of the great Sparrow family. In the city park of Kalispell, further birds seen on Easter morning included an Audobon warbler, a winter wren and some tree swallows. Later on the same day, two avocets stalked in the waters of a small grass-edged pool south of Polson, and a pigeon hawk winged a search for food near an adjacent brush thicket.

Enfant Gâté - Regular feeding during severe winter months has corrupted the manners of a certain Clark's nutcracker. Whenever he wants food he pecks at window of my residence until he gets service. The food is given him on a bird table near the kitchen window, and when it is gone, he "tells the world." The snow has left the lower valleys and most of the birds are returning to summer haunts, but this spoiled child evidently wishes to prolong his stay at Park Headquarters indefinitely. - J. R. Eakin

Flying Squirrels - Several flying squirrels called nightly on Ranger Fluetsch thruout the winter months, collected scraps from the garbage bucket in the rear vestibule of the station, looked at Andy with large, bulging eyes, volplaned from roofs or adjacent trees.

A Carrion-eating Weasel - Not only have jays and camp-robbers enjoyed the coyote carcass presented them last winter by Ranger "Andy" Fluetsch of St. Mary Station, but his favorite mouser, a snowy white weasel with black-tipped tail occassionally varied his diet with a bit of the "dog."

Spring Flowers - Easter morning presented a showy yellow fritillaria (yellow bell) blooming alone on the highway leading to the Valley from Belton. On April 22, Chief Ranger Carter noted a trillium which had just shoved its green leaves thru the humus, took the park naturalist to show it off on April 30, found it in all the beauty of flower with two other blossoming companions. A cold rain fell on April 28. On the cold morning following one or two demure yellow violets cautiously opened their buds to be followed by a host of companions on the following day, urged by the warm sunshine of the preceding afternoon.

Lewis' Glacier Hotel Sold - Ownership of John R. Lewis' celebrated hostelry near the head of Lake McDonald was recently transferred to the Glacier Park Hotel Company. The name of the Hotel has been changed to Lake McDonald Hotel. In line with the fixed policy of the government that all privately owned land shall ultimately be eliminated from the National Parks, 285 acres of land included in the sale will pass into the hands of the government. Alterations and improvements are being made on the hotel this spring.

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What the Rangers Reported During March - In late winter, ptarmigan browsed on willow buds near the Ranger Station on the floor of Belly River Valley. (Willey)
Ranger Fluetsch reported a moose in his St. Mary district, "evidently a very large one according to its sign."
Four or five of the score of mountain sheep wintering on Yellow Mountain wandered out on the Indian Reservation and were killed by Indians. (Howell)
Ranger Howell saw a killdeer on the South Fork of Kennedy Creek on March 21.
On March 27, men from the Bureau of Public Roads, R. R. Tipton in charge, moved into their Swiftcurrent camp to resume building operations on the new bridge at the outlet of Swiftcurrent Lake. Coming from Portland, Mr. Tipton drove his car over Crow's Nest Pass in Canada.
Two ptarmigan were seen one-half mile from Two Medicine Ranger Station on March 19. Accompanying these white members of the grouse family was one individual of the darker feathered ruffed grouse. (Lee)
"I saw beaver and otter in Swiftcurrent Creek just below the Falls." (Newbury)
Mallards, harlequins, red-heads, American mergansers, golden-eyes, pine grosbeaks were listed by Ranger Fauley for his Nyack District in March.

"We Enjoyed Receiving These." - Many were the pleasant remarks included with the return of "subscription renewals" following the March issue of NATURE NOTES. Here are bits selected at random from the pack that tickled those who help make the pamphlet possible.

"We certainly enjoy your notes. They are mighty fine in all details ..."
"I not only enjoy NATURE NOTES very much, but value them for the many good records and real Natural History they bring me."
"Your publication is decidedly worth while. It is both entertaining and instructive; each issue is received with considerable pleasure by the entire staff."
"I have enjoyed every number ...."
"We enjoy NATURE NOTES very much, especially the drawings and sketches."
"... The whole family enjoy every page... Each number brings back my visit to the park last summer and makes me look forward to my next visit...."
"...Enjoy especially the bird articles... wish we might have more."
"You bet we want every issue; it gets better each month...."
"Best publication I receive."
"Our children take them to school.....use them in their classes."
"Like your section 'Glacial Drift' best."
".... I read it very carefully from cover to cover."
"NATURE NOTES mean more to me than any other periodical I receive."
".. using NATURE NOTES in our Nature Study Club programs...."
".. The historical ones (articles) ... are always of much interest..."
".. I certainly do not wish to miss a single number ...."

Especially gratifying to the editor were several notes from newspapers indicating that they make use of the articles in "Outing" columns, Sunday editions, and the like, from several libraries that place them in their periodical reading rooms, from individuals that pass them around to several readers. Here's promise of the continuance of endeavor to please.

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NATURE NOTES FROM GLACIER NATIONAL PARK

JUNE 1930

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UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
GLACIER NATIONAL PARK

NATURE NOTES FROM GLACIER NATIONAL PARK

Volume III June, 1930 Number 6

A monthly pamphlet edited by the Park Naturalist and distributed by the Educational Division of Glacier National Park to all interested in the Park and its natural history.

J. Ross Eakin, Park Superintendent Dr. G. C. Ruhle, Editor

"NATURE IS MORE THAN TRUTH; IT IS BEAUTY AS WELL."

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After his men had butchered the cattle of Hyperion, Ulysses, as sole survivor of the shipwreck, drifted to the isle of Ogygia where dwelt the amber-haired Calypso, beautiful, skilled in song, longing for the companionship of someone to love. Delighted with the appearance of the wanderer whom the Gods had washed to her shores; for him she sang softly, gently; for him she wove the richest garments of gold and purple; for him she promised immortality, would he but stay with her forever. Ulysses, dreaming only of Ithaca and Penelope, was detained for seven long years until Jupiter commanded her to dismiss him. He sailed away, leaving her standing desolate on the shore of her golden island. Solitary, too, is the Calypso's namesake of our northern lonely bogs. Single-flowered, scattered, early blooming, this rose-colored orchid is one of the rare beauties of Glacier's woods in early spring time which lures the weary traveler with its enchantment, which compels the lover of nature to involuntarily pause a moment in his wanderings. Once common throughout much of North America, calypsos have rapidly disappeared from much of their former habitat. Botanists have called it *Cytherea*, an epithet of Aphrodite, goddess of beauty.

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OBSEQUIES

"The spirits of the twilight go sighing on these slopes,
After the fire's black tread;
And something like a cry falls where the twisted smoke ascends
Above the forest dead.

The spirits of the twilight go weeping on these hills
That wore at dawn the plume
Of fire aglow and trembling to top of wings and pearly bills,
Dark now beyond resume.

And down where men are walking, so vague and unperplexed,
Some one, half heard, will say
'Old Balsam Cone is done for; I wonder which is next;'
And go the trodden way.

But where hot scars are barren, and long curled moss is black,
Spirits of twilight call
The dry-tongued hounds of hunger, and drought that fevers track
To a forest funeral."

----- Selected.

From "The Observer"
Conservation Commission
Div. of Lands & Forests
State of New York

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THE FOREST FOUR HUNDRED

G. C. Ruhle, Park Naturalist

Compared with the sylvan giants of the humid Pacific Coast Belt, Glacier's trees are small, indeed, but among their lesser brethren of the Northwestern states and Canada, they bear a leading role. Most celebrated is a noteable white pine (Pinus monticola), locally termed the "Lone Pine", which forestry men from all sections of the country have proclaimed to be the largest of its kind in existence. On the shores of singing McDonald Creek, in an open, grassy park, quite unusual for the dense Canadian forests with their tangle of snags and underbrush that extend on every side, this lofty Cyclops towers sublimely one hundred eighty feet above the heavily buttressed base that is ten and one half feet in greatest diameter. Four feet above the ground, its diameter has tapered to slightly less than seven feet; six feet above ground, the diameter is six feet. On the northwest side of the butt, a huge vertical crack appears, from which crumbles a dull brown heart-rot, a sign that this giant has already planted a foot within the grave. Nearby a younger, more sprightly member of its kind towers twenty feet higher, but this has a slightly tapered butt that measures only five feet in diameter, four feet above ground. It is said that in the best white pine country of the West, in northern Idaho, individual trees are sometimes found with a diameter of six feet, while on the Pacific coast, a western white pine over four feet in diameter is a rarity. Nor do they frequently grow over eighty feet high in their high mountain homes of the Sierra Nevada and Cascades, tho their close relative of the Transition Zone, the sugar pine, is reputed to attain a maximum diameter of eighteen feet and a height of almost two hundred fifty feet at the headwaters of the Umpqua in Oregon.

Quite different in appearance, but practically duplicating the measurements of height and diameter of the big white pine, is the largest of a group of a half dozen trees locally known as the "Three Sisters" and as the "Giant Cedars" (Thuya plicata) which are growing on a flat three miles south of Avalanche Creek. A second tree measures six and one half feet four feet above the ground, but its slight taper makes it falsely appear the largest of all. The height of the trees averages one hundred sixty feet.

In the heavy forests at the headwaters of the Waterton, Belly, Swiftcurrent, and St. Mary's Rivers, not a few individuals of Alpine Fir and Englemenn Spruce grow to a diameter of four or four and one half feet. Some of the stumps along the trail from Many Glacier to Piegan Pass show an annual ring count corresponding to an age of several hundred years.

The strong wind of the east-side plays many a trick upon individual trees in exposed situations of Glacier Park. Often it is assisted in its quirks by the crippling and swelling action of fungi. Weird as the trees of an old woodcut are the bent specimens of limber pine on the slopes of Mount Atlyn not far from Many Glacier Hotel. In Two Medicine District,

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one tree has been forced to grow into a complete circle; and has been unceremonisouly dubbed the Donut Nee. Nearby is another veteran, sacred to the Blackfeet Indians who deem it a privilege to be photographed beneath its gnarled and twisted boughs.

LAGNIAPPE

Cassin Vireos - One of the commonest, yet one of the least observed birds around Belton Headquarters in May was the Cassin vireo whose unvaried bipartite apostrophized lyric floated from boughs on every side. His song consists of a two syllable phrase of rising inflection followed by a two syllable and sometimes a third three syllable counterpart of descending inflection, that is, he asks a question, answers it, sometimes adds a comment. Those skilled in turning into words the songs of birds say he pertly, peremptorily orders, "Jimmy ..... come here!" and with impatiency, may add a "Hurry up!" Of vireo-characteristic deliberate mien, he competently, carefully scrutinizes the foliage of trees in which his modest gray plumage of a greenish cast blends into invisibility. The semi-pensile nest, ornamented with spider-egg cases, is placed in the forked branches of broadleaf trees and shrubs.

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BALLAD OF THE SMOKE CHASER

C. J. Palmer
Polebridge Smoke Chaser

Thunder rolling in the hills,
Lightning in the sky,
But no rain a coming;
Everything bone dry.

Telephone bells a tinkling,
Lookout on the wire:
"Get your pack, smoke chaser,
Guess you've got a fire----

"Yes, it's township thirty-three,
In range its nineteen West,
About on section twenty-two--
The smoke will tell the rest."

The chaser grabs his pack sack;
It seems to weigh a ton;
He grabs a passing auto-
Boy! Ain't we got fun!

Bang! there goes a tire-
Good bye Dolly Gray!
Old shanks mare is good enough,
And oft time saves the day.

Scrambling thru the jungles,
Windfalls sure are high--
Wonder who invented packs-
The sucker ought to die!

Compass has the shivers-
Damn thing won't stand still-
Ten degrees east of north--
That lookout he's a pill!

Rip! there goes my trousers!
Like a film I'm sure exposed--
Hello there! September morn,
Where's your pretty clothes?

Phew! there's something burning-
I can sure smell the smoke,
Guess that lookout is all right-
Thought he was a joke.

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Boy! she sure is burning!
Hear that old wind blow!
Let's give her hell Pulaski!
Guess we ain't so slow!

Smoke is something awful-
Sparks they sure are flying-
But I'll try and hold her,
Or bust myself a trying!

Ah! here comes the fire crew-
Welcome to our city!
You certainly look good to me
Now I'm sitting pretty.

Illustration by Palmer
Stencil cut by Tiny.

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GLACIAL DRIFT

From a Letter - "As a matter of strict accuracy, I did not scale the mountain which has been given my name. It was more in the nature of a discovery than a mountain-climbing feat. I was a member of the exploring party which discovered it in 1891. ..... I did however, make the first recorded ascent of Chief Mountain in 1892 and my account is contained in one of the Boone and Crockett Club books published in 1894." (See NATURE NOTES, 2, 13, 1929.)- Hon. H. L. Stimson, Secretary of State.

A Waterton Grizzly - On my way from Waterton Park by boat on April 22, I saw a bear with two cubs on the shore of Hellroaring Creek, a mile and a half north of the International Boundary. The mother bear seemed to be of an enormous size, so I pulled nearer the shore and discovered that she was a grizzly, one of the biggest I had ever seen. Her sides and back wer of a silvery hue; her two cubs were similarly tinged. She was having difficulty in locating the direction of the noise of my motor, for she peered searchingly towards the mountains. I approached within one hundred feet before she discovered my boat. She reared to take a look at me, wheeled around to give one of her cubs a resounding cuff alongside its head, started them off for the timber. She herself took one more look at the boat before retreating after the vanished cubs. This is the first time I have seen a grizzly or its sign as low as the lakeshore in my Waterton District. - Thomas. E. Whiteraf

Friendly and Unfriendly Bear -As a rule the animals in Glacier National Park are not dangerous, but occasionally one can expect to meet up with a bad actor. As I am writing this, a large black bear is out in the yard licking a syrup can. He has been eating from my wife's hand nearly every day. A few days ago as I was working near the cabin, I heard my wife scream; I grabbed a shovel and chased a huge black bear away. Thinking it was the bear she had been accustomed to feeding, she had offered it a biscuit, whereupon it growled and started for her. It was a case of mistaken identity, of feeding the wrong bear. Had she been alone at the time, it might have proved quite serious. -Channing T. Howell

A Grudge? A bear broke into the Sun Ranger Station this spring, broke ten windows, tore out the shower fixtures, smashed half the dishes with a single sweep across the dish rack, played football with a sack of flour until the whole cabin interior was dusted a uniform white. Perhaps he had a grudge against our ranger force and took it out in the sweat of their brow. - F. L. Carter

A Question Answered - "When do marmots leave their hibernation dens in the spring?" queried an eastern naturalist in a recent letter. The park naturalist saw golden-mantled marmots shuffling over the rocks of Blackfoot Canyon near Bonner on April 23. Not until May 14 were our Glacier Park hoary marmots to be seen. Assistant Chief Ranger Earl Dissmore saw the first ones basking in the warm sunshine on the highway a mile above Avalanche Camp Grounds.

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From the Rangers' April Reports - I have counted as many as twelve beaver swimming in a beaver pond near the long corduroy two miles south of the (Waterton Ranger) station. Their bodies were about six inches long; their two-inch wide tails about an inch shorter than their bodies. They played among the willows and grasses within ten feet from where I was standing until they suddenly discovered that I was not a stump or tree. Quickly they scampered to get back to the friendly water and to the safety of their home. - Thos. E. Whitcraft

Several species of birds appeared in the Waterton Lake Ranger District in April. The meadow-lark came first, followed by the bluebird and robin. Mallards, teal, bufflheads and golden-eyes represented the duck family among the earlier arrivals. On the eighteenth five swans paddled gracefully on the surface of Waterton Lake; the next day I saw a kingfisher clattering up the river. On the twentieth, eight blackbirds with large yellow eyes strutted near the head of the lake, while a pair of American mergansers were swimming nearby. A pair of canvas-back ducks, always a rare sight in my district, were seen on the Kootenai Lakes on the twenty-ninth. During the last week of the month a pair of red-headed woodpeckers have been busily hammering at the tree-trunks around my station and surveying the bark for hidden insects. - Thos. E. Whitcraft

Interesting it is to note the fan-like progression of birds up the various valleys of the park. First appearances of robins in various districts on the East Side were reported as follows: At St. Mary on April 3, at Sherbourne Lake and at Two Medicine Lake on the fourth, but not until the fifteenth were they seen around Kennedy Creek Ranger Station. Most complete have been the park naturalist's records of observations on the movements of the bluebird which was first seen near Missoula on the seventh of March, on Flathead Lake the ninth, at Logging Lake on the twelfth. On the east side, one was seen at Spider Lake out on the Great Plains on March 22, at Sherbourne Lake on April 2, at St. Mary on the fifth, and at Kennedy Creek Ranger Station on the fifteenth.

Mayday Moving - For the past five years a pair of Canadian geese have nested on a small island near the Narrows of Upper St. Mary Lake. Consistent with their past custom, they reappeared this year on the first of May to build again their home of former summers. - "Andy" Fluetsch

A Visit by a Bald Eagle - On April second, a full-grown bald eagle was perching on the top branch of a dead tree fifty feet from my station. My wife looked him over with our field glasses, and we found him to be just as interested in us as we were in him. Nor did he seem less interested when I walked over to the tree, swayed it without frightening him, gave up the attempt to flush him. Not until the fog had lifted from the lake and mountains did he leave his tiptop perch to wing a slow flight towards Mt. Cleveland. -Thomas E. Whitcraft

New Arrivals - 1930-born mountain sheep, lambs, mountain goat kids and elk calves appeared in the Park in the middle of May. Proud does brot forth their spotted offspring shortly after June was ushered in. - F. L. Carter

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WHO'S WHO
In Glacier National Park History

4. ISAAC INGALLS STEVENS (1818-1862)† In the history of the Northwest territory, there is no more illustrous name than that of Isaac Ingalls Stevens, soldier and first governor of the territory of Washington. Stevens was born at Andover, Massachusetts, March 25, 1818. He graduated from the United States Military Academy in 1839 at the head of his class. As adjudant of the Engineering corps during the Mexican War, he was severely wounded at the taking of Mexico City. He superintended the fortifications of the Northeastern coast during the forties and had charge of the Coast Survey at Washington D. C. from 1849 to 1853. In 1853 at his own request he was appointed governor of Washington Territory and Superintendent of its Indian affairs. He also took charge of the survey of the territory for the purpose of locating the best railroad route for a trunk line between St. Paul and Puget Sound. His name thus became connected with the earliest dates of Glacier Park history. Under him were such men as A. W. Tinkham, Chas. R. Doty, and Hugh Monroe, the last named acting as scout and guide for his reconnaissance parties in Northwestern Montana. (See NATURE NOTES, 2, 22, 1929.)

In 1854 and 1855, Governor Stevens made treaties with the Indians in which they relinquished title to more than one hundred thousand square miles of territory. He terminated these in October by the establishment of lasting peace with the Blackfeet Indians. In January of the following year, disgruntled Indians caused Governor Stevens to call one thousand volunteers and force them to surrender after a short campaign. He resigned his governorship in 1857 to accept election to Congress.

In 1861 Lincoln appointed Stevens Colonel of the 79th Regiment of New York Volunteers, the "Highlanders," which were depleted at the first battle of Bull Run. In September he was appointed Brigadier General. On New Year's Day 1862, General Stevens achieved one of the first successes of the United States army at Port Royal Ferry, South Carolina. On Independence Day following, he was advanced to the rank of Major General. As such he took part in the second battle of Bull Run and in the skirmishes on the Rappahannock and at Manassas. On September first at Chantilly, "Stonewall Jackson had flanked the Federal army and was about to throw his troops on the retreating men when General Stevens hurled his scanty, inadequate column of six regiments against the attacking body, broke and forced back Jackson's center division, saved the army from great disaster. As his troops wavered under the terrific fire, Stevens rushed forward to the leading regiment, his old "Seventy-nine," seized the colors from the mortally wounded bearer, called upon his Highlanders to follow. In the moment of brilliant victory achieved thru bravery he fell, clutching within his dying grasp the flag of the Union he loved.

† Not to be confused with John F. Stevens, discoverer of Marias Pass in December 1889, chief engineer of the Panama Canal in 1905, head of the American Railway Advisory Commission and Minister Plenipotentiary to Russia in 1917, recipient of the John Fritz (Engineers') medal in 1925, whose bronze statue of heroic size is to be seen by passing tourists at the Great Northern station of Summit, on the south boundary of Glacier Park.

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PLACE NAMES
of Glacier National Park and Vicinity

14. LAKE MC DONALD - Every summer for time immemorial, the tribes of Kootenai Indians gathered upon the evergreen-clad, mountain-hemmed shores of a great, deep lake to kindle the ceremonial fires whose leaping flames cast glidin, interweaving shadows of lithe bodies that moved in weird, fantastically rhythmic motions to measured beating of tom-toms and ululations of the participants. This was a place hallowed to them; this magnificent blue lake that in calm reflected the stately splendor of surrounding peaks and forest, that in storm tossed angrily white-capped waves against its gravelled beaches, this was their Sacred Dancing Lake. (J.W. Schultz)

In about the year 1878, Sir John McDonald, famous Canadian statesman, crossed the International Boundary with a party and blazed a trail to the beautiful lake, which was called Terry's Lake on the earliest maps. Not long thereafter, it was visited by another of the same name, but of no close kinsmanship, or acquaintance, Duncan McDonald, son of Angus McDonald who was with Sitting Bull in the many wars which that chieftain waged. With a party of Salish Indians, Duncan had been commissioned to take a huge amount of supplies into Canada. He had planned to follow the broad valley of the North Fork of the Flathead River, only to find its passage blocked by unfriendly Indians. He, therefore, shifted his course to the eastward, travelling the adjacent parallel valley. At close of day, the party came to the shores of a beautiful lake; here they camped all night, and here Duncan carved his name upon the trunk of a hardwood tree. Next day he resumed his journey and successfully evaded the party of Indians that waited in ambush for him.

The tree bearing Duncan McDonald's name remained standing for many years near what is now the site of Apgar. Visitors saw the name upon the tree by his campsite, spoke of the lake in terms of his name, until gradually it acquired it permanently, Lake McDonald.

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NATURE NOTES FROM GLACIER NATIONAL PARK

JULY 1930

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UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
GLACIER NATIONAL PARK

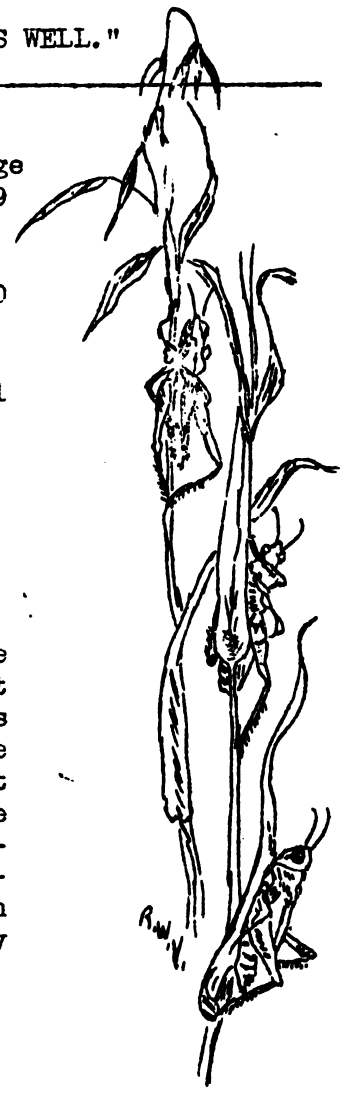
NATURE NOTES FROM GLACIER NATIONAL PARK

Volume III July, 1930 Number 7

A monthly pamphlet edited by the Park Naturalist and distributed by the Educational Division of Glacier National Park to all interested in the Park and its natural history.

J. Ross Eakin, Park Superintendent Dr. G. C. Ruhle, Editor

"NATURE IS MORE THAN TRUTH; IT IS BEAUTY AS WELL."



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One of the outstanding pleasures lavished by Nature upon the Glacier Park visitor this year is the great abundance of beargrass that lines the roadsides, makes glorious the winding trails, clothes the slopes of the mountains. Most conspicuous and noteworthy of her great hordes of wild bloom, this was chosen by popular voice as Glacier's Park flower in 1929. Another glory, noticeably absent last year, is the great numbers of swallowtail butterflies and sphinx moths which brighten with life this million-acre flower garden, so resplendently blossoming this season.

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OUR RANGER

J. D. McDowall

Our dapper young ranger is not such a stranger,
He's of people that we like to know.
He's clear-cut and clean, with eyes that are keen,
And he's ready his favor to show.

His khaki sun-hat - of shape round and flat -
Is jauntily worn on his head -
Authority in him rests and he's much self-possessed
And he walks with a martial like tread.

He stands by the way, violators to stay.
Of information he has a great store.
He's ready at beck, the weak to protect -
He compels all the ladies to adore.

Uncle Sam calls him son - can't see why 'tis done -
For a nephew to an uncle must be,
But he's a dutiful boy, what e'er name you employ.
He belongs to the "Land of the Free".

He likes a good joke, when you fun at him poke -
Gives a roar that is meant for a laugh.
He's a glutton for toil, will in scrimmage embroil
When such duty's prescribed by the "staff".

Our arrival he marks when we enter our parks,
Looks us over with many a glance.
We give him good heed and he gives us God-speed,
As he makes way for us to advance.

But wherever we go, we find comfort you know,
When we see our fine ranger about.
In times of distress he'll disorder suppress.
We're quite sure, him we'd not be without.

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STRIPES AND RUFFLES

Mrs. Margaret Lovely

"Hey! Stripes! Did you taste the cocoanut cake we had at Camp 10 today? I'll be sorry when the outfit is ready to move!"

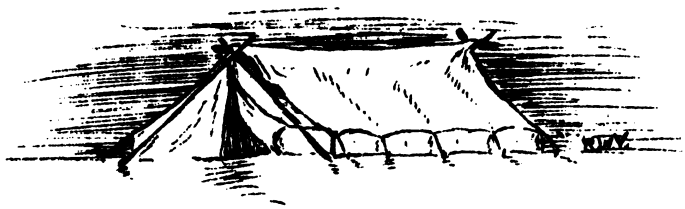
"Move? Who's going to move? Don't you know, Ruffles, that we are Camp 10?"

"Yes indeed, I heard the cook tell the foreman yesterday about that vision of the future - beautiful permanent camps, lodgepole lodges built of material now burned as rubbish, in rustic artistry, and fitted for the use of these road builders from season to season. Beautiful! Blending with the landscape; fitting into their wilderness setting; proving a delight to the worker and a comfort to the road-weary traveller. Then we'll fix up nests in the roofs, Stripes, and be at home all the year round."

"They say the view from the Polebridge grade is as fine as any to be had. Art Blankenship and his men have been making Herculean efforts to get it in shape, and the finishing touches are being put in by Sullivan and Brayton. It is an unusually good piece of road, over a mean little hill, and gives a most inspiring glimpse of the magnificent sweep of the North Fork with its terraced banks of forest green."

Stripes and Ruffles, two friendly chipmunks, make their home at Camp 10. Their domestic arrangements are conveniently placed so crumbs and scraps travel ceaselessly and a fine larder is in preparation for leaner days. Such cheerful, merry little folks; they are playful as kittens and romp about, almost seem to laugh. They know a thing or two, believe me, as to the trend of events.

Lone Pine meadow is very fine now under the bright June sunshine - the grass is tall enough to have a ripple in it as it bends in the south breeze sweeping over it. Stripes and Ruffles tell me it will soon be a landing field for passing planes - a roomy, green field, so clearly visible from among the dense forest of lodgepole pines. It is of ample area and a smooth even slope - it seems ideal.



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SQUIRREL FOOD

- Ralph C. Teall

The visitor to any of the passes on the eastern side of the park has abundant opportunity to become acquainted with Golden Mantled Ground Squirrels. It is doubtful, however, whether many visitors have the strange experience of being selected by these squirrels as a choice and juicy morsel for the noon meal. This was my experience on a recent trip to Piegan Pass from Many Glacier Hotel.

It was probably the first trip over the pass for the season. A great many snow drifts still lay on the ground. Food was scarce and there was a superabundance of squirrels, not only Golden Mantled but also Columbian Ground Squirrels. As I sat down in the trail at the pass to study a map, I was surprised to feel something nibbling at the seat of my corduroy trousers. I was even more surprised to discover a pair of Golden Mantle squirrels licking and occasionally taking a nibble at my shoes. Though many other things were tried the shoes remained prime favorites. In an unguarded moment one of the feasters began to lick and to attempt chewing a finger. This was so good that the squirrel seized it with his forefeet and could be lifted from the ground before he would give over this juicy tidbit.

The success of the Golden Mantles seemed to encourage a wandering Columbian Squirrel. He was much more fastidious in his tastes for he scorned a finger, took a single nibble at a pencil but a good bite of the eraser at its end, and then settled down to a goodly meal off the edge of the spread out map. As dessert a few nibbles at a gray wool shirt were sufficient.

Meanwhile the Golden Mantles had essayed the shirt, the corduroy pants, the socks and the bare legs above them, but each time returned to the staple article, shoe lickings.

Squirrels have long enjoyed a reputation as being herbiverous.* This experience suggests that in time of need they will choose whatever is at hand.

* But it is a common sight to see them preying on others of their kind who have been run over by passing automobiles on the highway. - Ed.

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THE 1930 NATURALIST STAFF

Ranger naturalists are scientists carefully chosen from a large number of applicants for their intimate acquaintance with nature and their enthusiasm in aiding others to know it as well. It has been necessary to expand the naturalist service in Glacier this year to more adequately meet the demands of the Park visitors. For the first time, a naturalist now serves park guests stopping at Two Medicine. Evening lectures in a rustic amphitheatre near the auto camp ground and all-day hikes have been added to the program at Many Glacier. There are six ranger naturalists on the staff.

Millard E. Peterson of the State University of Montans is back at his old post at Lake McDonald Hotel. He is serving his third season as naturalist in the Park. David R. Goddard, botanist, comes to the Park from the University of California where he has received his bachelor's and master's degrees. Dr. James Vernon Harvey serves visitors sojourning at Two Medicine; he received his education at Mississippi, North Carolina, Harvard and Wisconsin Universities. Willard T. McLaughlin claims Dartmouth as his alma mater, teaches botany at the University of Wisconsin, is lecturer and nature guide at Many Glacier. Maurice B. Nichols, ranger naturalist at Going-to-the-Sun Chalet, served for seven seasons on the naturalist staff of Yosemite National Park before coming to Glacier. He is a graduate of the University of Wisconsin. Ralph C. Teall, in charge of exhibits, is a graduate of the University of California, served on the Yosemite staff in 1928 and 1929.

* * * * *

Ask a Ranger Naturalist!

The Badge of Service

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GLACIAL DRIFT

Morels - Residents in Glacier Park this year canned many gallons of tasty morels, considered from early historic times as one of the choicest of edible fungi. As these fungi grow especially abundant on burned forest lands the year following the fire, copious quantities could be gathered this spring from the thousands of ash-covered acres surrounding Headquarters, could be preserved to grace many a savory dish when wintry winds blow again.

Lysol Bath - Mountain sheep at Many Glaciers have been bothered much by wood ticks. Two cases of paralysis in yearlings were caused by them. Some men at the bridge camp bathed one in lysol solution. By morning it had recovered. On June 5, Mr. R. W. Fleming brot in a yearling to the ranger station that he had found prostrate in the road. An application of bacon grease was sufficient to put it on its feet again.

- Ray E. Newbury

Luckless Grouse - I found the nest of a ruffed grouse on Lee Creek. Twelve egg shells and a quantity of feathers, large and small, were mute evidence of a fine meal by some intruder. Another nest that I located had suffered a similar fate except that the bird evidently escaped with its life. - Channing T. Howell

Moose and Horses - I saw two moose on the morning of May 16 mingling with my horses and apparently very tame. The horses appeared not to notice them, and roamed all about, unmindful of their presence. This was in my Nyack ranger district. - Clyde C. Fauley

Masters of the Trail - While riding saddle horses on the trail across Rogers' Meadow, my wife and I encountered three moose, one a large bull, which blocked the way. We tried to circle around them but they refused to let us do this. We approached the bull which was closest, but at twenty feet he showed signs of fight and we were forced to retreat out of sight. We tried again after five minutes of waiting but again they objected to our progress. Again we dropped out of sight, this time waiting for thirty minutes. Our next approach found the restrainers gone.

- Hugh W. Buchanan

Mountain Sheep on the Garden Wall - In travelling along the Transmountain Highway in June, I counted seven sheep on the slopes of the Garden Wall. These are the first I have seen or heard of in this locality for several years. Tho formerly abundant here, it is thot that they were frightened to other parts by dynamiting and activity associated with the building of the highway. - J. Ross Eakin

Mountain Goat on the Transmountain Highway - During May and early June several people saw an old Billy near the switchback on the Transmountain Highway. He cavorted and tried on the smooth surface of the road his feet which are so accustomed to clinging to precarious ledges that skirt Glacier's precipitous cliffs and chasms.

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Glacial Drift;
notes from Glacier
National Park.

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August 1930

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NATURE NOTES FROM GLACIER NATIONAL PARK

SEPTEMBER 1930

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UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
GLACIER NATIONAL PARK

NATURE NOTES FROM GLACIER NATIONAL PARK

Volume III September, 1930 Number 9

A monthly pamphlet edited by the Park Naturalist and distributed by the Educational Division of Glacier National Park to all interested in the Park and its natural history.

J. Ross Eakin, Park Superintendent Dr. G. C. Ruhle, Editor

"NATURE IS MORE THAN TRUTH; IT IS BEAUTY AS WELL."

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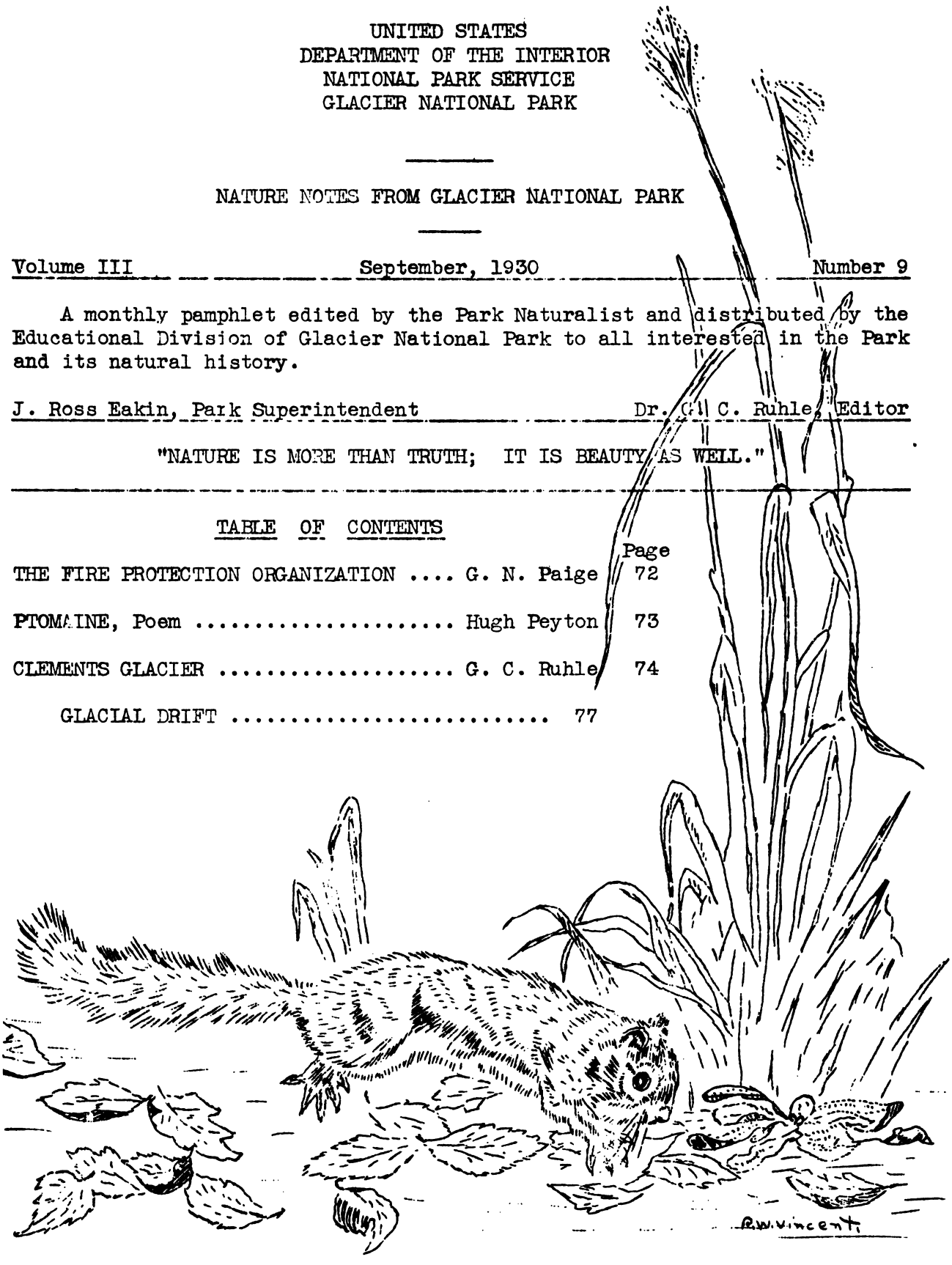

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THE FIRE PROTECTION ORGANIZATION

George N. Paige, Fire Chief

The heavy rains of September practically eliminated forest fire hazard in Glacier Park; by the middle of the month the last look-out and the last smoke-chaser could be discharged from duty.

Glacier Park this year had look-outs on seven prominent peaks which overlooked most of the forest regions of the park where fire hazard is greatest. These were on Indian Ridge, Huckleberry Mountain, Apgar Ridge, Mount Brown, Loneman and Elk Mountains, with an auxiliary look-out at Granite Park. It is the duty of a look-out to scan the surrounding country for a smoke that may betray the presence of the demon, fire. Upon spotting such "a smoke," he takes its compass reading and phones the information to Central Headquarters. From Headquarters, the information is telephoned to other adjacent look-outs who report whether they can also see the smoke. With the assistance of an azimuth map, accurate compass readings from two look-out stations completely determine the exact location of a fire. Look-outs likewise communicate their estimations of the size of the fire, of the number of men needed to successfully cope with it. Generally the first man dispatched is the smoke-chaser of the district in which the smoke is spotted. He is equipped with compass readings from adjacent look-outs to assist him in finding the fire. In densely timbered areas, his pathway is blocked with snags, fallen timber and brush which make his job far from easy. Eighteen such smoke-chasers and fire-guards were hired in 1930. In addition to these and the look-outs, there were two dispatchers and the fire chief on the roll. The nineteen permanent rangers in the park are subject to call for fire duty at any time. A force of one hundred fifty men are kept busy on road and trail crews to be used as fire-fighters whenever exigencies develop. More men are added to these from outside sources whenever necessary. Eight hundred men were being used to fight the great 1929 fire.

There were eighty-six fires reported into my headquarters this season as compared with fifty-nine last year. Thirty-two of these eighty-six were on park land; the rest were in forests bordering the park. Last year a brush and grass fire at Lubec occurred as late as the latter part of October.

The general public is gradually becoming educated concerning fire hazard and the need of cooperation with park officials. Careless campers and smokers are growing fewer; less antagonism is being shown toward smoking regulations and restrictions necessary during critical periods. In addition to this very important factor, the annual increase in our personnel, the extension and improvement of trails, the improvement and acquisition of fire-fighting equipment, the extension and development of an adequate telephone system, and the perfection of the organization itself will tend towards fewer and fewer disastrous fires.

A tabular summary of the fires reported by the fire organization in Glacier Park is appended herewith:

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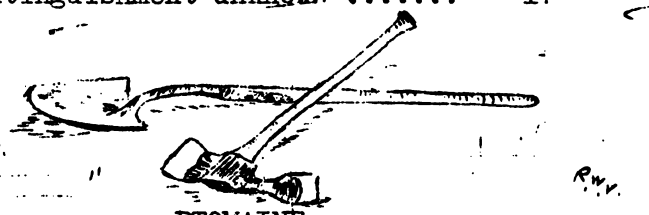
	1930	1929
Fires set by lightning	27	32
Fires set by smokers	13	13
Fires set by campers	14	8
Fires set by burning brush and rubbish .	13	7
Fires started by lumbering operations ..	2	1
Fires, miscellaneous, caused by man	15	15
Fires, cause unknown	2	2
Fires put out by rain	7	5
Fires put out by protection force	36	42
Fires put out by Forest Service	26	17
Fires outside of park, method of extinguishment unknown	17	14



PTOMAINE

Hugh Peyton, Park Ranger

Comment: This is the time that heavily laden pack horses are making the annual tote of canned goods, onions and spuds (for Mulligan stew), bacon and ham, dessicated eggs, flour and baking powder. Their destinations are the various snow-shoe cabins sprinkled thruout the park. The weary, hungry wayfarer can make a corking meal in short time provided he be equipped with a good can-opener, and not be tortured with misgivings like the following. Temporary Ranger Peyton was stationed at the snow-shoe cabin on the South Fork of Kennedy Creek in the spring of 1930.

Pardner, take heed! Slaken your speed
As to these cans you draw near.
Tread humbly the boards; these might have been Fords
If Fate hadn't twisted them here.
Look close with your eyes! Be wary! Be wise!
They might sting like a rattlesnake's fang,
For Demon Ptomaine can rake you with pain;
Could send you to Hell with a bang.

You may put your whole trust in a moldy old crust;
You can bluster a mad she-bear;
You can pin full faith in the good luck wraith
That hangs by a gambler's chair;
Can believe in the smiles of a girl that beguiles
While alluring light gleams in her eye;
But old ptomaine is quick; and South Kennedy Creek
Is a lonely old place for to die.

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CLEMENTS GLACIER

G. C. Ruhle, Park Naturalist

Against the bold eastern face of Mt. Clements rests a small unnamed glacier that straddles the Continental Divide. Because of its nearness to the present terminus of the Transmountain Road on Logan Pass, this glacier is probably more accessible than any in the park to the visitor who has not the endurance to hike or ride horseback for many miles. The distance from the end of the road is less than a mile and involves a climb of only six hundred feet, all of which is very gentle and easily made with the exception of the scramble over the loose rock of the moraine.

Tho this tiny ice mass, called Clements Glacier in this article for want of an official name, has a surficial area of one hundred to two hundred acres only, it shows a large number of the characteristics of great glaciers; it is worthy of a visit by any one who is at all interested in glacial phenomena. Circling the glacier and removed from the edge of the ice by a distance of several hundred feet is a fine moraine, over fifty feet high in places. Its outer base is crossed for a short distance by the trail to Hidden Lake. This loose rock has been plucked from the face of the mountain by the ice of the glacier, or has tumbled off the vertical cliffs by weathering processes. The top of the moraine shows successive longitudinal ridges which appear to have resulted from successive pushes of the glacier, but which probably are more prosaic accumulations of talus tumbling down in winter or early spring over the surface of seasonal snow that fills the entire basin within the enclosure. Thruout my recent visit to the glacier, talus was continually scaling from the rock cliffs, sliding over the top of the ice.

If one looks at the component parts of the moraine, one finds that the rocks are smoothed and grooved. Between the larger material is much smaller aggregate, some as fine as powder. One finds that the bare unbroken rock floor within the moraine is also polished and grooved; it is not hard to see that the striations and polish of the moraine boulders and old glacier floor must have been produced mutually, the one movable, gripped in the frozen superincumbent mass under tons of pressure, grinding, abrading, grooving and polishing the immovable bed, and at the same time, becoming abraded, grooved and polished itself. The rock strata are almost horizontal here, so that the glacier bed is terraced; the beautiful purple-red argillite steps having rounded, stricted edges.

In the early part of the park season, the surface of the glacier is smooth, unbroken and covered with snow. When September comes, it is quite different, being broken by huge lateral cracks and ridges known as crevasses. These are characteristic of true glaciers, and are caused by the scant flexibility of ice moving over an irregularly surfaced bed. In early September of this year, several of the crevasses along the northern side of the glacier terminated at the edge of the ice, and could be entered with safety. One could look at the ice walls towering twenty feet high, could see beautiful blue banding parallel to the surface of the glacier. This banding is caused by surface melting and freezing into clear ice;

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less compact ice crystals below contain some air occluded between them and are rendered opalescent by the reflection of light from their innumerable tiny faces. Everywhere the glacier appeared stratified. Wherever the surface of the glacier becomes soiled dark bands alternate with bluish-white bands of ice. A layer of accumulated snow is covered with dust, dirt and talus during summer while it is gradually thinning as it melts away. Dark colored fragments become concentrated into a thin layer which is covered by clean snow during the following winter. With increasing depth and incident pressure, the snow changes to glacial ice, ever maintaining its alternate dark zones. Like the annular rings of a tree, those indicate, approximately at least, something of the yearly increment of a glacier. Fringing the base of the ice, several small lakes exist which are cloudy like soapy water. Their murkiness is caused by the rock flour formed as the glacier works in the grinding of rock against rock; glaciologists term it "gletschermilch," a particularly befitting term which means "glacial milk."

Elsewhere along the border of the glacier are other huge openings into the ice mass which are known as ice caves. Some are ten or more feet high and fifty feet deep. Rock is a better conductor of heat than ice; the glacier has melted most rapidly where it has come into contact with its bed. Some adjacent caves have grown until they have partially merged to form huge natural bridges of ice. Upon entering an ice cave one can appreciate the real beauty of the translucent blue color of the ice. The ceiling is serratedly ridged, each projection sending downward a trickle of water when melting is most rapid. Rocks are seen encysted in the ice; the floor is strewn with loose pieces of rock, striated and smoothed like those making up the moraine. As a workman lays down his tools at close of day only to pick them up again next morning for more work, so has the glacier laid aside its tools until such time that it can pick them up again upon resumption of its activity.

The heads of most glaciers rest in horseshoe-shaped amphitheatres called cirques that are formed by the ice mass plucking away and eating back into the mountains that generate it. Clements Glacier rests in no such cirque; it reposes directly against the precipitous, almost planar face of the mountain, which rises to a height of almost one thousand feet above it.

A glacier is ever pulling forward and downward in its course. This results in its breaking away from the mountain on which it rests or from the snow field that gives it birth. Consequently, yawning gaps are found at the heads of most glaciers. These vast openings are known as bergshrunds. Clements Glacier has a magnificent bergshrund thruout its width.

Near the northern side of the glacier was a fine example of an ice well or moulin this year. This is a circular, vertical hole in the ice, in this case, about three feet in diameter. Down its sides plunged a gurgling stream of water that apparently emerged further down the glacier to leap over the side of a crevasse in a splendid waterfall. Moulins are ground or melted out by surface water plunging into a crack in the ice. Ofttimes they are many years in forming.

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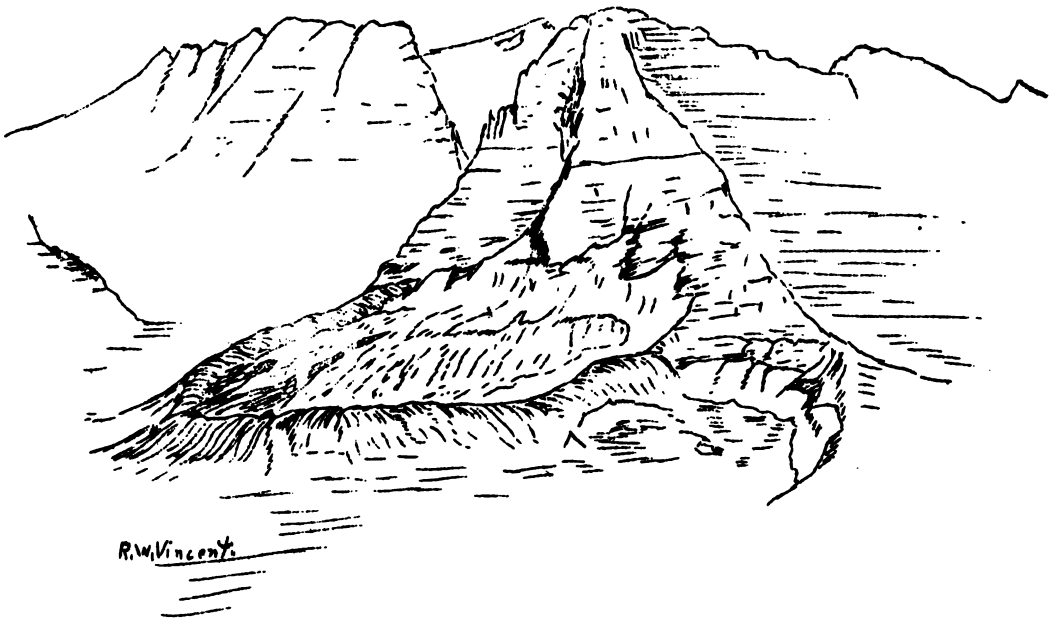
Clements Glacier is composed of two portions, the southerly portion being very narrow, merely lining the edge of the cliff. Part of its drainage seeps thru the moraine to flow into Reynolds Creek and so on to Hudson Bay; part flows into Logan Creek and eventually reaches the Pacific Ocean thru the Columbia System. That it was originally much larger than it is today is evident to every one who visits it; that its rate of recession is very rapid is easily observed from the fact that it has shrunk so far from its big moraine, that the surface of the bed exposed within the moraine still shows all signs of being very recently laid bare. A photograph taken in 1913 shows the ice mass as occupying practically the whole area within the moraine enclosure.

* * * * *

The 1930 Season - Over 5000 people accompanied ranger naturalists on field trips, 15,000 listened to their instructive lectures. Altogether, 48,134 were directly reached by some member of the educational staff during the past season in which 70,514 people entered the park.

Exit, Bell Bear - Much interest was shown the note in Glacial Drift of last month about the bear who was the unwilling recipient of a bell-bearing leather necklace. At first she did not know what she should decorously do about the unwelcome gift that clung so unshakingly, clangorously to her being. Her startled cubs straightway disclaimed, ostracized, shunned the obstreperous company of their mother, a most unbearlike action for bear yearlings. But time heals: soon the bear grew accustomed to the thing, soon apparently grew to wear it with pride, soon frolicked again with her offspring. Surprising it was to the road crew to discover her minus her object of distinction, just a bear shorn of former glory, nosing about the camp garbage.



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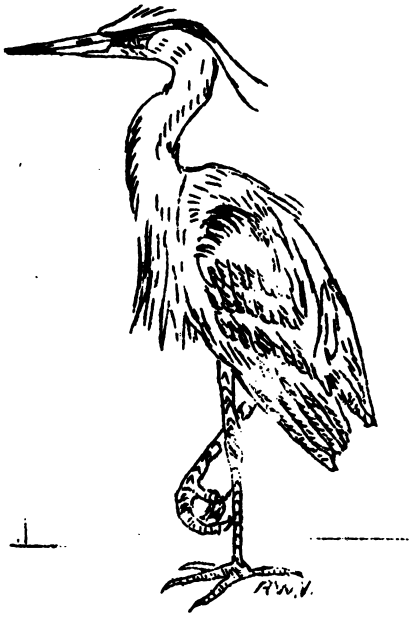
GLACIAL DRIFT



Sagacious Advice - "For an educational vacation, you can hardly beat a National Park." - Lee Shippey in Los Angeles Times, September 8, 1930.

Heron Fledglings - Daily, park visitors passing along the Two Medicine Road saw and admired a great blue heron, standing erect on the edge of a little pond below Dawson Creek. He and his mate had haunted the bullrush-fringed pool since June. Proud must have been the mother bird as she appeared one day with a brood of young; lonely a few days later when only she and her mate were to be seen. The cause of the disappearance of the brood was probably not very far away from the hapless adults; mink, very plentiful in the vicinity, would not long distain an easy meal of rare heron fledglings.

- Clyde C. Fauley, Park Ranger

Adaptive Beaver - Much has been written about the intelligence of the beaver; much has been said about their skill as engineers. That they are also adaptive to their surroundings, that they will not always rigidly adhere to the habits and customs of their ancestors is demonstrated by the fact that a family has taken possession of the Goathaunt Dock (Waterton Lake), that they are storing their winter supply of food there.

- J. Ross Eakin

Coyote Pups - My wife and I were riding along Kishenehn Creek accompanied by our airdale, Judy. Suddenly the dog disappeared into the brush. A little while later she reappeared in the trail ahead of us leading two young coyotes. The pups played with the dog for a quarter of a mile or so, certainly knowing that we were following about fifty yards back, but apparently unafraid and unconcerned over our presence.

- Harry W. Doust, Park Ranger

Dawdling Ground Squirrels - Before August has faded into September, Columbian ground squirrels, sleek and roly-poly, have already sought the darkness of subterranean shelter for an eight or nine months' sleep. The trouble seems largely with the rodent's appetite; he is gluttonous and poorly informed on vitamines. It is my opinion that they become lazy witted as they grow fatter and less spry; that they seek hibernation's safety to escape their numerous enemies when corpulence induces somnolence. These dawdles might well learn from the spritely forest chipmunk who so regulates his diet that he needs go into a comatose state only when snows blow and winter sets in earnestly. - Clyde C. Fauley, Park Ranger

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OCTOBER 1930

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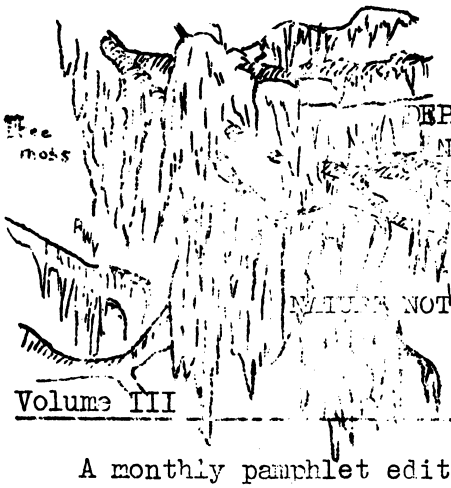

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MR. EAKIN LEAVES GLACIER

One of the most enthusiastic workers that the Naturalist and Educational Service in Glacier National Park possesses is about to leave us. Superintendent Eakin has answered the call of greater service and efficiency, and has accepted the Park Superintendency of the Great Smokies of Tennessee and North Carolina. Young and unestablished, this new playground calls for a powerful administrator who is well-acquainted with the requirements for greatness in a National Park. Our best wishes and sincerest gratitude accompany Mr. Eakin in his new position. Replacing Mr. Eakin will be Mr. E. T. Scoyen, Yellowstone-born, former Chief Ranger of Grand Canyon National Park, now Superintendent of Zion and Bryce Canyon National Parks of Southern Utah.

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THE LAND OF MOVING MOUNTAINS

G. C. Ruhle, Park Naturalist

The tourist approaching Glacier National Park from the East sees rising precipitously from the gently undulating surface of the Great Plains a mighty mountain wall of jagged snow-covered peaks. Before this mighty barrier, thrust up so abruptly, are very few low-lying hills such as are characteristic of most mountain regions thruout the world. Nor do these mountains retain either their ruggedness or their absence of foothills for any great distance to the north or to the south of the park. What can be the origin of this formidable cremate mass with its individuality, its brilliant coloring and its imposing nature?

The beginning of the story of the region dates back over 80,000,000 years ago in what geologists call the Algonkian Era. A vast, shallow sea extended over the park area which was bordered by a rugged continent, Cascadia, on the northwest, by low-lying terrain on the east in what is now Central Montana. Into the quiet waters of this sea were washed the mud and silt from erosional processes; at times, too, its waters teemed with simple organisms that left great quantities of calcareous ooze on its level floor. Thus were deposited in nearly horizontal layers enormous beds of clayey or limy sediment. As the winds played over the waters, they gently rippled their surface, and that of the flocculent beds just below. Under heat of summer's suns, the waters receded, too, leaving exposed muddy beaches that cracked as they baked into cake-like masses, or that under favorable conditions received the imprints of rain-drops pattering down upon them.

Years, centuries, milleniums were passing; thicker and thicker grew the sediments upon the ancient floor. Meanwhile the bottom of this great Cordilleric sea was sinking also, permitting a thicker and thicker accumulation of deposits. When climate and other factors permitted, myriads of limestone forming organisms thrived to leave behind the structural material of future mountains. At other times, only the silt from borderlands was carried into the sea. It has been estimated that over 35,000 feet of sediments were deposited in the Montana region during the Algonkian Age. Above these were laid the beds of succeeding geologic eras, among which was that very interesting one found exposed east of the park mountains today, a bed composed largely of oyster shells.

With the passing of time, the sea withdrew from the great trough that extended thruout the Rocky Mountain area. Thru the enormous pressures of superincumbent material, the beds of sediment hardened into horizontal rocky strata. The region became dry land. But the crust of the earth is nowhere absolutely at rest. Geologists have much evidence that the earthball is gradually shrinking. As its surface gets smaller and smaller, great wrinkles or folds develop. Rocks, however, are relatively inelastic, and in many places, break under the stresses set up by shrinkage or otherwise. So too, the strata in the Glacier Park region were wrinkled and folded; so too, great fractures occurred that parallel its two mountain regions of today. Meanwhile, increasingly great pressure was being exerted on the rocky block from the southwest, a pressure that grew so irresistible that the strata gradually gave way under the

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strain; a huge mass was not only uplifted as a gigantic mountain range, but also shoved far over the beds adjoining it on the east, presenting the lofty mountain wall with an absence of foothills that is so striking.

A fracture of the earth's crust with slippage of one portion with respect to an adjacent portion is known as a fault. A horizontal thrusting of a faulted block over another is known as an overthrust. From the mountain range that was formed by it, the local overthrust fault is termed the Lewis Overthrust. It is traceable thruout the entire length of the park. The horizontal encroachment of Mountain over Plain which must have occupied millions of years is estimated as having been at least fifteen miles in this region.

Greater overthrusts thruout the world are known to geologists. Our own fault possibly extends as far south as the vicinity of Helena, and as far north as Canada's Rocky Mountains Park. But nowhere is there a fault which is so readily apparent to the others besides physiographers; nowhere one that can be so easily traced for such a great distance.

Interesting it is to trace the building of the mountains in the Glacier Park area; interesting it is to wander in the park viewing the brilliant green and red argillites laid down so many eras ago, which are marked by ripples and rain-prints, or bear the casts of salt crystals precipitated at a time when the sea was salty; interesting it is to search for concentric coralline concretions, the earliest forms of life known and found in these earliest of sedimentary rocks; most interesting to trace behind all the hand of the Almighty Sculptor who has here fashioned some of the noblest scenic features of the world.

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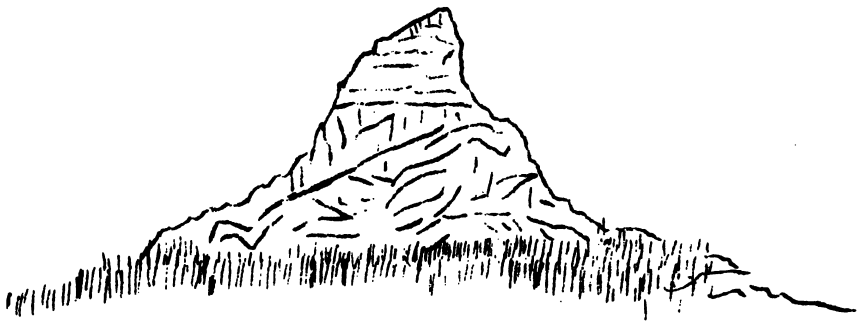

THE PROW OF THE MOVING MOUNTAINS

CHIEF MOUNTAIN has been cut off from the main mountain ridge by ordinary erosional processes. Beneath its mass of ancient rocks lie younger strata which also form the surface layers of the Great Plains.

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BEARD MOSS

G. C. Ruhle, Park Naturalist

"Normally the crowns of coniferous trees are not highly inflammable, that is, green needles must be dried out and superheated by intense flame before they ignite. Once ignited, however, they burn fiercely, and especially under a favorable wind or draft, may create enuff lateral heat to carry fire from crown to crown producing the running crown fire. Crown fires are almost sure to occur in any type when the branches and trunks are heavily laden with moss of any kind. During the heat of the day moss becomes exceedingly inflammable, carries fire up trunks like a train of powder, and in tops forms tinder for ignition. ... It is bound to result in a crown fire if a single strand catches during heat of day." (From Western Fire Fighters' Manual.)

Heavily festooned with moss are the trees in many sections of Glacier National Park. With its graceful vertical lines waving in the slightest breeze, tree moss enhances the charming solitude of the forest, but it ever remains the menace in times of fire as delineated in the previous paragraph. It is sometimes suspected of shade-killing its host.

There are two common beard mosses in Glacier. Black moss or Squaw-hair is very abundant in dense woods and damp places. It grows most luxuriantly on Douglas fir, sometimes trailing from the limbs a foot or more, sometimes covering a small tree from top to base. Often it is observed hanging upon dead branches which it has killed by shutting off sunlight. Like mistletoe and other arboreal plants, it has at various times and places been regarded with esteem, and one wonders if its botanical name, Alectoria fremontii, was not taken from alectorian, the fabulous stone found in the gizzard of a fowl and possessing marvellous virtues.

Grayish or straw-colored beard moss is common thruout Canadian Zones everywhere. It is sometimes called "goatsbeard", tho I have heard that term used for Alectoria also. Its botanical name, Usnea barbata, signifies barbed moss (Usnea from oshnah, Arabic for moss). It superficially resembles the common Spanish moss which hangs in masses from trees in the Southern states and whose specific name, usneoides, designates moss-like or Usnea-like.

Neither Spanish moss nor beard mosses are true mosses. Spanish moss is a member of the Bromelia or pineapple family of flowering plants. Usnea and Alectoria belong to the great class of plants called lichens, which are not individual plants but are formed of a fungus and an alga, very unlike each other, but living together in such intimacy as to appear like a single plant. The algae found in various lichens sometimes occur as individual plants, also; the fungi, highly specific, are always associated with their particular algae in the various lichens, so far as is known. Under a microscope, the threadlike strands, hyphae, of the fungus are seen closely enclosing the unicellular algous plants, forming a compact combination that can often exist under conditions of extreme exposure, and can obtain footholds in places where neither alga nor fungus could live alone.

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OCTOBER IN GLACIER HISTORY

Even as October may be considered the birthmonth of America because Columbus first saw the coastline of Antillean islands on October 12, 1492, despite the fact that Lief, the son of Eric, had probably strode the mainland of the continent five hundred years before, so may October also be considered the birthmonth of Glacier's history tho the region was probably previously seen by the Belgian deSmet and certainly visited by the Scotch Piegan, Hugh Monroe (See NATURE NOTES II, 22). In September, 1853, the esteemed and prominent Blackfeet chief, Little Dog had informed members of the survey party of Governor Isaac I. Stevens about a broad pass over the Continental Divide at the headwaters of the Marias River. From some superstition of the Indians, it had not been used for many years, tho formerly it was the principal thorofare thru the mountains. Owing to the lateness of the season, it was decided to postpone exploring the region. The mountains were crossed by a more southerly pass and camp for the winter set up in the Bitterroot Valley From here, Lieutenant A. W. Tinkham, civil engineer, was dispatched with a Selish guide to hunt for Marias Pass. His guide conducted him up the west side of Flathead Lake, up the Middle Fork of the Flathead, and up Nyack Creek and over the summit to Cut Bank Valley, this being the route then most generally used by the Indians in passing between the Flathead Valley and the Great Plains. Years previous Indians had used the trail over the true Marias Pass. Powerful bands of marauding Blackfeet had forced them to abandon it for one further north. The trail over the Marias fell into neglect; fallen snags and growth of brush impeded progress; no one used it any more. Understanding only the fact that Tinkham wanted to reach the Plains by a hunting trail, the Selish guide, perhaps still haunted by a Blackfeet bogie, led him, not over the pass which he was seeking, but over the one then in general use by the Indians. The exploration of the true pass was to remain unrealized until almost forty years later. As given in "Explorations and Surveys for a Railroad Route from the Mississippi River to the Pacific Ocean", Volume 1, of the War Department, Tinkham reported his trip as follows:

"This Flathead river is ascended to its forks, about forty-two miles above the lake, and the trail then follows up the most eastern fork. At twenty-eight miles from the lake the wooded mountains close in upon the river and trail (Badrock Canyon). To this point the valley continues wide and open, with a slight fall towards Flathead Lake, and the river for this distance is very similar to what it was when first seen. Here it was one hundred yards wide, two and a half feet deep, clear, pebbly bottom, banks sixty feet high. After first closing upon the river, the mountains again retire, and there is a further nearly level, though wooded, basin for some fourteen miles. At the upper end of the basin the river forks--one fork coming from the north (the North Fork of the Flathead) through a straight and promising valley, and one from the east. On this route is the trail leading to Marias Pass (up the Middle Fork). There is very likely a trail up the other. Beyond the fork the stream is walled in by high precipitous mountains, whose gray, naked peaks, in bold relief, rise from dark masses of fir and pine below them. The valley is narrow and always wooded; the trail is sometimes laborious and difficult, and grass for camping is always scarce, and so continues until the summit is passed. The divide of the Rocky Moun-

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tains at Marias Pass is seventy-eight miles from the head of Flathead Lake. In the last seventeen miles the valley rises rapidly; several small falls--one of about one hundred and forty feet rise--break the flow of the stream, gradually losing its tributaries and its volume; and besides the comparatively narrow ridge with which the valley abruptly terminates in the seventeen miles, the ascent is 2,170 feet; the divide at its lowest point is still 2,150 feet higher, and is 7,600 feet above the sea. A bare, rocky, circular ridge closes the valley, over which the trail crooks and winds, and is often just wide enough for the feet of the horse. It is wholly impracticable as a wagon pass. The passage of the summit was made on the 20th of October; the air was chilly and the snow flying. To this time we had enjoyed fine, clear autumnal weather; as we rose in the valley, getting frost, and finally ice, in the night. Dropping down some 2,000 feet into the valley on the eastern side of the divide, where heads one of the tributaries of Marias river (the Cut Bank), we passed those small lakes or ponds, clear and cold, on whose shaded borders the snowbanks of the previous winter were still resting. The contrasts in the growth of the trees on the west and east sides of the mountains are very noticeable. On the west the trees continue large and thrifty almost to the summit. On the east, what little growth there is consists of short, scrubby pines, only suitable for fuel. On one of the snow-bordered ponds we camped. Before the close of the day the snow was gathering on the ground, and continued falling until next day. When at a distance of only about a dozen miles from the summit we made the prairies, covered with some four inches of snow."

Later, Tinkham summarized the results of his trip as follows:

"The pass I find to be impracticable as a wagon route, and available for a railroad only with high grades, for about twenty-five miles, and with a tunnel of at least two miles in length, the mountain work being also generally rock cutting. The height of the pass is about 7,500 feet. The long approach to the summit led me to hope for a better result. Descending on the eastern slopes the next day after the passage, we attained the prairies soon after noon, while our time from Flathead Lake to the summit was about a week."

- - - - - - - - - - -

Museum Glacier - President Charles H. Clapp of the State University of Montana who has carried on extensive geological observations in the park for many years has suggested that so-called Clements Glacier (NATURE NOTES III, 74) be called Museum Glacier both because it is so easily accessible to the tourist and because it exhibits so remarkably many of the characteristics of a great glacier within such small compass. Two other glaciers straddle the Continental Divide in Glacier Park: the middle Carter Glacier on the east side of Carter Peak which discharges into the Valentine Creek-Waterton River-Hudson Bay system and into the Bowman Creek-North Fork-Pacific Ocean system; Two-Ocean Glacier on the east side of Vulture Peak which "has the distinction of being the only glacier in the park that discharges its waters above ground into both the Atlantic and the Pacific oceans." (M. R. Campbell, U.S.G.S. Bulletin 600, p.48).

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GLACIAL DRIFT

Many Glacier Mountain Sheep - I counted twenty-three sheep at the salt block at Many Glacier Hotel on October 8. - J. Ross Eakin

Busy Beaver - Beaver have built a strong dam across the creek in Two Medicine camp grounds. They have used the footbridge to support and strengthen it. Large beaver dams have been constructed all along Two Medicine Creek.
- Clyde C. Fauley, Park Ranger

A Chaser - Men working at the logging camp on Robinson's Place (North Fork Ranger District) were chased by a bull moose. "He shore wuz a big feller." - J. C. Nelson

The Deer Family - Deer are coming down and are seen more and more frequently along the roads and trails. Elk have left their summer range and are found in lower valleys. Moose are numerous on North Fork (Flathead) drainage. Trail Foreman Chubbic reported seeing a herd of seven in Dutch Creek Valley in late September. - Hugh W. Buchanan, Park Ranger

Abundant Grouse - According to reports of old timers, never in recent years have grouse been as abundant as this year. More than a score were flushed in the fourteen mile drive from Polebridge to Kintla Lake on October 12.

Tame Grouse - The fire lookout on Loneman Mountain had about thirty Franklin grouse callers every morning. They were breakfasted on bread crumbs and rolled barley. - C. G. Harkins, Park Ranger

Squawkers - The raucous squawking around Belton Headquarters is due to Steller jays and camp robbers, absent in summer, returning for winter.

Winter Visitants - Familiar winter birds now to be seen on Glacier's east side include magpies, redpolls and longspurs.

Intrepid Loon - Saturday morning, October 18, my three children were pulling their sleds up the power-plant hill to coast. Ruth, the youngest, was attacked by a juvenile loon, wounded and unable to fly, which must have dropped on the hill several days ago. Ruth's brothers, Jack and Bob, ran to her assistance, as well as a nearby carpenter. The intrepid bird would stand them all! It was caught and brot to Mr. Vincent and me for identification. It was taken to the river and released, and from its actions, when freed, it appeared very, very hungry. It was perhaps fortunate that Ruth came along and was judged dangerous; otherwise a weasel would surely have caught it, as one did my chickens, prospective frys, a short time ago. - Mrs. Ruth W. Vincent

Mourning Cloaks - 1930 has been a magnificent year for butterflies and moths in Glacier National Park. Never have tiger swallowtails, fritillaries, check-spots and sphinx-moths seemed more abundant. Last of this colorful band is the dark-colored mourning cloak which in the sunny days of early October still flitted about the landscape. This butterfly, like our bears and ground-squirrels, hibernates during the cold months of the year.

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NATURE NOTES FROM GLACIER NATIONAL PARK

NOVEMBER 1930

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UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
GLACIER NATIONAL PARK

NATURE NOTES FROM GLACIER NATIONAL PARK

Volume III November, 1930 Number 11

A monthly pamphlet edited by the Park Naturalist and distributed by the Educational Division of Glacier National Park to all interested in the Park and its natural history.

J. Ross Eakin, Park Superintendent Dr. G. C. Ruhle, Editor

"NATURE IS MORE THAN TRUTH; IT IS BEAUTY AS WELL."

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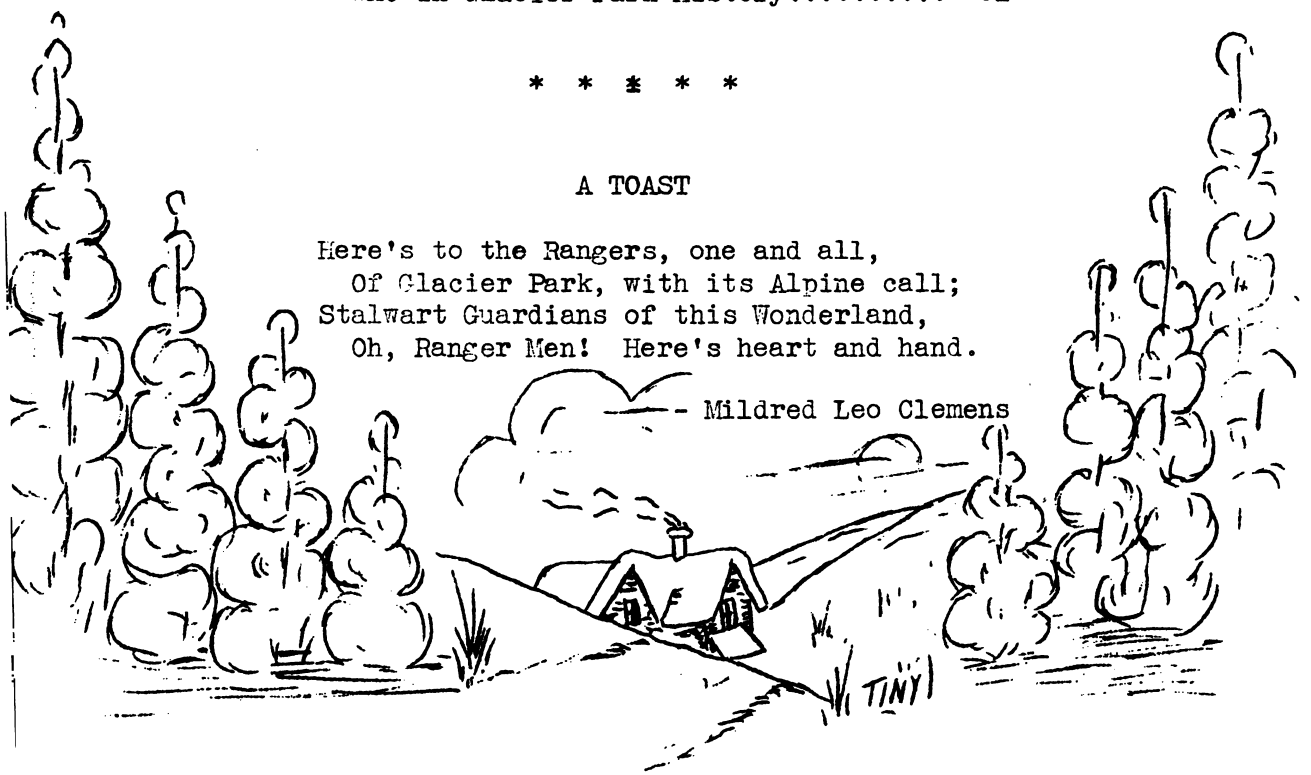
* * * * *

A TOAST

Here's to the Rangers, one and all,
Of Glacier Park, with its Alpine call;
Stalwart Guardians of this Wonderland,
Oh, Ranger Men! Here's heart and hand.

— Mildred Leo Clemens



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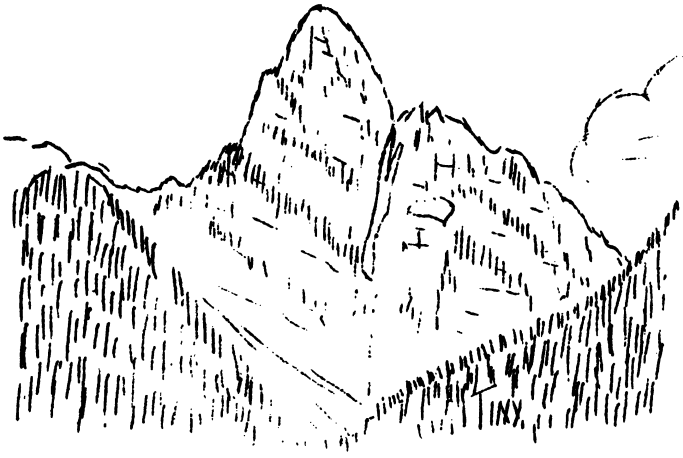
THE ASCENT OF ST. NICHOLAS

Dr. M. J. Elrod



Sinister and forbidding rises the jagged saw-tooth spire of St. Nicholas over the mountains in the southern lobe of Glacier National Park. Ever a challenge to all lovers of daring mountain climbing, it remained unsullied thru numerous attempts to gain its summit.

Reverend Conrad Wellen, Presbyterian minister of Havre, Montana, whose joy is the scaling of virgin mountain summits, had been told about St. Nicholas by Superintendent Eakin. He had made two trips to the peak and a number of attempts to climb it, always to be turned back by unsurmountable obstacles. A third trip was made in July, 1926 with a young man as companion. They followed up Park Creek from the Middle Fork of the Flathead to its tributary that flows between Statuary and Rampage Mountains. An old fire trail follows up this latter to the summit of the ridge. Going was good on this, tho the trail is a little difficult to find. Beyond the pass, there is no trail, but St. Nicholas is always in view, and they headed straight for it. Going thru brush and fallen timber, they camped the first night on a fork of Muir Creek, seven or eight hours of trudging from Walton. Another day was necessary to gain the headwaters of Muir Creek, a little lake near timberline. Their immediate destination was the ridge running out to the northeast from the peak. Scooped out of the great mass of rock is a little patch of an acre or so with grass, running water, firewood and shelter from the wind, a natural camping place in which the second night was spent.

On July 29, by 10:30 in the morning, the two had reached the great notch in the northeast facing nose of the mountain. Here was a little stone cairn marking the furthermost point of advance on previous attempts by Mr. Wellen; here the real problem began which was not to be diminished until the top was attained. At this place the companion remained while Wellen tried to find his way around a fifteen foot cliff which blocked passage. Twice he worked his way around to the northwest face, only to be balked and be forced to turn back. These two attempts consumed an hour of labor. Again he started on the same side, as it was impossible to proceed in any other way. Working his way upward a few feet at a time, he gradually gained the top of the wall, then crossed over the nose of the rock to the east face, at each movement marking his way with chalk so as to be able to return by the same route. It is hard enuff to get down such

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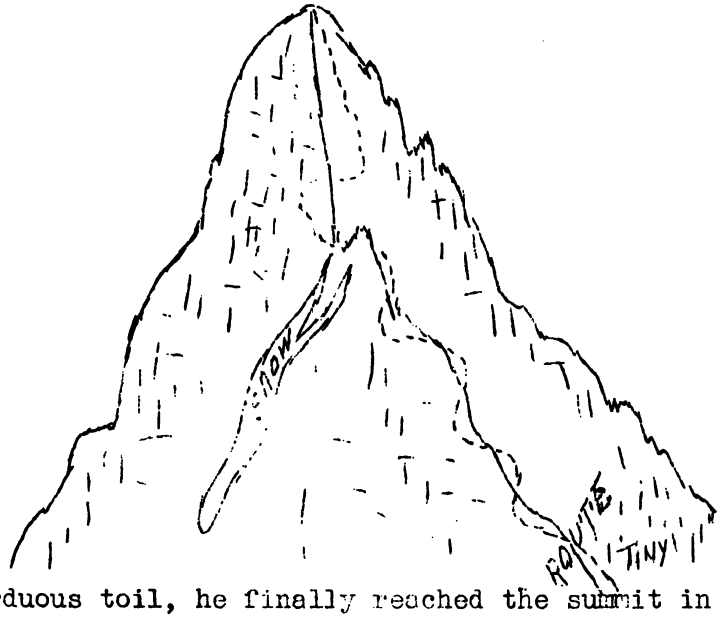

rocky walls without having to worry over picking one's way. By early afternoon he was nearly five hundred feet above the notch. A great gap in the ridge, made by the breaking away of a fifty or seventy-five foot piece of rock, and barely wide enuff for a man to wriggle thru, enabled him to cross to the opposite face of the mountain. Along a narrow ledge on this northwest face, the only one that Wellen knows of, he swung far out on that face, by which with much arduous toil, he finally reached the summit in mid-afternoon.

On top of St. Nicholas stands a little monument of stones, the cairn erected by Wellen on reaching the object of his desires. It is visible thru glasses from various places, the mute evidence of unflinching persistence in the face of most discouraging and appalling odds.

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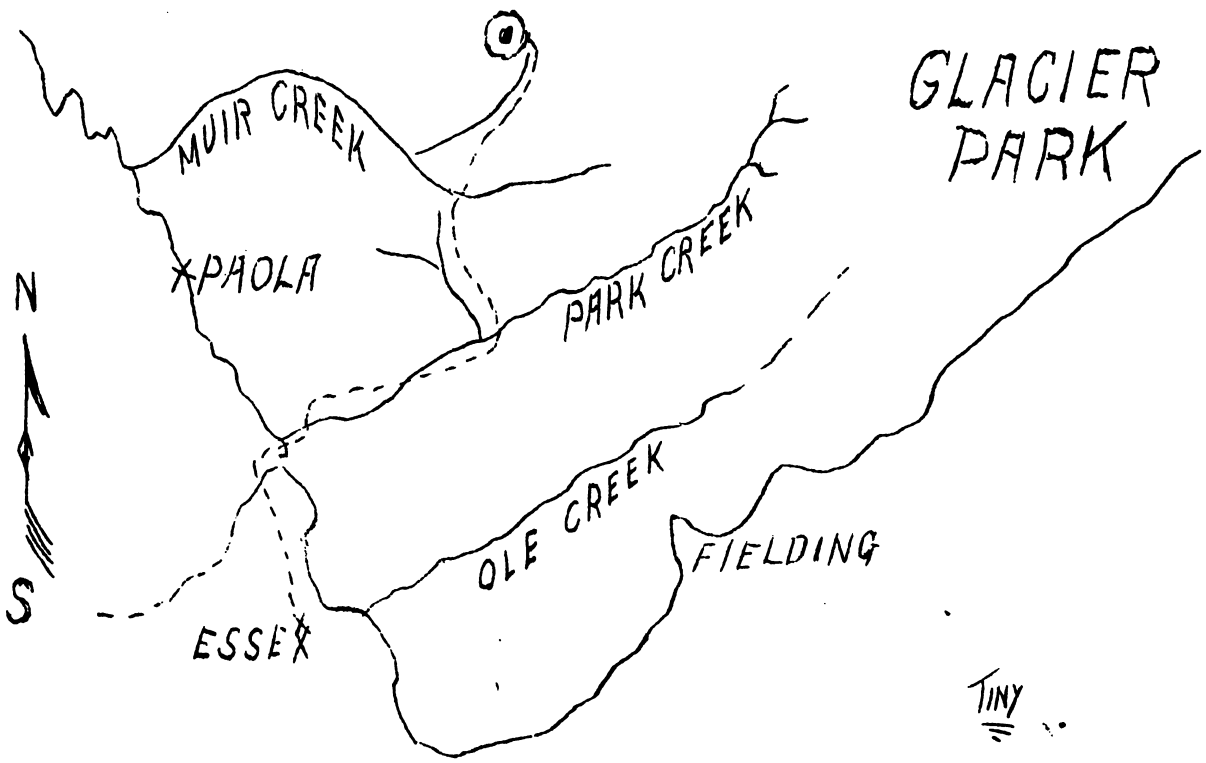

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LIFE FACTORS

G. C. Ruhle, Park Naturalist

Ornithologists have pointed out that the welfare of wild fowls - pheasants, grouse, quail - is closely linked with that of rabbits, since these latter are the principle food of all except the largest carnivorous birds and beasts. When rabbits are plentiful, all the wilderness thrives, smaller animals such as mice and shrews finding their natural enemies engaged in more profitable hunting, fur-bearers growing sleek and fat on an abundance of easily caught food, even trappers enjoying a wealth of return from their traps. However, rabbits suffer marked periodic diminutions of their numbers due to epidemics or other unexplained causes. Whenever such a decrease occurs, their natural enemies, to ward off starvation, must turn to other sources of food supply and to other more difficult, to be sure, methods of hunting. Competition grows keen; raptores wander far in search of food; their ranks, in turn, become depleted by the strenuous course of existence. But rabbits are remarkable for their proliferous nature, for their ability to increase more rapidly than any of the predators who naturally turn to them for food whenever possible. As the rabbits recuperate, the pendulum of the wilderness again swings from the depths to the heights of opulence.

Rabbits have never been very abundant in Glacier Park and its vicinity as abundance is measured in comparable sectors. This year, however, there appear to be a great many rabbits for this region. Reports of increased numbers follow closely the many reports of numerous grouse of various species. (See NATURE NOTES III, 84). Undoubtedly these two classes of reports are complementary. Still other reports indicate an unusual scarcity of the generally very numerous weasels, small, aggressive, murderous, probably the most destructive of all park carnivores to grouse, rabbits and smaller animals. Undoubtedly weasel scarcity contributes much to the possibility of increased numbers of grouse and rabbits. But most interesting is the unanswered question, what has become of the vanished weasels? Further observations may elucidate, but undoubtedly this, too, will remain one of the inexplicable incidents of the forest.

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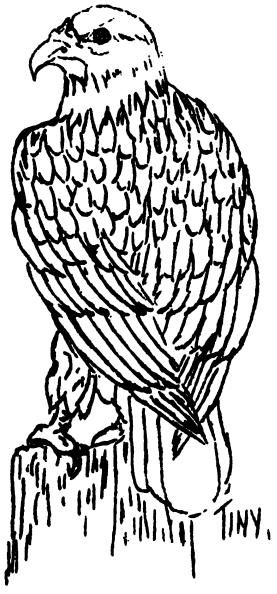
GLACIAL DRIFT



Prairie-haunting Eagles - Tho generally thot of as a bird of the high mountains, the golden eagle moves from rocky crags to open prairie when summer passes. Since it is always a rare, picturesque sight, I was fortunate in seeing not one but three on the bald prairie last month when I was carrying snow shoe rations to the cabin on Lee Creek. Two were flushed from the ground along the roadside, the third was perched upon a fence post. A light snow fall covered the ground; the temperature of the air was about twelve degrees above zero. These birds were probably attracted by the last awake Richardson ground squirrels whose tawny coloration is protective during the greater part of their stay above ground, but shows conspicuously against a background of snow. - F. L. Carter, Chief Ranger

Ancient Plant-life - Glacier's mountains are made up of Algonkian rocks (NATURE NOTES III, 79.) They are generally characterized by a scarcity of fossils, tho it is known that life existed during the period of their formation, in fact, the first life that left any distinct record, crustaceans, brachiopods, and primitive plants. Most abundant of Algonkian fossils in Glacier Park as elsewhere are representatives of a plant world of the lowest type that has left inorganic structures from which little of the original organism causing them can be learned. These appear as flattened concentric concretions of minute calcareous algae commonly known as Cryptozoon, coral-like colonies of plants that repeat themselves over and over. As would be expected, these secretions are most abundant in Siyeh limestone, blue-black, youngest and uppermost of the park's four principal formations. Most interesting are those that occur in the oldest and lowest, the faint blue Altyn limestone. A splendid fossil-bearing specimen of Altyn limestone was collected from Mt. Altyn, the type locality, by Dr. David White, chief topographer of the United States Geological Survey, when he visited the park in 1929. This specimen was recently shipped for permanent exhibit in the National Academy in Washington. - G.C.R.

Ornamental Trees and Deer - Water birches, quaking aspen, mountain maple and mountain ash were used in abundance in landscaping the grounds around Headquarters this fall, but deer apparently think they are more suitable for other purposes. Many a promising and hopeful group of saplings has been fatally injured by bucks rubbing the velvet from their antlers. Some of the trees have been saved by fencing. Of greater concern to the residents is the well-being of a graceful Douglas fir planted on the Fourth of July near the southwest corner of the administration building. It, like ten thousand other trees thruout the Nation, was planted as a memorial to the late Stephen T. Mather, first Director of the National Park Service, and arch-conservationist. Thus far it appears healthy and thrifty. - G.C.R.

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Two Medicine Bird-Notes - I picked up several evening grosbeaks overcome by the severe snowstorm of October 26. They soon revived to be released, no worse for the experience. The snowstorms of the last four days of October brot forth large flocks of crossbills and juncoes. I have seen several hundreds of crossbills in a single day. Magnificient pine grosbeaks are occasionally still seen (in late October), of all park birds, my favorite for color and markings. (See NATURE NOTES II, 37; III, 69.)

- C. C. Fouley, Park Ranger

Migration of Birds - Migration of ducks and geese reached its peak in early October. Robins and bluebirds, a few individuals, were still being reported by rangers as present within park territory on the first of November.

A Bear Sally - Bears, holed up for winter in early October sullied forth into the warm sunshine of the early days of November for a few more hours of activity in their life that is largely spent in the semi-comatose state of hibernation.

- Earl F. Dissmore
Assistant Chief Ranger

Elk Antlers - On a recent trip to the head of Nyack Valley I met a bull elk that had a very peculiarly shaped set of antlers. The right one was well formed, but the left curved out for six inches and divided into two prongs, one, a foot and a half long, bending back over the ear, the second running straight downward to his nostrils. - C. G. Harkins, Park Ranger

Nick's Lion Again - Last July Chief Ranger Forest L. ("Nick") Carter met a mountain lion on the trail from Waterton Lake. (NATURE NOTES III, 69.) It was pointed out that this was that to be the first that was ever seen or reported east of the Continental Divide. On October 31 I saw the trail of a lion in this same ranger district, which is mine. From the size, I judged him to be a little over half-grown. Altho "Nick" reported his as full-grown, it may be that the two lions are identical.

- L. O. Hansen, Park Ranger

Late Flowers - The western pasque flower on the east side (Pulsatilla ludoviciana) blooms early in the spring at low altitudes. A severely cold wave followed by mellow weather seems to have fooled some individual plants, for Ranger Andrew Fleutsch reports finding them in bloom at St. Marys on the thirtieth of October. - G.C.R.

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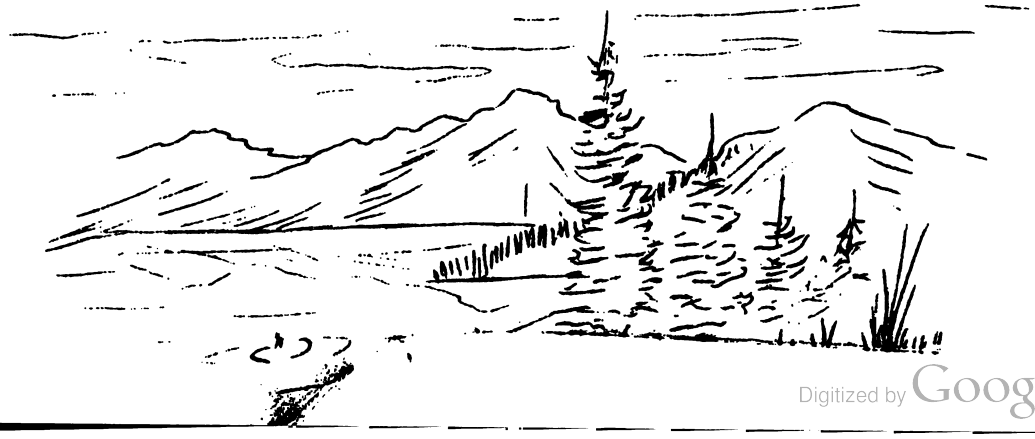
WHO'S WHO
In Glacier National Park History

5. THOMAS WRIGHT BLAKISTON (1832 - 1891), explorer and ornithologist, the second son of second baronet Sir Matthew Blakiston, was born on December 27, 1832 in Lymington, Hampshire. He was made a second lieutenant in the Royal Army in 1851 and served with his regiment in Ireland, Nova Scotia and the Crimea before Sebastopol. In 1857 he was appointed a member of the Scientific Expedition for Exploring British North America between Canada and the Rocky Mountains under the leadership of Captain John Palliser. He was chiefly employed for taking observations on magnetic conditions, temperature, and the like, which he published at Woolwich in 1859 under the title, "Report of the Exploration of Two Passes thru the Rocky Mountains." The passes were the North and South Kootenay Passes over which he had passed in 1858. In 1859, he was given command of a detachment of artillery at Canton, China, from which he organized the famous exploration party of the Middle and Upper Yangste-Kiang to Lhasa, the forbidden capital of Thibet. He produced a surprisingly accurate chart of the river from Hangkow to Pingshan. Resigning from the Commission in 1861, he founded sawmills at Hakodate, Japan, for the exportation of lumber into China, but his project was obstructed by the Japanese government. He then turned merchant, holding open house for all travellers, but especially those with scientific interests, so that he acquired the title, "le veritable roi d'Hakodate." Volume forty-two of the Journal of the Royal Geographic Society contains an interesting narrative on a journey thru Yezo. His collection of Asiatic birds is now the property of the museum at Hakodate.

In 1884, Blakiston visited Australia, New Zealand and England. He then settled in New Mexico, marrying on April 16, 1885, Anne Mary Dun of London, Ohio. He died in San Diego on October 15, 1891 and is buried at Columbus, Ohio.

Blakiston received the patrons' gold medal of the Royal Geographic Society in 1862. Besides the works mentioned above, he is author of "Five Months on the Yangste" (1862) and, with H. Pryor, "A Catalogue of Avifauna of Japan" (1884). Mt. Blakiston (9,600 feet) and Blakiston Brook in Waterton Lakes Park are named for him. He was the first to prepare a map of the region (1858), and is that to have named Waterton Lake after Charles Waterton (1782-1865), naturalist and author. (See NATURE NOTES II, 51 and 23).



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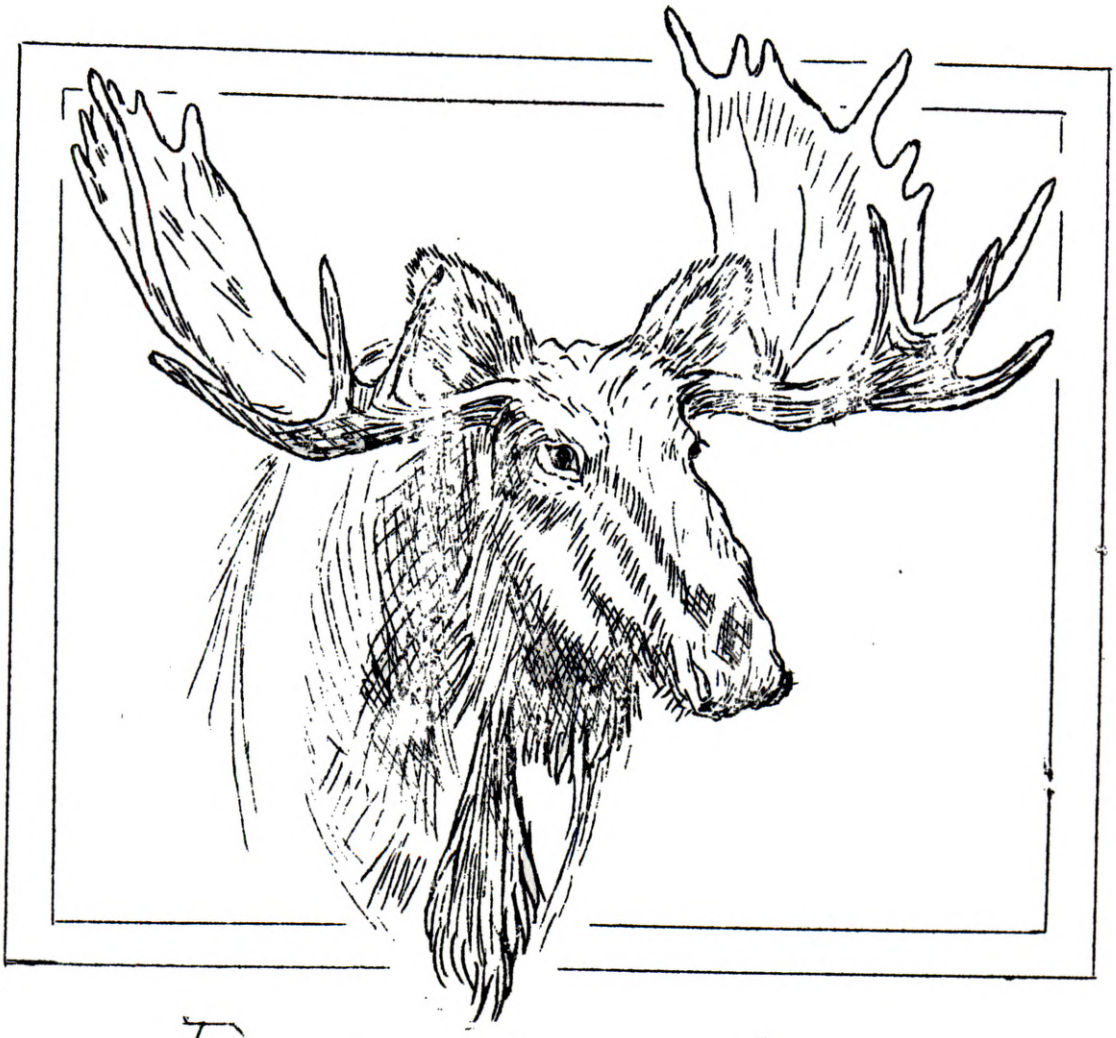

DECEMBER 1930

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HOLIDAY GREETINGS

Again it is the festive time of the year;
Again the winter stolstice has been passed;
The days begin slowly to lengthen:
We look forward to Nature's awakening,
A renewal of hopes, a promise of
better days in the New Year.
We of Glacier National Park
extend to all readers of NATURE NOTES
the hand of sincerity as we express
the wish that holiday happiness
be not fleeting, but extend
thruout the whole of 1931.

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THE WATER OUZEL

G. C. Ruhle, Park Naturalist

"Teach me half the gladness
That thy brain must know,
Such harmonious madness
From my lips would flow
The world should listen then
As I am listening now."
- Shelley, "To A Skylark."

On unkindly niveous days when the year is young, the traveler, moving with uncertain step up the precarious icy pavement that leads from Belton to Headquarters, may sometimes catch between the occasional gusts of wind sweeping up the canyon of the Middle Fork the faint rolling music, the exquisite delicate variations from the throat of a bird, with obbligato gurgling of brumal waters streaming down a gelid casement. Such mellow, prismatic medley of rolls and trills is scarcely to be associated with howling winds and falling snow - a scintilla of summer's twilight tranquillity breaking into the madness of winter - a tender strain from Heaven whispered ever so softly, almost inaudibly amidst the blustering reality of frigid existence. It is the water ouzel whose heart is ever attuned to gladness. There on the ice-covered banks of the hurrying current he sings and curtsies, as happy as Keats' nightingale or Shelley's skylark, but how strangely different. It is quite one thing to sing while skies are smiling and every one is singing; quite another to sing when all is hushed except the forces of winter and of storm.

Thruout winter, our rangers grimly and quietly push their weary steps thru snowy whiteness in forest and meadow. Nature is aphonous except for moaning of wind in tree tops, or companionate chattering of running water. On their lonely wanderings, none so unfailingly cheers them as this Israfel of the beaten spray, who knows no note of sadness, who pours forth his soul in rapturous cadences in snow-storm or in boisterous wind. What tho the whole world be frozen: no need of warmth or sunshine for his ecstacy; no requisite of vernal enchantment to conjure forth the arabesque of his tinkling song. Such harmonious madness, such nepenthe, dissolves weariness drudgery and solitude; the fatigued guardian of the Wild is refreshed by the ethereal sweetness of his music.

The call-note of the ouzel is not musical; it is a metallic rattling that is usually uttered when the bird takes to flight. The song, clear and silvery, consists of rich full-notes, delicately embellished in rococo style with trills that fade in mellifluent cadences until over-swelled by the music of the stream or the melody of the waterfall. Here and there is a baroque interspersion of harsher call-notes. Thus varied and elaborate, accompanied and refined by the gurgle of marginal eddies, the low whisper of quiet reaches, the singing of rapid and cascade,

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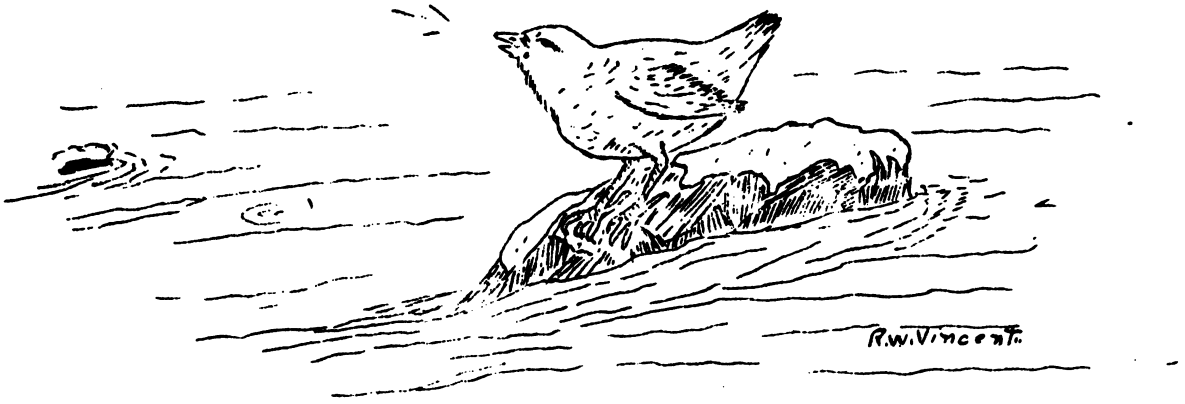
the lay of winds among the tree-tops, the song has a distinctive quality that is enhanced and glorified by the impressiveness of its accompaniment and surroundings.

In canyons spanned by rainbows, in cascades fringed with spray, along banks embossed with snow, on rocks capped crystal blue with ice, this singularly winsome and exhilarating chap, with spirit as sparkling as the dashing waters among which he lives, pours forth his exquisite tunefulness, which blesses its maker with happiness and an idolizing auditor with aesthetic appeal by the concord of sweet sound.



Hungarian Partridges - From Europe and West Central Asia there was introduced into Northern North America a splendid member of the grouse family known as the Hungarian Partridge. Lying well to dogs and starting with the same great burst of speed when flushed, this fine game-bird is of the same type as that favorite of American sportsmen, the bob-white. The Hungarian Partridge is larger, hardier than the native American, so is not so easily killed off by severe winters. For the past quarter-century, it has been sporadically distributed from time to time thruout the Northern States and Southern Canada. It is reputed to be establishing itself in Flathead Valley, and one or more reports have been circulated that it has also been seen along the North Fork of the Flathead in Glacier Park. In November, Ranger Earl F. Dissmore reported seeing a flock of fifteen in the cultivated sector of Lake McDonald Hotel. Their fine vermiculation was distinctive, and a large amount of rufous brown in the tail was flashed as they whirred off in sudden flight.

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LITTLE BIG-GAME HUNTER

Chas. L. Croghan, Park Ranger

It was down on a cold stormy morning. He circled the cabin in diligent search for possible entrance. At a promising place, he busily engaged himself in removing some of the chinking between the logs. His was eagerness to reach the warm shelter and bountiful supply of foodstuffs such as ranger cabins must afford during the middle of winter. His scratching brot the district ranger to the door to discover the cause of disturbance so early in the morning. The stranger glanced quickly at the woodsman's face, earnest, storm-carved; then examined more carefully the shoes with particular interest in their size and hardness. Satisfied that here was small cause for alarm, he entered and began a meticulous inspection of everything in and out of sight, in the cupboard, behind the stove, upon the table, under the bed, and lastly thru a most fascinating set of open drawers and pigeon-holes in an old secretary's desk. The ranger watched agape at the infringement of his right of privacy-of-home, at such unwarranted examination of his property. It was some minutes before he was restored to his normal complacent presence of mind. Perhaps this early caller was hungry. To be sure, hospitality demanded that he share breakfast with his guest, tho uninvited and unexpected. Bread, potatoes, sugar, even pie were disdainfully scorned in order. Lastly bacon was offered. The light in the stranger's eye brightened, he became interested, bounced over to sieze the delicacy eagerly. Out of the door into the darkness scurried delicacy and caller, the former to be cached for more convenient consumption, the latter to return immediately for a more thoro-going search than before. The offer of a second rasher of bacon was grasped like the first, was followed by similar disposal. As the snake-like body of Ermine waved over the snow into the darkness, the ranger impolitely but firmly barred the door against further nosey visitation.

The ermine or weasel is the smallest member of the marten family and most remarkable in that the color of its pelage changes completely twice a year. In summer, it is a warm brown; in winter, a pure white except for the jet black tip of a tail. Mice constitute the principle article of diet, tho the little beast will courageously attack and kill birds and animals several times as large as itself. It has little fear of man, and will raise much havoc in a poultry yard, once the taste for domestic fowl is acquired. At times, eight or ten chickens will be killed by a single individual to satiate a lust for blood and the kill. Most noteworthy is the persistence with which it pursues an unfortunate rabbit, a persistence that puts the efforts of human big-game hunters to shame. Once upon the trail, the weasel mercilessly, inflexibly follows thru thickets and fences, in and out of the mazes of stubble or loose rocks; doggedly, steadily it keeps on in its pursuit for hours and hours until the quarry is discovered and overtaken in the unguarded moment. With the savageness of a tiger, it pounces as it aims for the joint at the base of the head or at the jugular vein. Once getting its hold, it clings ferret-like until the last struggle of the victim is over.

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EDITORIAL PAGE

A CHRISTMAS EDITORIAL

On Christmas Day at Christian hearthsides thruout the Nation is celebrated the birthday of the "King of Kings." Whether or not we be Christians, whether or not we believe in the truth of the Gospel Story, whether or not we accept the teachings of the Nazarene as the rule and guide of our conduct - Christian or non-Christian, who can deviate widely from the essence of His teachings? We find the life of Christ streaming with ineffable fragrance that impregnates and enriches all with the excellency of its perfume. It is only natural that the literary critic or other serious analyst ask how it came to be that He spoke such words of charm. What must have been the background to cause him to speak as He did, in manner and in content? From whence came the grace of His demeanor? The World, like Iago, must well confess that His was a daily beauty that makes it seem most ugly.

One of the most singular characteristics of Jesus' literary style is His keen instinct for fact. This trait must have been derived from or have been complement to the strong devotion to Nature which He manifestly possessed. How graphic are His pictures; how extremely true to life the actors, both human and dumb, that fill his stories, his paragraphs and his phrases: the twittering sparrows, the mustard seed of latent greatness, the wind that blows wherever it lists, the sunsets burning red at close of day. His is an eagle with an eagle's instinct for carrion; His are moths that corrupt the garments of the owner; His is corn that grows as He uses it in illustration. Jesus does not employ abstractions: these are not necessary for one whose senses have been attuned with love of the birds, beasts and flowers about Him, one whose eye has grown keen with continued close observation of Nature. And how He must love those happy, living creatures which swarm in parable and metaphor.

His speech, so blithe and sparkling, is winsome, too, because it is packed with tenderness and comprehension, with evident sympathy for even the lowliest. He recalls the special Providence that remembers even the fall of the individual sparrow. His God clothes the grass of the field that tomorrow is cast into the oven. He it is who teaches us to look for Deity in the commonplace and the ubiquitous, who places God within our reach and understanding everywhere, who elucidates and makes manifest His Omnipresence. His were illustrations that can be totalled in the few well-chosen words of Robert Browning: "No mere mote's breadth but teems immense, with witnessings of Providence."

His was not a bookish education; rather, His was the innate knowledge gleaned from close association and intimate companionship with Nature and her secrets. His were seeing eyes that perceived keenly, clearly; His were hearing ears that took in all about Him.

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Do you feel that it is not meet that an editorial, a private opinion, appearing in such a publication as NATURE NOTES, smack of religious flavor? Do you object to the use of His life as an example of a parallelism between Great Thot and the aforementioned daily beauty on the one hand, and a love for Nature and her handiwork on the other. Need we for ~~lack~~ of material go to His life at all for such a parallelism? One might just as easily turn to Jeremiah, to Wordsworth, to Beethoven or any of a thousand other Greats, and find precisely the same. But to me, perhaps "with prejudice," as you say, the supreme example is to be found in Him, the lowly Carpenter of Nazareth, whose influence, whether we like it or not, has marked deeply the destiny of the World.

Christmas Day, 1930

* * * * * *

GLACIAL DRIFT

An Elk-killing - Within an hour's travel from my (Paola) ranger station, I saw a lone elk calf on the trail in the latter part of November. A week later, I found the carcass of a cow, half-eaten by coyotes. Evidence points to a direct kill by these predators. Never before have I heard of the killing of a full-grown elk by coyotes.
- Roy E. Newbury, Park Ranger

Waterton Grosbeaks - The flock of pine grosbeaks that have hovered around the station all summer (NATURE NOTES III, 69) disappeared when the big storm came on the twelfth of November. Four stragglers lingered until the twenty-second. - L. O. Hansen, Park Ranger

Closed for the Season - Trails on the east side were closed by snow on November twelfth. Automotive equipment marooned at Many Glacier and St. Marys had to be towed to Glacier Park via Duck Lake and Browning with the aid of a caterpillar tractor. Later, the Blackfeet Highway over Hudson Bay Divide was broken open, and travel to the Canadian line was still possible in the middle of December.

Nature Notes News - How far does news originating in NATURE NOTES travel? The park naturalist was surprised to find the article on Hibernating Mosquitoes (Volume III, 68) included in a column, "Odd Bits of Science," that appeared in the November Eighth issue of the Hotel Pennsylvania Daily (New York City).

Index to Volumes II and III - Subject, Author and General Indexes have been prepared for both 1929 and 1930 volumes of NATURE NOTES. Copies are available to anyone desiring them.

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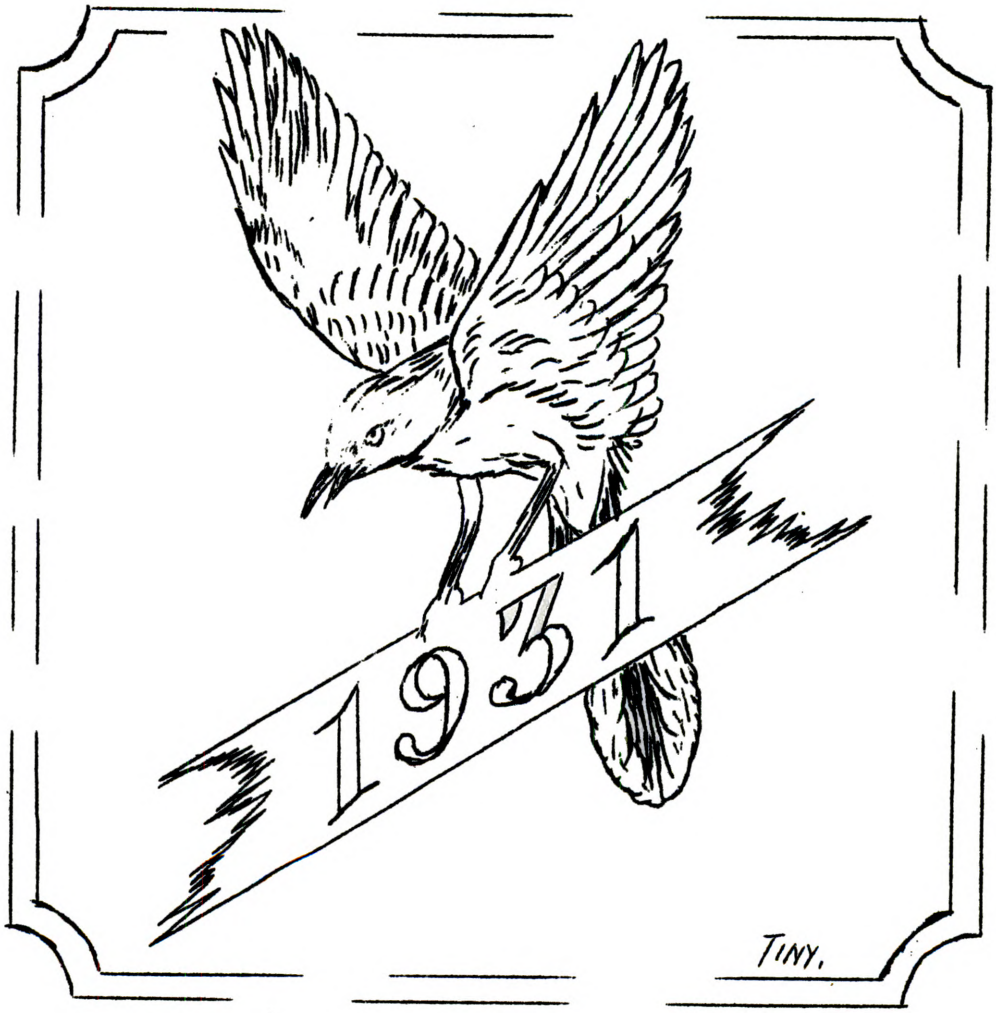
GLACIAL DRIFT

NOTES FROM

GLACIER NATIONAL PARK



JANUARY 1931

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UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
GLACIER NATIONAL PARK

GLACIAL DRIFT

Volume IV January, 1931 Number 1

A monthly pamphlet edited by the Park Naturalist and distributed by the Educational Division of Glacier National Park to all interested in the Park and its natural history.

Eivind T. Scoyen, Park Superintendent Dr. G. C. Ruhle, Editor

"STUDY NATURE, NOT BOOKS." (Agassiz)

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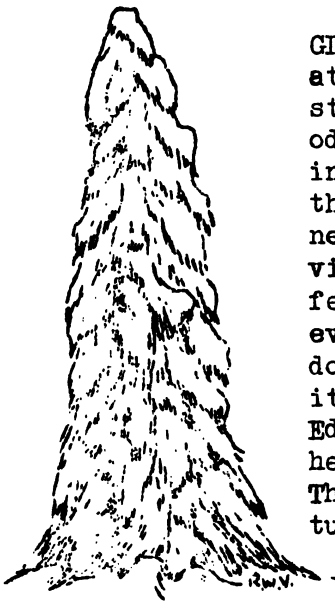
OUR NEW NAME



With this issue, the name, "NATURE NOTES FROM GLACIER NATIONAL PARK" will be discontinued, tentatively at least. Altho this type of publication was originally started for the purpose of preserving and broadcasting odd bits of news from the world of natural history within the park, its horizon has widened so extensively that the original appellation has become a misnomer. The new name is taken from the most popular section of previous issues. Drift constitutes one of the most lasting features of glacial action, is one of the most enduring evidences of glaciation long past. As a glacier moves down its course, picking up whatever it can to use in its work and purveying it as far as possible, so the Educational Department gleans bits here and there to help in its work and broadcasts them as far as possible. These bits are tools of ours; collectively they constitute our GLACIAL DRIFT.

Publications using articles appearing in GLACIAL DRIFT please credit the same to the author and to GLACIAL DRIFT, GLACIER NATIONAL PARK.

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AN ASCENT OF MT. CLEVELAND

Norman Clyde

Mt. Cleveland, the highest peak in Glacier Park, 10,438 feet in elevation, is a remarkably imposing mountain. Its rugged outline and huge mass deeply carved by great cirques render it conspicuous far up and down the range. It stands out with striking boldness when seen across the basin of Flattop Mountain and from the Livingston Range to the west. It forms the center of a magnificent group of mountains as seen from a score of peaks to the south and is the most prominent feature of the array of mountains about the head of Waterton Lake, when viewed from the north. When nearby, its huge cirques and lofty precipices impress the beholder with awe. It is usually ascended from the west and if a good route is chosen, affords no especial difficulties of a mountaineering character. However, the occurrence of heavy timber on its lower slopes, through which there is only a vestige of a trail and the six thousand feet of vertical rise from the base to the summit demands a considerable amount of endurance on the part of those who undertake to climb it, but there is ample reward in the marvelous view obtainable from it - one seldom surpassed in scope and magnificence.

During a previous summer, while camped with the Sierra Club of California at the upper end of Waterton Lake, the writer and two companions set out to make an ascent. After following a trail southward for several miles we turned at right angles westward and began to make our way upward through the dense belt of fir, where fallen timber, a heavy growth of underbrush, twisted and prone alder thickets impeded our progress considerably, but when the six thousand foot level was passed, the tall forest gradually gave way to groves of diminutive arctic fir and spruce, together with extensive meadows of alpine flowers. The castilleia, the aster, the galliardia and many others grew in great profusion and possessed a freshness and beauty of coloring that were a delight to behold. Above these wild flower gardens were loose scree-slopes composed of disintegrating fragments of lime stone and argillite. To the left was a great precipice and ahead were lofty pinnacles. The latter were avoided by passing to the right of them along the shelves at their base, after which a scramble of a thousand feet over shelves of shale and slate and a strip of igneous rock brought us to the broad, gently sloping summit.

The atmosphere was clear and the view amazing. It included not only the mountains of Glacier Park in almost its entire length and breadth but the plains east and northeast for an immense distance, other ranges to the south and west, and the Canadian Rockies, whose higher summits stood imposingly grouped on the distant northern horizon. Near at hand one was astounded at the amazing diversity of beautiful and sublime scenery abounding in precipices, enormous cirques, gently curved valleys, picturesque, sapphire and turquoise lakes, dense, dark green forests, grass-covered slopes, white, crevasse-cleft glaciers and scores of variously and strikingly-carved mountain peaks. Despite the prevailing ruggedness of form and line, a softness of tone pervaded the entire panorama. The verdant expanses of forest and meadow, the blue and green tints of the quiet lakes, the subdued shades

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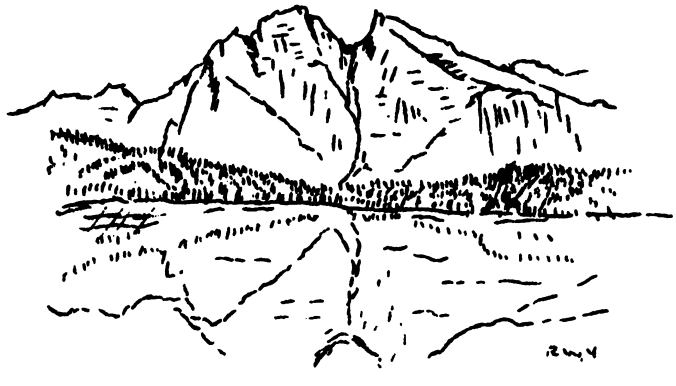
of gray and buff, maroon and brown relieved the sharply defined contours of the precipitous mountains with their exquisite mildness and charm of coloring. A short distance north and east from the highest point one looks down into huge adjoining cirques having great bowl-like walls almost a mile in height. A sky of lovely azure over-arched the landscape in all its beauty and grandeur.

Camp that night was to be south of Mt. Cleveland near Indian Pass and we therefore hesitated to descend the eastern slope to the base and reascend several thousand feet to the pass. On the other hand, unforeseen obstacles might be encountered if another route were chosen. After a short deliberation we decided to follow the ridge southward toward the pass.

As the descent was begun, the mountains basked in the light of a northern sunny summer afternoon with a brightness that was accentuated by the shadows that were gradually advancing eastward from the summits. Occasionally we stopped to gaze down over great precipices or to observe the wild goats that were descending from the ledges to browse on the slopes and meadows below. We quickly reached a saddle to the south of the summit and then followed a horizontal course along shelves to the west of a line of sharp pinnacles. Although it looked somewhat difficult and hazardous from a distance, it proved to be one of comparative ease and safety. The view along the chain of great peaks was superb. In the foreground was the deep, forested valley of the Middle Fork of the Belly River, with a chain of fine lakes, and beyond it, the beautiful and imposing form of Mt. Merritt sweeping grandly upward from the valley and surmounted by striking cliffs and pinnacles towering over four thousand feet above the lakes. Far beyond it the line of rugged peaks receded to the southern horizon. The air was ideally clear and the mountains seemed to delight in the purity and brightness of the light with which they were flooded.

As we proceeded along the shelves, a female goat and her two kids were approached to within a few rods as they stood gazing inquisitively at us. After going along the narrow benches about two miles we crossed through a notch to the west side of the line of sharp peaks, dropped down a chimney for several hundred feet and then continued along the ledges to Indian Pass. From there a descent of a few minutes down a grassy slope and spruce thickets brought us to the camp located by a small lake and surrounded by the tapering, picturesque peaks for which this vicinity is noted.



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TILL

Till - Material carried by a glacier and dumped in heterogeneous fashion as the ice melts is called Till. It is one of the two forms of glacial drift, the other, sorted out and stratified by the water from the melting ice is called glacio-fluvial deposit. Our new section, Till, successor to the section "Glacier Drift" of NATURE NOTES, contains heterogeneous bits of news and comments in unassorted assemblage.

Emergency! Your Tolerance, Please! - It would seem that a publication such as GLACIAL DRIFT would certainly be unaffected by Hard Times, but not so. Order has come from the Washington Office that all departments make special efforts for economy. To conserve stationery this pamphlet will hereafter be mimeographed on both sides of the paper. Because of a shortage of office help, the next four numbers will in all probability be released in two issues. Please bear with us in these trying times.

About Birds -"Evening and pine grosbeaks are still to be sean in alder thickets at Two Medicine."-Clyde C. Fauley, Park Ranger, January 1, 1931.

"A belated flock of twelve geese came in and passed the night here (at Waterton Lake) on December 24." - L.O. Hanson, Park Ranger.

"On my eastside snowshoe patrol (twelve days in December, one hundred seventy five miles long), I actually counted eighty-seven grouse. I saw tracks of many others. -Thos. E. Whitcraft, Ass't Chief Ranger.

"I saw ten sharp-tailed grouse at the end of the Transmountain Highway near Sun Camp." -Andrew E. Fluetsch, Park Ranger.

"I saw four ptarmigan at the foot of Sherburne Peak on December 14." -Ben C. Miller, Park Ranger.

Permanent Residents - Ornithologists often classify the avifauna of a region with respect to the time that the individuals are to be found there. Birds are either summer residents, winter visitants, transients or permanent residents. Many a bird recorded as a summer resident is properly classed as a permanent resident this year owing to the mildness of the winter. A flicker called lustily outside my window on January 10. Robins enjoying unseasonal warmth have not been a great rarity. Even bluebirds may be seen in Flathead Valley.

Missing Callers - When a snowshoe-weary ranger drags into a cabin and the smoke curls blue from the chimney, it is only a matter of a few moments until raucous, beggarly camp-robbers, bluejays and nutcrackers are gathering outside. This is not so this year. Spending two nights at Logan Creek Snowshoe cabin, I counted only one camp-robber and two jays, and these seemed strangely quiet as they moved about in the forest trees.

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On My Snowshoe Patrol.- Of eastside ranger districts, Waterton leads in abundance of small fur-bearers, mostly marten and beavers, tho there are some mink and a few weasels. Beaver are increasing in Belly River District. A large colony lives in Glenn's Lake; another is to be seen at the head of Crossley Lake. Three fresh cutting grounds have been started at Belly River between the ranger station and the line. Many marten, several coyote and a few weasel tracks were seen on the patrol between Lee Creek and Sherburne Lake. A large beaver colony is located on Swiftcurrent Creek above Wilbur Creek, and a small colony on Stump Lake. There is no sign of beaver on Sherburne Lake. Beaver are present near the head of St. Mary Lake. Marten tracks were seen near Red Eagle snowshoe cabin, and a few weasel and coyote tracks between St. Mary and Cutbank. A beaver colony is located two miles above Cutbank Chalet on the North Fork. Otter tracks also were seen here. Beaver are increasing at Two Medicine. Lynx and weasel tracks were observed on Midvale Creek. Everywhere was an abundance of cottontail and snowshoe rabbit tracks.

-Thos. E. Whitcraft, Assistant Chief Ranger.

Beaver Construction.- New houses have appeared in the beaver ponds on the south shore of Middle Two Medicine Lake. Next summer park guests will have ample opportunity of seeing beaver constructions within easy walking distance from the chalet or camp ground. -Clyde C. Fauley, Park Ranger.

The Rangers Say.- Ranger Elmer Ness reported lynx tracks on both sides of his Cutbank Valley.

"One mountain lion appears to be hanging around the lower end of Logging Lake." -Chas. L. Croghan.

"A bear in the North Fork Ranger District had shed its antlers by December 18th." -Channing T. Howell.

Christmas Offering.- Twenty five deer had been feeding daily at Lake McDonald ranger station feedyard. Realizing something special should be on deck Christmas morning, twenty new ones appeared. Ranger Hugh Buchanan responded with a generous helping of hay.

Error.- Credit belongs to Acting Assistant Chief Ranger Dissmore for calling the park naturalist's attention to his error in reporting the killing of ornamental trees about Headquarters. (NATURE NOTES, III, 89). Deer shed their velvet in August. Most of the dead trees were killed in September or October by deer who relished the bark for food.

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A Quill's Piercing Quality - An incident with a porcupine occurred just recently here in the Two Medicine District and is related for the benefit of those who doubt the effectiveness of the porcupine's quill-piercing qualities. I was returning from town after dark in my car and while coming around a curve I barely missed a porcupine. The rear wheel must have come very close to him, but I gave it no more thought until the warehouse clerk at Glacier Park called my attention to one of the tires on the rear wheels. It had many porcupine quills sticking in it a la pin cushion. This was several days later and they had clung there in spite of driving through snow and mud. Anyone who tries to pierce the live rubber walls of a balloon tire can get an idea of the sharpness required and the force with which a porcupine drives its quills with a slap of its tail.

- Clyde C. Fauley, Park Ranger

Fall Fishing - As long as the waters of lakes are free from ice, fishing boats may be seen on their surfaces. The fishermen are after their catch of flat trout, tempting enuff at this time of year. During the fall run, whitefish too are sought after. As these latter are not game fish, they may be netted as they attempt to go upstream to spawn.

Meteorological - Glacier, like the rest of the country, has been enjoying unseasonably warm weather. The lowest temperature reported on the east side in December was seven above at Two Medicine on the twenty-sixth. It was six below at Kishenehn on the same day. Belly River reported the almost incredible high of 74 for the month.

Little Snow - Glacier is experiencing one of the lightest winters on record. The park naturalist measured twenty-five inches of snow at the switchback on the Transmountain Highway, thirty inches on the level at Camp Nine, three miles further. It is still possible to drive to the head of Lake McDonald on the west side, to Many Glacier and Canada from Glacier Park on the east side.

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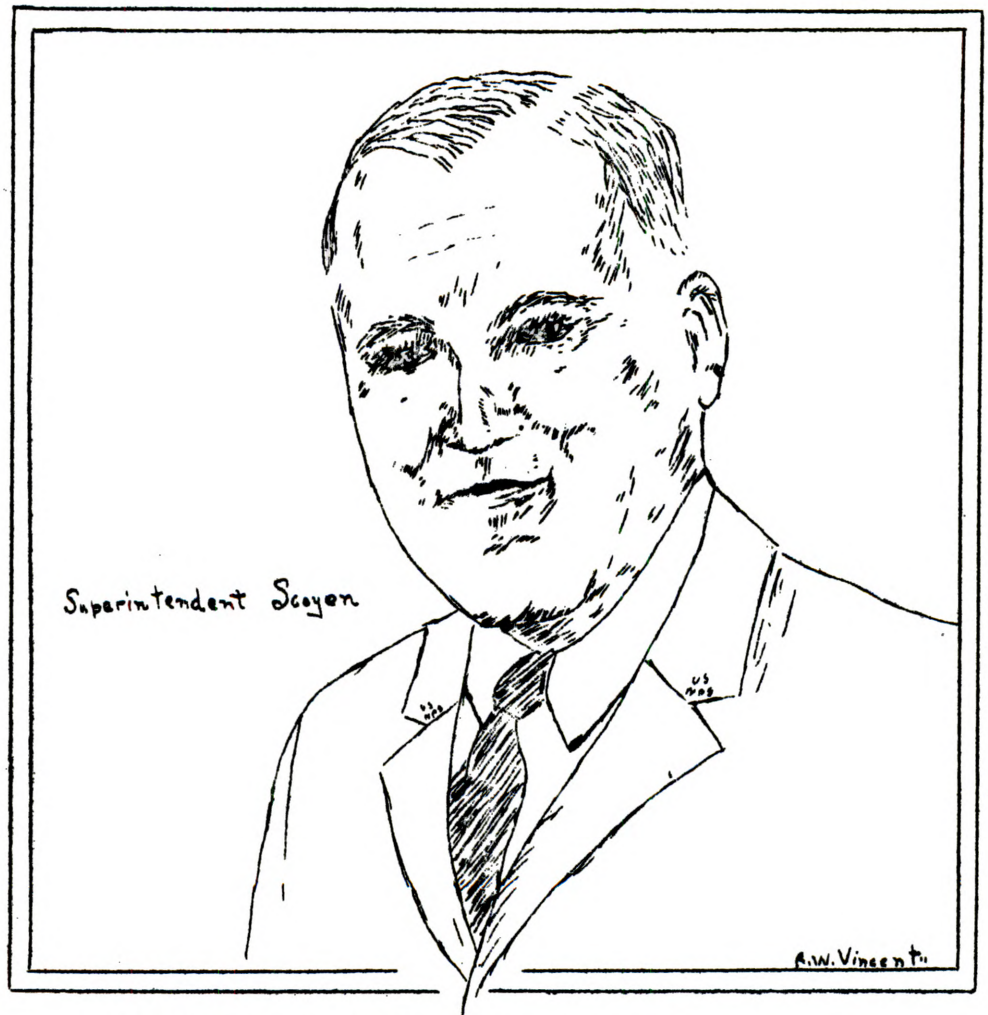
GLACIAL DRIFT

NOTES FROM GLACIER NATIONAL PARK



FEBRUARY - MARCH 1931

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UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
GLACIER NATIONAL PARK

GLACIAL DRIFT

Volume IV February-March, 1931 Numbers 2 and 3

A monthly pamphlet edited by the Park Naturalist and distributed by the Educational Division of Glacier National Park to all interested in the Park and its natural history.

Eivind T. Scoyen, Park Superintendent Dr. G. C. Ruhle, Editor

"STUDY NATURE, NOT BOOKS." (Agassiz)

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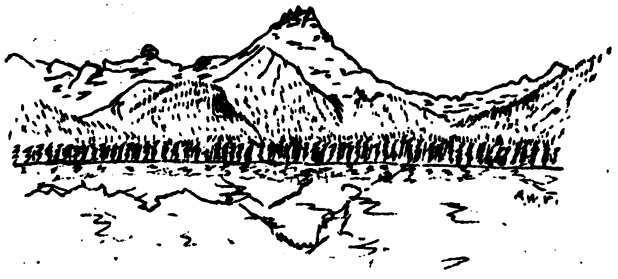
Indexes; Back Numbers - Indexes to back volumes will not be available for distribution until the latter part of the month. Available to those who first write for them is a limited supply of the following back issues: Volume II, the June and September numbers; Volume III, the April, May, July, August, September, October, November and December numbers.



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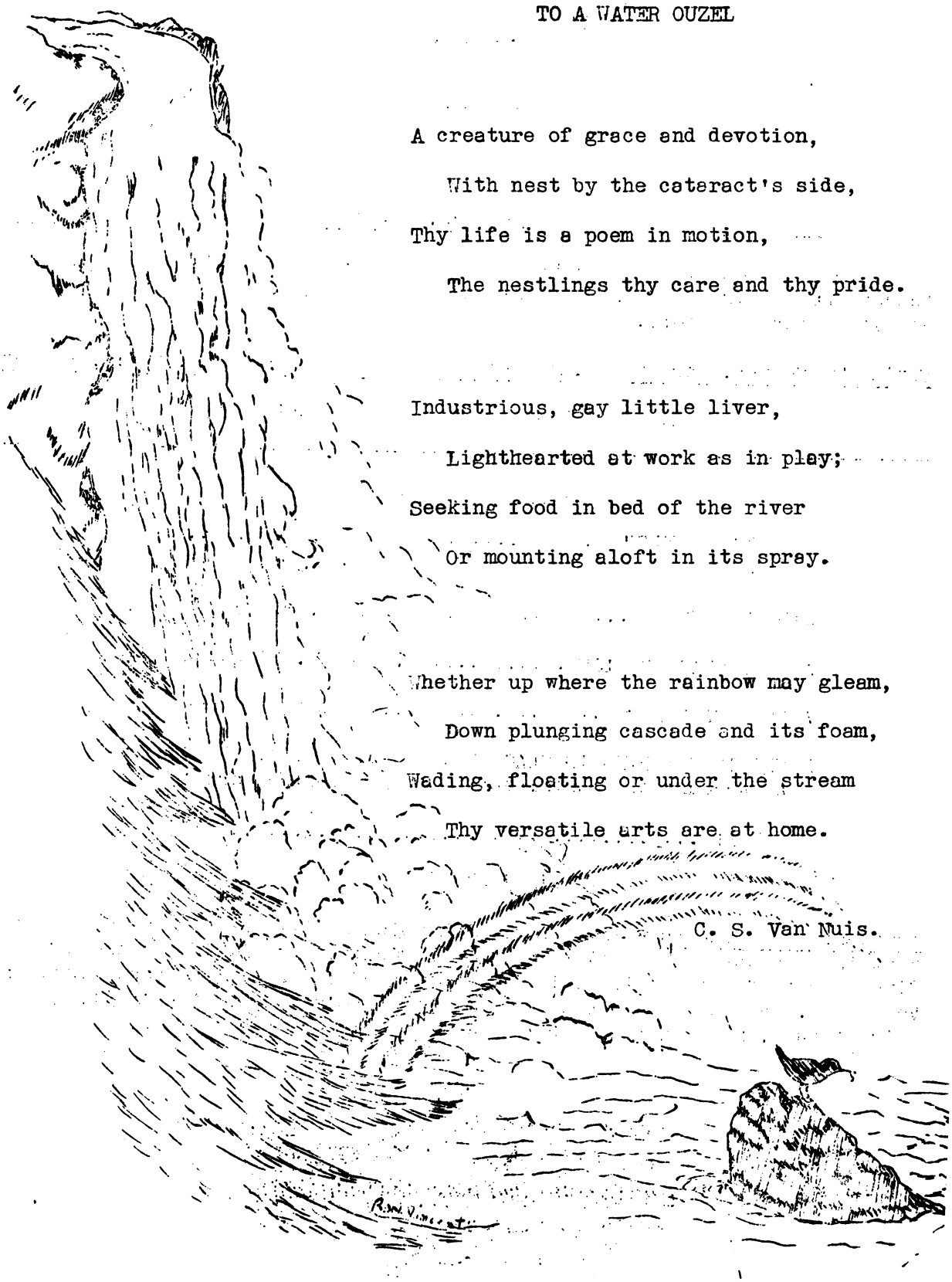

TO A WATER OUZEL

A creature of grace and devotion,
With nest by the cataract's side,
Thy life is a poem in motion,
The nestlings thy care and thy pride.

Industrious, gay little liver,
Lighthearted at work as in play;
Seeking food in bed of the river
Or mounting aloft in its spray.

Whether up where the rainbow may gleam,
Down plunging cascade and its foam,
Wading, floating or under the stream
Thy versatile arts are at home.

C. S. Van Nuis.

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WINTER FEEDING

E. T. Scoyen, Park Superintendent

Rangers report that over five hundred deer (actual count) come to the various feed grounds for hay. Moreover, it is interesting to note that all of these are whitetail. Tho a blacktail, or mule deer, has been known to walk across the feeding ground to take a lick at the salt block, it distains to accept any dole in the form of food, and after obtaining the desired ration of salt, promptly goes back into the woods to find the grub that Nature has provided. Deer are very tame around Park Headquarters where several will feed from the hand. Practically all residents put out scraps of lettuce, bread, cake, and potato peelings for these back-door beggars*. Again the species is whitetail, and Mr. Mule Deer refuses even to consider a beggar's life.

This is very interesting to me, for I can remember that the situation was completely reversed when I was a boy in Yellowstone. The aristocrat was Mr. Whitetail who considered it below his dignity to accept doles or to give the slightest impression that gifts thrown from the back door might be acceptable. His brothers of the other species were always to be found on the feed ground, and, as beggars, were possessed of a colossal amount of nerve; in fact, it could be stated that their actions were frequently impudent. Even in later years when the whitetail became more friendly, they were always more timid than the other species.

Why these differences?

* Also front door - and a few individuals will even follow into the house, if allowed.

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A MANY GLACIER LION

G. M. Kilbourn

Having been walking guide for the Park Saddle Horse Company at Many Glacier for three years (1927-1929), I was more than casually interested in the recent occurence of a mountain lion east of the Continental Divide (NATURE NOTES III. 69). It reminded me of one of the strangest experiences I had in the park. I was looking for goats near Iceberg Lake during my first full summer in the park (1927) when some kind of a big cat jumped right into the range of my glasses!

Planning to climb Pinnacle Wall that day and try for some goat snapshots, I left the trail half a mile east of the lake and began searching the snowdrifts at the base of the final cliffs. These drifts, strung like a necklace along the top of the rock slides, had seemed to be a favorite strolling place for the goats on their early morning meanders. But on this particular morning there wasn't a goat visible to the naked eye, and my glasses seemed to be doing no better, when suddenly a great lump of darkness bounced down from the cliff to the middle of the drift that I happened to be scanning. For a moment it lay still and shapeless, and I thought it only a boulder. But then, just as suddenly as it had arrived, it turned sideways, spraddled legs and head and the arching back of a huge cat, sprang to the edge of the drift at a single leap, and melted into the grayness of the mountainside. Probably forty minutes later I reached the drift, expecting to find the remains of a half-eaten goat somewhere near; but not even in the snow, which was hard and icy, could I find a trace of the beast. Once on the cliffs, I found goats everywhere and was chasing them most of the day, but I was never able to discover any commotion among them except that occasioned by my own intrusion.

The snowdrift on which I found my lion (?) performing was just below the hole in the wall that is so clearly visible from the Many Glacier hotel on a bright afternoon, and probably not more than a mile, by goat trail, from Ahern Pass. The lion, if such, incidentally is the only one I ever saw in Glacier or any other park, in several thousand miles of hiking all the way from Jasper to the Kaibab.

* * * * *

Mangy Coyotes -- For some time it has been noticed that coyotes in this region have been suffering from mange. Those captured last fall brot forth the question how well afflicted individuals would survive the winter. Last month I saw a coyote with scarcely any fur left at all. A seasoned veteran he, surviving thus far without a coat the bitterness of winter, can but win the admiration of all. Call him "mangy" if you like; next summer he shall probably furnish you with lively vocal entertainment, the sore tribulation of the cold season being over. - Clyde C. Fouley, Park Ranger

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A RUFFLED REPAST

Chas. L. Croghan, Park Ranger

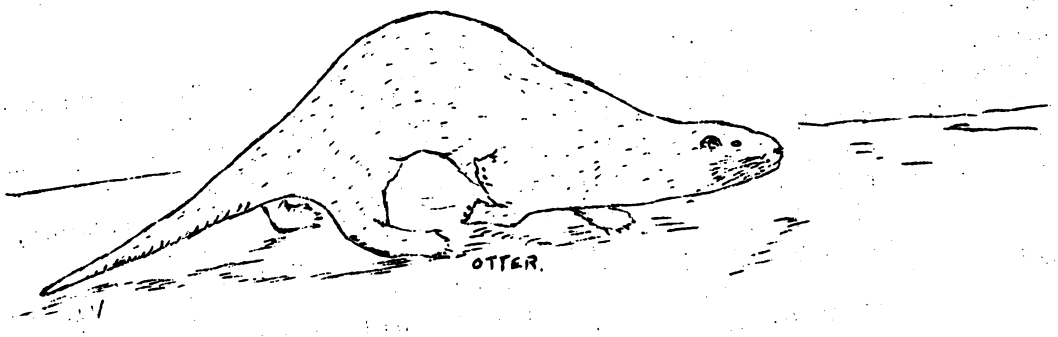
On an early January patrol up the North Fork, I witnessed a strange, heterogeneous fracas. Some distance ahead of me an excited aggregation of ravens and magpies were swearing and scolding noisily a dark object near the water. Thru my binoculars, I made out the latter as a bald eagle feeding upon the carcass of a deer. As I watched the tirade of the attackers, a coyote slipped quietly out of the brush and glided towards the deer. As he approached, the eagle ruffled its feathers after the fashion of an old hen with chicks until it looked twice as large as any eagle I have ever seen. When the coyote was within a few yards, the bird with wings held low and partly outspread suddenly sallied directly into the face of the intruder. The latter beat a hasty retreat to the shelter of the timber, but reappeared immediately thirty or forty yards to the rear of his assailant, which had returned to its business of separating meat from bone. With fine caution, the dog kept close to the friendly brush as he again approached to within a few yards of his goal. This time he aggressively met with red, snapping jaws the attacks launched against him. The eagle, rising only a few feet in the air, raked head and back with distended talons and pommelled viciously with its powerful wings. Again the intruding dog was forced to take to the saving brush, this time not to return.

Routing so successfully the single, powerful annoyer, the eagle returned to its table, but not in peace, for again the vexatious ravens and magpies badgered and tormented it. Discomposed and exhausted by their incessant altercation and importunity, it seized in its talons a delectable bone with some meat and hide clinging to it, and flew away over the tree tops.

As fable-telling Aesop might have summarized: One may easily break a strong limb by the strength of one's arm, and fail to break a bundle of weak sticks by the strength of their numbers.

* * * * *

In Our Question Box - "What travels on snow-covered ice by a series of short jumps thirty inches long and interspersed with occasional scoots or slides of six feet or more with only the imprints of the hind feet showing, there being no mark apparently left by the tail? Feet and body of this animal are evidently the size of a beaver. Such an animal traveled the entire length of Lower Quartz Lake in this fashion." Answer: An otter. These animals are known to progress on ice or slippery snow by a series of jumps terminated by sliding on the stomach. (See NATURE NOTES III, 23)



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GLACIAL DRIFT

MOUNTAIN CLIMBING IN GLACIER*

Dr. M. J. Elrod

Mountain climbing is to some people what golf, or fishing, or duck hunting, or horseback riding is to some others, a pleasurable pastime. They do not climb mountains because they need exercise, or because they expect to obtain scientific data by the ascent, although they may do so, but because of the joy of the effort, the exhiliration that comes from overcoming difficulties, and the supreme pleasure in placing the world beneath the feet, and viewing the sublime panorama spread before the gaze, panorama seen by few, and usually beyond word description. The desire to climb is from within, is unconsciously tantalizing until it is met, and rarely dies. The body may fail to function properly, but the gray-haired person looks with the longing of youth at the lofty summits and sighs for the vigor of early years. To the youth, to look may be to decide, to climb, to succeed, and to rejoice in the victory over the body and over the mountain. The memories of climbs never fade, but become more precious with years and with the accumulation of climbing experience.

Mountain climbing in Glacier National Park has never been written. Many have climbed peaks within and without the park. In few cases have th efforts been announced by the press. Isolated cases have been widely heralded for advertising purposes, but the climbs have been no more than dozens of other persons have made without advertising, and with no special equipment. Could all the mountaineers who have climbed the peaks and walk the Continental Divide in the park make record of their journeys, of the difficulty, the charming views, the delicate Alpine flowers, and the big game animals, it would be one of the most readable books of the park. It will never be written, for these mountain climbers are modest folk, not given to heralding their efforts or recounting their deeds. In some case information is reluctantly drawn from them, as though they were parting f a cherished treasure.

It has not all been pleasure. Alas! Tragedy has been written on se veral mountains of the park. The demands of mountain and ice are inexorable. Failure to meet the demands, through accident or ignorance, may re sult in disaster. To make the summit of a mountain, even of moderate height, requires a good heart, good lungs, trained muscles, good judgment and knowledge of what is safe and dangerous on cliffs and ledges. Some courageous and intrepid climbers have given their lives for the supreme moments of time which they anticipated. The tragic stories have been bu briefly told, and it is doubtful if the telling would prevent or deter others from effort, so great is the call and pull of the mountains.

There are more mountain climbers each year in Glacier National Park than the public realizes. While the mountains are not high, Mount Cleve the highest, being 10,438 feet above the sea, they are generally rugged,

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precipitous, and present difficulties of the usual kinds. The mountaineers look at the peaks, survey the possible routes with the eye, weigh the evidence, as it were, and in a few days will calmly report some evening that the climb was made. Among the climbers are tourists, chauffeurs, trail men, workmen on the roads, helpers about the hotels and camps, geologists, and members of mountaineer clubs. In some cases they begin by using the footpaths to the summits or ridges, where such have been built, soon selecting new and hitherto unknown routes up the slopes and along cliffs. In other cases the climbers come with experience, and seek new experiences and victories.

One young man, a highschool boy from Chicago, who had never seen a mountain before his visit to the park, was so entranced with it all that he begged for information. His joy seemed complete with several hours of conversation about mountain lore. Each day he tried something new and safe, and each evening reported success. In order to husband his limited funds he secured work and climbed during off hours. Before the end of the first season, within six weeks from his entrance to the mountains, he was assistant to the guide who took parties over a glacier. Such willing and eager students, who wish to learn how to conquer mountains, are not rare to the park, but frequently they are not found in time to make them more than beginning amateurs.

Contrast with the preceding the story of another and older person, who did not have the desire to learn how, but who thought he was quite proficient in mountain knowledge, although it was his first time in the mountains.

I was collecting butterflies and flowers for the exhibits, and was accompanied by a gentleman with gray hair and an undue timidity. Indeed, his timidity was unreasonably exasperating. We had climbed to a basin, collected our material, eaten lunch, and were ready to return when voices were heard on the cliffs five or six hundred feet above us. It was possible to converse by slow and careful enunciation. Two men were visible on the cliffs. One of the two was played out. They wanted a rope. For what? To get down the cliffs. They could not have one. Why not? Because we had no rope. If they would but follow instructions, they could come down to us. Conference held on the cliffs above. This is impossible because one of the two says he can not do it. Then tell him he must go back the way he came. Another conference, with report that he is too tired and cannot possibly make it. Then the ultimatum is given. Tell him, then, he must stay all night where he is. My companion asks what is now to be done. My reply is that they will agree to follow instructions. But if they will not, then what? I will go up and bring them down. He thinks that can not be done, but I know, for I have gone up the very way they may come down, and it is not difficult nor dangerous.

The conference above ends, and they call for instructions. In less than twenty minutes they stand beside us. One was young and vigorous, and could go anywhere. The other was panicky, and wore bifocal glasses. They had climbed the footpath from Many Glacier to the top of the ridge near the summit of Mount Altyn, a distance of 2,400 feet, and decided to go down on the other side, where there is no trail. Not understanding mountains, they could not determine a way of descent, and but for our accidental presence would

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most likely have stayed out all night, and perhaps caused a search to be made for them.

The younger generation will dare and try much more frequently than their elders. Few learn mountain climbing in middle or late life. But once they get the spirit of the mountains, no matter what the age of the person, the call is very great. Not knowing the exhiliration that comes from the view of even a modest ascent, almost any reasonable method of daring and taunting is sometimes permissible, even allowable, to produce this end.

Two large, gray-haired men from the Mississippi valley had motored to the park with their wives, had stopped a week at Many Glacier, but had not climbed on foot or ridden horseback. After considerable bantering they were induced to make the climb of 2,400 feet by the foot-path to the ridge of Mount Altyn. This is not difficult. Hundreds, perhaps thousands, do it each season. On reaching the top they were delighted, and were very profuse in their expressions of appreciation and admiration. During the conversation I observed a small clump or cluster of the Alpine forget-me-not growing in a cup-like depression in a big rock. The deep blue petals were as delicate as the sky whose color was reflected, in a small way, in the tiny plants. I suggested to one of the gentlemen that he take a few of those true Alpine forget-me-nots, from the top of the world, as a present to his wife. A small cluster was wrapped carefully and safely stored in his pocket. We returned by another way, ignoring the trail, giving them a touch of descent by shale, cliff, timber and grassy slope. Of course they soon lost their bearings, but the view down was always open. We made the dining-room at the last moment. As they were recounting their experiences, the one bearing the floral message suddenly thought of his delicate flowers from the mountain top and broke forth thus:

"By the way, my dear, I brought you some flowers from the mountain. They are -- what did you call them, sir?" turning toward me an anxiously inquiring face. His wife gave assurance she would not let him forget what they were.

There are several footpaths to the tops of mountains. One goes to the top of Mt. Brown, at Lake McDonald. Another leads to the top of Goat Mountain, at Going-to-the-Sun. All of the trails are used by foot travellers as well as horseback riders. Perhaps less than half of the park visitors take the footpaths or trails. The others are content with what may be seen from the bus, automobile or boat.

To climb a mountain by train is nothing. One does not even appreciate the height of a climb where a horse is used. One knows a mountain only when he climbs it and puts it under his feet by his own efforts. But the real mountain is encountered only when there is no trail, when a way must be found, and where judgment must be used constantly. It is on these occasions when the tragedies have occurred.

A few years ago a quiet and unassuming young man came to Many Glacier, with whom I chanced to have conversation. He had started in New Mexico or

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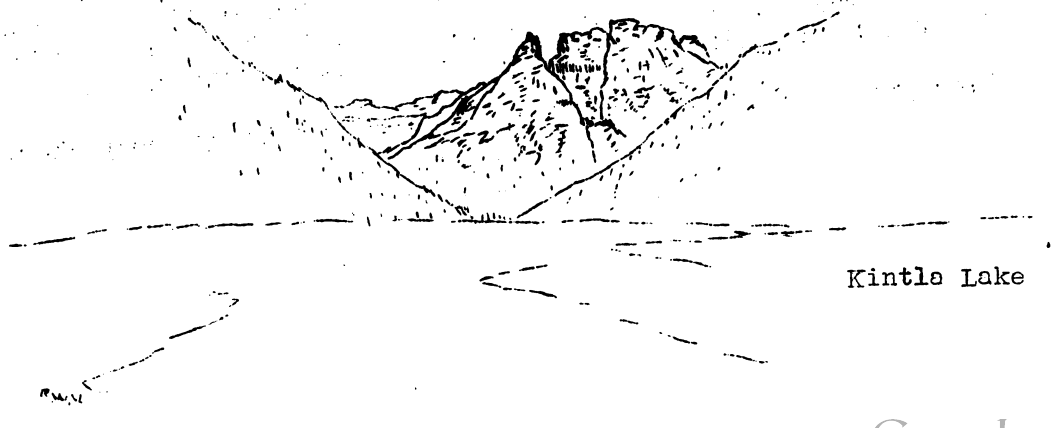
Southern Colorado, the former, as I remember, and was walking the Continental Divide, whenever he could, from his starting point to the boundary line. He had traveled hundreds of miles on or near the divide, keeping as near the summit as he could. He traveled hundreds of miles where there were no roads, through brush, crossing streams, over rock masses, along open mountain slopes rarely seeing human beings, and often far from roads. His idea was quite different from that of the ordinary traveler, and I very much desired to prepare a story for the press, outlining his plan and stating what he had done and yet had to do. His immediate response was negative. At Denver he had given an interview to newspaper men, and the stories they prepared, he said, made fun of him, as though he were a bit "off". Not having funds for other forms of travel enjoyment, he was using his own muscle and energy to do a real stunt, as real to him as an endurance flying test, a long automobile journey, or a walking trip across the country. He thought people should be glad to know there was a person who was willing to endure the hardship of such a journey, and who had both the courage and the energy to undertake it. He was continuing his journey, was enjoying it, notwithstanding the difficulty, exertion, and hardship. He did not want newspaper or other notoriety about it. He did not care whether people knew about it or not. It was a whim with him, something out of the ordinary, something difficult and strenuous, and he was doing it with the same spirit and for the same reason that other people do their unusual performances, except that he was not seeking, expecting, or desiring newspaper publicity. The next day after our evening conversation he was again on his way, up the trail to the pass, and as near to the divide northward as he could be and continue travel.

There are more of such people than we suspect. They care not for notoriety or publicity. They prepare for travel, harden their muscles, and start. Storm and rain do not deter them. They are able to take care of themselves in emergency. They can cook, camp, find their way, and keep oriented under the most trying conditions. They do it for the love of adventure, for the joy of doing, for the pleasure of conquering or overcoming nature, and for the exhiliration that comes with success and from the views and experiences.



Kintla Lake

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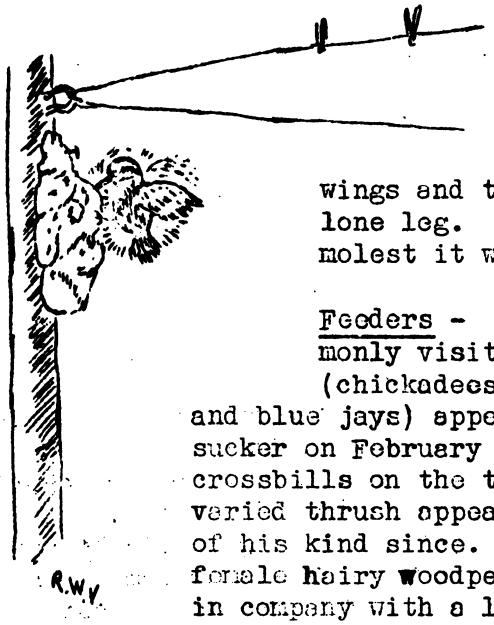

One-legged - Among the many chickadees frequenting our feed-rack is a one-footed chestnut-backed individual. With great difficulty, it gleans its morsels from the suspended suet by rapidly fluttering wings and tail; intermittently it rests upon its lone leg. Other chickadees deferentially to not molest it while it is feeding. - Ruth W. Vincent

Feeders - Among the different kinds of birds commonly visiting bird feed-racks at Headquarters (chickadees, camp robbers, nutcrackers, nuthatches and blue jays) appeared a solitary female Williamson sapsucker on February 1, a bluebird on the sixteenth, three crossbills on the twenty first. On February 8, a lone veried thrush appeared; He has been followed by many others of his kind since. Other callers of the month were male and female hairy woodpeckers and three small-sized woodpeckers in company with a larger female woodpecker*.

- Ruth W. Vincent

Sea-gulls - Gulls winter along the sea coast, migrate to inland lakes for nesting and summering. A flock of gulls appeared on January 6 on Waterton Lake to remain for several days. - L. O. Hanson, Park Ranger

Bread-crumbs - A pair of pine grosbeaks have lingered near the (Nyack) station all of January. Each morning they came for their bread-crumbs and hot cakes. - C. G. Harkins, Park Ranger

Woodshed Headquarters - A marten has wintered near my Nyack ranger station all winter, making the woodshed his headquarters and home.

- C. G. Harkins, Park Ranger

Deer Feed - Approximately two hundred deer feed at my (Logging) ranger station feed yard every day. - Chas. L. Croghan, Park Ranger

Lion or Lynx? - Ranger Lou Hanson of Waterton District reports that the "lion" (NATURE NOTES III, 90) that was ranging on Boundary Creek in November has moved over to Waterton Valley. His footprint, about three and one-half inches in diameter is to be seen between the station and Camp Creek. I personally am of the opinion that this track is that of an especially large Canadian lynx as I have seen lynx signs in this same locality before. Moreover, the prey of mountain lions is elsewhere at this season. Deer winter near the headquarters of Waterton Lakes Park and elk are very scarce in this district. If a lion wintered here, its signs would therefore be seen near the foot of the lake where the blacktail (mule) deer are found. Only rabbits and grouse, natural lynx prey, are to be found in the vicinity in which Lou has been seeing the tracks. - Forest L. Carter, Chief Ranger.

* The smaller probably being Batchelder, the larger a hairy woodpecker.

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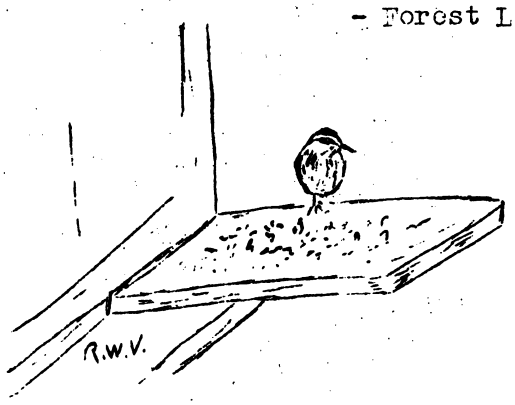
Yellowstone Fashion - Many a pool and stream of Glacier's celebrated neighboring National Park teems with life, animal and vegetable, even thruout the coldest days of winter because of an abundance of warm water in the region. To any one acquainted with Yellowstone's winter life, more than casual interest might be found in the following report of Ranger Clyde C. Fauley of the Two Medicine District: "There is a small spring above the ranger station which is always open and warm. Even in January it contains much green vegetation. The water mosses teem with ostracods and larvae of May-flies. A natural balanced aquarium, it is especially attractive to the cheerful ouzel who adds to the charm of this miniature arena of life by bursting into ecstatic song even on the coldest days."

Yosemite Fashion - Common enuff in our warmer parks, Yosemite for example, is the rummaging about of bears on balmier days of winter. There, hibernation consists of a series of interrupted comas. Not so in the colder parks such as Yellowstone and Glacier in which the bears sleep from fall until spring. Glacier's balmiest winter has produced, among other things, the following bit which is also taken from Mr. Fauley's Ranger Report for January: "The abnormally warm weather of the past few days caused at least one bear to awaken for a stroll thru the wet snow. On January 30, a bear track was seen near Forty-mile Creek." He continues with the following which is also of interest. "Skunks which normally show up in the latter part of March were out in force during the last week of the month". Commented Chief Ranger Carter on Mr. Fauley's report as follows: "It is the first time I have heard of a bear coming out of natural hibernation in January. I have been told that they have been known to awaken when hibernating under a building if they were in the habit of being fed, but I do not know of a similar instance ever occuring in the mountains. On the other hand, I have seen skunk signs at different times during winter months. They are not true hibernators and will come out of their dens any time the weather warms up. The latter part of January and all of February is their mating season. At that time they come out and travel, if the weather is at all favorable.

Pussy-willows - Warm weather has swelled buds on many trees. Pussy-willows are out along the North Fork. - H. W. Doust, Park Ranger; February 1, 1931

Snowfall - Snow precipitation for the park is below half normal this winter. In average seasons snow measures fully five feet deep at the head of Two Medicine Valley; three or four feet in the vicinity of Two Medicine Lake (Middle). This year there are only two feet and one foot of snow at these places respectively. - Forest L. Carter, Chief Ranger



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Snow Mosquitoes - Mosquitoes that do not bite; mosquitoes that do not have the querulous sing-song that drives men mad; mosquitoes that fly about in the dead of winter: such are not the mosquitoes with which we are too well, too forcibly acquainted when summer brings twilight. Of such attributes is a local species, large and dark brown, generally known as the snow mosquito. It was to be seen on warmer days of the past winter on the west side of the Park. Comes springtime, the females will lay their rafts of eggs in somewhat triangular masses upon the surface of permanent pools in the dark forest. Here the young larvae will wriggle about, pupate, and emerge as the next generation of hibernating mosquitoes.

Authors of This Issue - Mr. Eivind T. Scoyen took over the reins of Glacier's Superintendency on January 16 (See NATURE NOTES III, 78). Born thirty-four years ago at Yellowstone's Mammoth Hot Springs, he has spent practically his whole life within the National Parks. He attended St. Olaf College at Northfield, Minnesota, and served in the Navy during the Great War. Before coming to Glacier, he served as Park Ranger in Yellowstone (1919), as Chief Ranger of Grand Canyon, and as Superintendent of Zion and Bryce Canyon National Parks. With Frank J. Taylor, co-author also of Director Albright's popular, great "Oh Ranger", Mr. Scoyen has written a book (not yet released), "The Rainbow Canyons".

Little need be said of Dr. M. J. Elrod, for his name and articles have frequently appeared in GLACIAL DRIFT. Author of the adequate, splendid "Elrod's Guide and Book of Information of Glacier National Park", recently revised and much enlarged, and genial, beloved Nature Guide at Many Glacier for eight years (See NATURE NOTES II, 2, 27), Dr. Elrod's name and biographical sketch appears among those of other celebrities in "Who's Who". He is head of the department of biology at the State University of Montana.

Mr. C. S. Van Nuis of "Hopecrest", Kearsarge, New Hampshire, was guest of Glacier National Park last summer. The enthusiasm stirred in him by Glacier's daughty gallant of the mountain stream prompted the creation of the lovely little poetic contribution to GLACIAL DRIFT.

Charles L. Croghan, thirty-eight year old ranger of Glacier's Logging District, has spent practically all of his life in outdoor work. Calling the wild mountainous district of northern Wyoming and northeastern Oregon home, he ran traplines on snowshoes and skiis from the time he was fourteen years old. For two seasons he served as ranger in Crater Lake National Park before coming to Glacier. As right-hand man to the late, efficient Chief Ranger William C. Godfrey of the former park, he won praiseworthy descriptives, since justified by his work in Glacier, such as "competent, energetic, and reliable", "one of the best all-around rangers in any National Park". A student of geology and the natural sciences, he is as well posted along educational lines in connection with work in the National Parks as is the average ranger naturalist. As a photographer, he is beyond the amateur class.

Of G. M. Kilbourn, former walking guide of the Park Saddle Horse Company, much will be said in the succeeding installments of Dr. Elrod's present article on "Mountain Climbing". See also the next issue of GLACIAL DRIFT.

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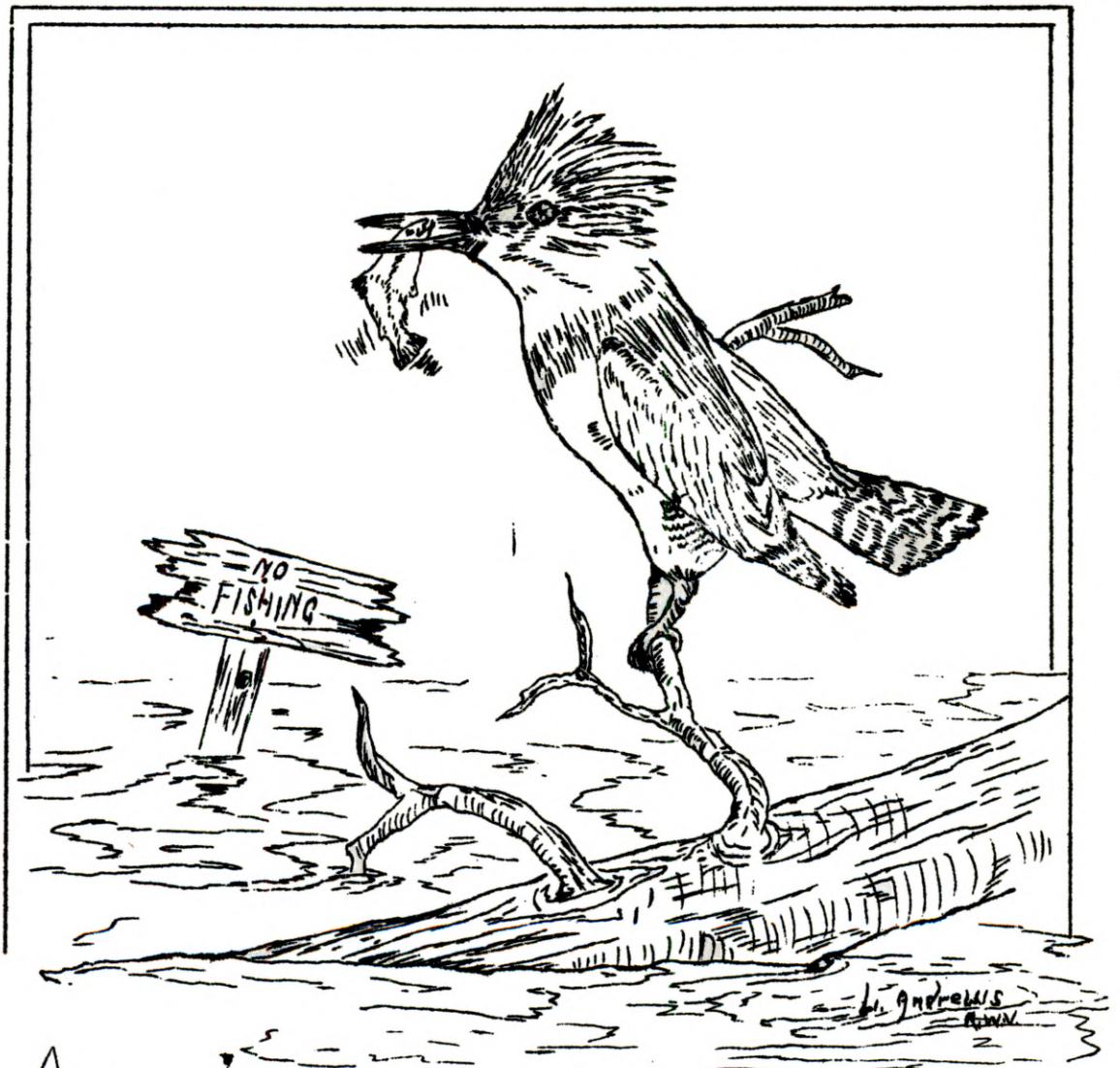
GLACIAL DRIFT

NOTES FROM GLACIER NATIONAL PARK



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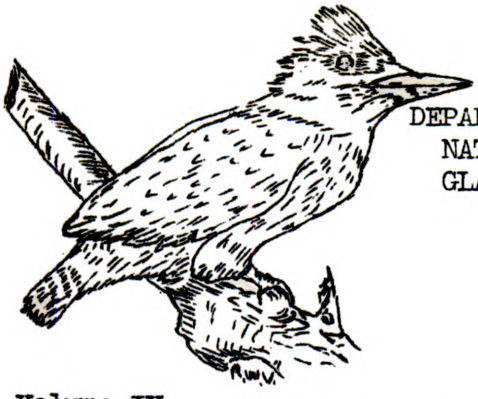

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GLACIER NATIONAL PARK

GLACIAL DRIFT

Volume IV April-May, 1931 Numbers 4 and 5

A monthly pamphlet edited by the park naturalist and distributed by the Educational Division of Glacier National Park to all interested in the Park and its natural history.

Eivind T. Scoyen, Park Superintendent Dr. G. C. Ruhle, Editor

"STUDY NATURE; NOT BOOKS." (Agassiz)

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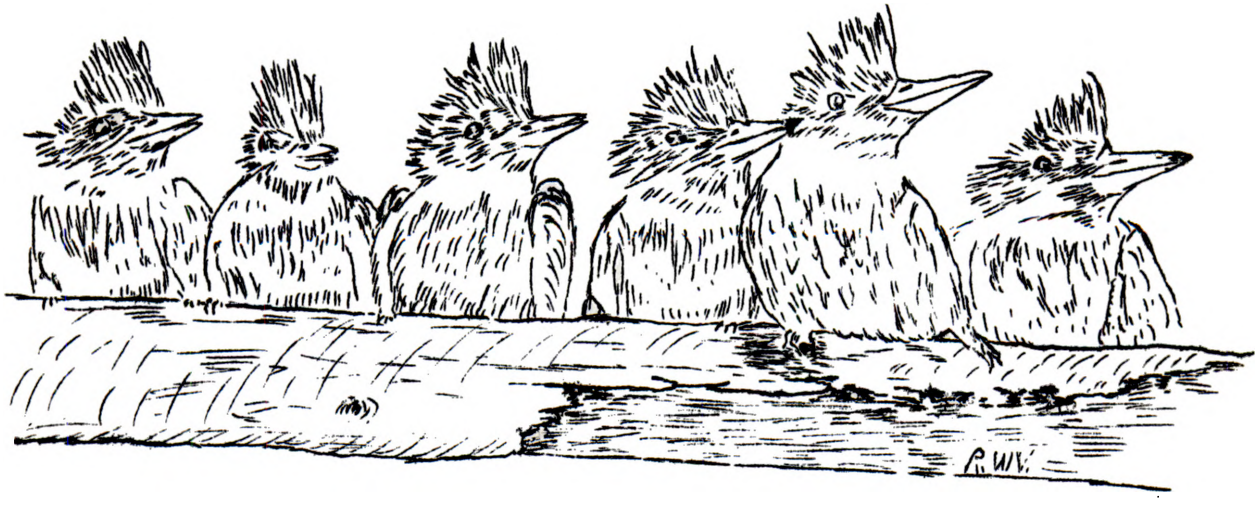

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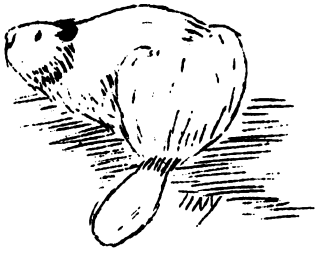

STRICTLY ACCIDENTAL

Dr. C. M. Shepard

Mr. Fisherman, if you were peacefully flyfishing on a lazy September afternoon, and suddenly found yourself possessed of a fifty pound beaver on the business end of your tackle, just what would you do? Admittedly, it is a predicament which not many sportsmen find themselves in, and certainly it was not one for me to relish, especially upon a federal preserve which wisely and emphatically prohibits malevolence and harm to all of the wild creatures within its confines.

I was deeply engrossed in casting from the bank of Swiftcurrent Lake near the inlet of Swiftcurrent River. My tackle consisted of a six-ounce, nine-foot rod, a twelve-pound test line and a number eight hook. The casts were made in line with the incoming stream current, and a down-stream breeze was carrying fly and leader well out. Just as one long cast was straightening out, a large beaver arose immediately behind the terminal end of the leader and fly, against which the current straightway carried him. The thick fur of his neck and chest became hooked at once.

"Now," said I to myself, "you have gone and hooked a beaver. And what are you going to do about it? He'll smash your tackle if you're not careful and hurt himself in the mix-up. Neither of these must happen."

I threw up the rod to take the strain and to permit the beaver to test the line and his powers, and possibly to get loose also. He headed out into the lake until the tightened line and bending rod slowed him down to a stop and actually drew him back, much to his great surprise. As tension diminished, he headed lakeward again until stopped as before. Now he lunged mildly as if to disentangle himself from the annoyance, but the thing, whatever it was, clung tightly. So he turned, dived and headed directly towards me. The water was clear and the bottom, six feet below, was clearly visible. I reeled in rapidly as I watched him swimming deep in the stream. Suddenly he saw me. He straightway swam back into the lake about fifty feet, coming to the surface as the line tightened and the rod was beginning to take the strain. Three times he made strong efforts to swim away, each time in a different direction. Three times he was halted and dragged back by the recoil of the rod.

This was too much, even for a perseverent beaver; and so it became necessary to change tactics. He began a most spectacular series of broncho-bucking that any one has ever seen performed in water. He struck out in all directions with feet, legs, tail, body and head straining simultaneously. He thrashed water into a column several feet high and as many in diameter. In less time than it takes to tell it, his frantic efforts dislodged hook and again he was free. The hook was reeled in, filled with tell-tale beaver fur, but without the slightest evidence of flesh-cutting or contact.

One would expect any beaver to flee precipitously from the scene of such discomposure but not so with this one. He dived under for a moment and

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came up less than seventy-five feet away to the left. He stopped, reeled about and lay quietly on the surface staring at the fisherman with all his animal curiosity. He turned his head from side to side as if to get in all the angles. For several minutes, he studied the situation, for all the world apparently wondering just what latent force was active in his lake that could catch and hold him so mysteriously. He swam to the right and stopped to continue his close scrutiny. Three times he swam back and forth to make all the observations his little faculties could permit. Apparently satisfied over the solution of the mystery, or reconciled to its apparent imperspicuity, he slapped his tail upon the water and swam off to spend his night of feeding and wood-cutting.

* * * * * * *

THE BELTED KINGFISHER

G. C. Ruhle, Park Naturalist

Overcome by grief for her drowned husband, Halcyone, daughter of Aeolus, cast herself into the sea. But the gods, out of compassion, transformed the two into kingfishers to fly back and forth over the waters, to take from them the means of life, to build a floating nest at sea at the time of winter solstice, and to calm the water during the period of incubation.*

Such is the mythical ancestor of our picturesque Ceryle alcyon,† the common belted kingfisher, widely distributed North American representative of an almost cosmopolitan genus. His rattling cry, generally clattered while in flight, is intimately associated with open waters. Of no retiring disposition, his appearance is well-known to angler and nature lover: the slaty blue upper surface, white underparts, blue neck band, jaunty crest, large head and dagger-like beak. His mate resembles him except that she has an additional band of brown across her breast. As they watch and wait for prey, kingfishers are wont to sit motionless on favorite exposed perches from which they dart forward, hang poised in mid-air for a moment, and plunge headlong into the water. Their food consists mostly of small fishes like chub and minnows, but sometimes is varied with insects, small reptiles and amphibians, at times captured at a distance from water. Kingfishers usually build their nests in burrows in dirt banks.

Fingerling minnows and their ilk taken by kingfishers as food can well be spared. Despite the inconsequential economic status of these birds, there are anglers who raise a cry for their extermination, "just because kingfishers eat fish". Quite differently from such selfish category arises the necessity of shooting kingfishers that congregate in numbers around fish hatcheries, that fare destructively on tender hatchlings. Last season, operators at Glacier Park Hatchery were regretfully forced to execute a score of birds squatted in the neighborhood to glean an easy living, that refused to be driven away by any means attempted.

* A period of calm lasting approximately two weeks; hence, "halcyon days".
† Ceryle, from the Greek κήρυλος, kerulos, a kingfisher; alcyon, Latin, a kingfisher.

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MOUNTAIN CLIMBING IN GLACIER

Dr. M. J. Elrod

One evening a young man made some inquiries, wishing to know if he could walk to Iceberg Lake from Many Glacier, return to the fork in the trail, go to Ptarmigan Lake, climb the mountain wall for the view, and return in one day, This meant a walk on trail of 20 miles or more, and an ascent of more than a half mile. After asking him a few questions, I was convinced he could do it easily, and so informed him. He then wished to know if I thought his wife could make the trip. For two weeks they had been walking and climbing together, and she was as physically able as he, according to his statement. I have never been strong for urging women to do strenuous physical stunts, and advised him not to allow her to do it. He wanted an opinion on her probable ability, and smiled at the advice. Of course she could. The next evening they both reported the trip accomplished, and they were grateful for the advice. They then planned other walking stunts for other days, and no one was advised of their performances. They did not seem to think it important enough to mention, except casually.

During past seasons members of trail crews, employees at hotels or chalets of the Park Saddle Horse Company, park employees, and men working on the Transmountain Road made many ascents on Sundays and vacations. It is difficult for some people to understand a man who works hard at physical labor all week and climbs a mountain on Sunday for recreation. But there have been many such in the park. To enumerate them all and tell of the mountains they climbed would make a lengthy, though interesting story. Some of these persons are natural mountain climbers.

Peter Hauser, one of the men at work daily on the Transmountain Road, deserves special mention. He is an Austrian by birth, 49 years old, and has done much mountain climbing for pleasure and for pastime. To him the ascent of a mountain is but a Sunday pleasure jaunt. While working on road construction on the Mt. Baker, Washington, Highway, he climbed Mt. Baker, 11,000 feet, and Mt. Shucksan. In 1925 he climbed Mt. Rainier and spent 48 hours on the summit alone. He has climbed Mt. Whitney and Mt. Shasta. In the park, previous to the 1928 season, he climbed Rising Wolf, Despair, Grizzly, Red, and Spot Mountains. During the summer of 1928 he climbed Clements, Reynolds, Oberlin, Gould, Pollock, Piegan, and Cannon. It is his custom to build a cairn of rocks on the summit. As one stands on Logan Pass, or on the Garden

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Wall trail, and swings field glasses from one summit to another, the monuments Hauser has erected are plainly visible.

G. M. Kilbourn, who was walking guide for the Park Saddle Horse Company during the past season, spent much of his time climbing mountains, sometimes alone, sometimes with others. In 1927 he climbed Altyn, Appekunny, Swiftcurrent, Going-to-the-Sun, Pollock, and Siyeh Mountains. He also climbed to the hole near the summit of the wall at Iceberg Lake. Here the wall is so thin it has broken away at either side, until an opening through the wall has been made. The roof of rock is 75 to 100 feet thick. From Many Glacier Hotel the hole looks like a tiny speck through which the sky is seen, although in reality the space from floor to top is quite high. The wall on either side appears precipitous, but is approachable.

His climbs in 1928 were made to examine various routes of approach and return. He made the ascent of Grinnell Point, Henkel, Grinnell (twice), Allen (twice), and Wilbur (twice), all in the Many Glacier region. Siyeh is the fifth in height in the park, 10,004. From Many Glacier Hotel to the top by Piegan Pass and return by Cracker Lake and Canyon Creek is not far from 25 miles, with a vertical climb of a mile. To do this is more than a full day's work, but Kilbourne was about in the evening seeking business for his company following a tramp that would take the heart of all but the most courageous, and the physically perfect. He says of the outlook from the summit of Siyeh "Its general view sweeps from far St. Nicholas on the south to Cleveland and the Canadian Rockies on the north. Its individual revelation is a peep at Cracker Lake, 4,000 feet below, deep blue in its cradle of cliffs and glaciers. Its mystery act is a dwarfing of the whole Garden Wall, with Grinnell apparently tucked away on little shelves, like letters in the farthest pigeon hole. Its mob scene is a grouping of the Blackfeet, Sperry, Piegan, Grinnell, Merritt and other glaciers into a single family portrait where miles of separation seem as only a few steps. To visitors who have not gone to the summit for a personal introduction, Siyeh seems but a big rock pile, the awkward, overgrown boy of the mountain family; but first in a whirling fairyland of fog, and later in the less spectacular but more rapture of a sun-kissed afternoon, I found its acquaintance worth all the disappointing footholds of an almost endless rock slope."

Kilbourne has climbed Pollock three times, not of necessity, but because on the first and again on the second attempt his Kodak pictures were not successful. His ascent of Mt. Gould involved trail travel from Many Glacier to Granite Park, along the Garden Wall several miles, and up the west side to the summit. This is a distance of perhaps fifteen miles, an elevation of a mile from the starting point, and, on returning, a total of nearly 30 miles. Few people in the park can attempt such feats. From the summit of Gould the vertical distance to Many Glacier is 5,000 feet, and to McDonald Lake on the opposite side it is 6,000 feet. He says "Mount Gould commands a most surprising assortment of 'peep-into-the-chasm' views in every direction, and affords a park wide panorama which in this section of the park is second only to that from Mt. Siyeh".

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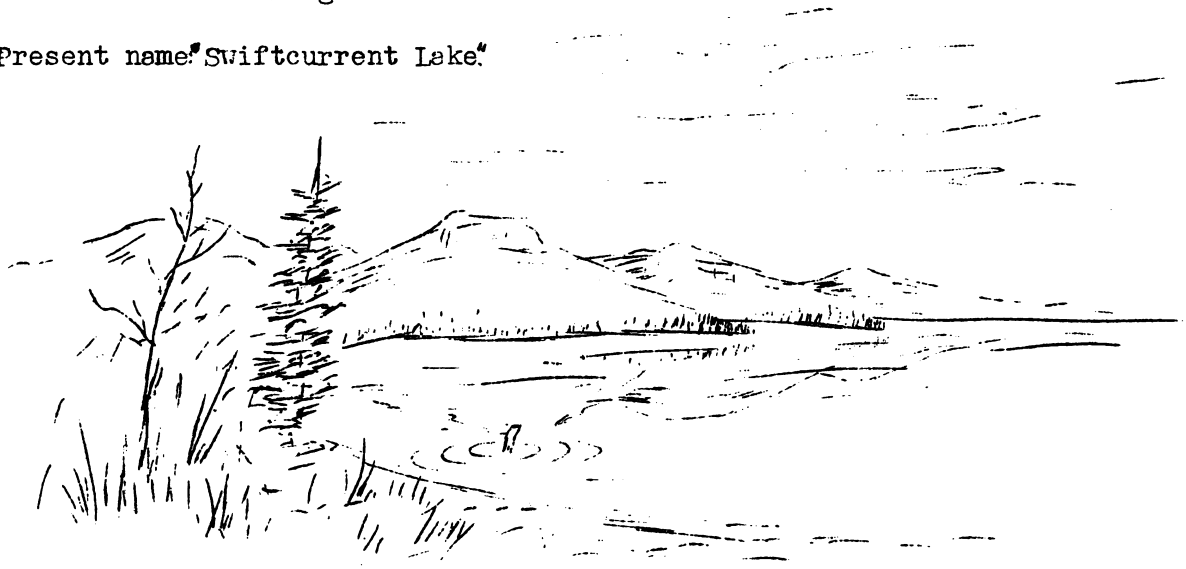
The climax of Kilbourn's climbing was Mount Wilbur, which viewed across Lake McDermott* from Many Glacier, presents a face of rock that seems almost vertical. He made his first climb on August 15th, alone. Six days later he repeated it, accompanied by a friend who did not reach the summit. The second climb was mainly to secure a better set of photographs than were obtained the first time. He attacked the eastern face by a slightly different way from the few who had preceded him. With the aid of glasses, he located a gully near the middle of the mountain, three-fourths of the way up, that broke the diorite cliffs into steps. From these he continued to the summit of the ridge. "One view from Wilbur, that of Iceberg Lake with its blue and white ice burden far below, is worth all the labor of clinging to the cliffs."

Leopold Seethaler, Swiss guide, who daily took a party of tourists from Many Glacier Hotel to and across Grinnell Glacier, is a real mountaineer. Early in the season, while stationed at Going-to-the-Sun, he made the first ascent of the north summit of Little Chief, by climbing the seemingly vertical crags. He climbed Going-to-the-Sun from the Sexton Glacier side, after taking his party to Grinnell Glacier and return. He left the trail five miles from the hotel at five in the afternoon, reached the summit soon after eight, and made the descent almost entirely after dark. A young man who accompanied him did not make the summit, but waited on the diorite rocks a few hundred feet below the top for Seethaler's return. So great was his thirst on the hot August day that the limit of endurance was reached so near his goal. On occasions Seethaler entertained guests of the Many Glacier Hotel by climbing to the top of a tall fireplace chimney, using only the rock projections as holds. He was a cool, deliberate guide who could pick a route with a glance of the eye. He was fearless, but extremely careful, and could tell instantly whether a rock wall was unscalable, or whether there were hand and foot holds for an ascent. He loved the mountains and it was quite irritating to him to repeat daily the trip over a glacier that can easily be traversed from end to end and from side to side. Those who do not know mountains, who have never climbed to highest places, just to see and to feel, can not appreciate the full meaning of this brief, prosaic statement of Seethaler's cliff scaling.

*Present name "Swiftcurrent Lake."



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EDITORIAL PAGE

HAPPY PEOPLE

If, gentle reader, you will permit me again to draw example from the Bible, I should like to bring forth the picture of the passing-by of the Great Physician: His presence emitting a magnetism to which even the blind are sentient, His mere shadow's falling upon sick and maimed to restore physical soundness and spiritual joy. The Christian proclaims that as the Christ. Small wonder, Robert Browning can use such a figure to stir the imagination and the soul of a keen, analytical, mentally alert Karshish, youthful pursuer of knowledge in medical science that he was. Small wonder that Karshish dotes upon the magnificence of the idea that the very God, the All-Great, were the All-Loving, too.

It is mid-summer at Sperry Chalet two years ago. An octogenarian listens patiently as a ranger naturalist unfolds to him the loftiness of the ideals and purposes of the Educational Service. "Well," concludes the listener, "I perceive your life and mind characterized by exhilaration, color and power to which you have personally added service to a public, which, even tho of the extraordinary National Parks' variety, is certain to be as trying at times as it often is thankless. Despite this latter, your demeanor constantly shows consideration, patience, courtesy and tact which is all the more graceful because of its apparent unconsciousness and ease. The whole matter is, nevertheless, so remarkable and surprising for this day and age. Can you, will you tell me the personal motive behind all your pains?"

"Perhaps, then, you should judge me not so unselfish, after all," blushes the naturalist. "I am happiest only when I can awaken happiness in other people. So you see, therefore, it is only my own happiness that is ultimately behind all this that seems so generous and noble. Yet it thrills, uplifts me, gives me new energy to carry on, if only I think that a few might feel that Life is all the sweeter because I, as naturalist, crossed their path, even if only for an instant." Christ's shadow falling upon the unfortunate and the resultant life infinitely and permanently enriched! A blessing for both giver and receiver! As beautiful as the peace of the Apostles which going out to unreceptive homes, returneth ever to bless the one who sends it.

And thus a naturalist has found his golden key to Heaven. Life's greatest quest is such a quest for enduring happiness and greatest satisfaction, diversified as individual opinions may be as to what constitutes these diaphanous consummations. I personally believe that greatest happiness abides in the mind that is not cloyed with triviality and froth, but that is filled with significant, interesting thot; in the soul not cramped by narrow horizons, but that is stirred by the lofty powers in life such as love, music, and art, and by the sublimities of Nature. Such is the cultivated mind and sensitive soul of people that are happiest. Such are those whose presence radiates, whose passing shadow awakens happiness in others, with the ultimate result that they themselves are permanently and infinitely enriched.

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TILL

Rocky Mountain "Blacktail" Deer - The question arises periodically: "Do we not know that Glacier has no true blacktail deer?" Just as it is thruout the whole region it inhabits, the mule deer (Odocoileus hemionus hemionus) is locally called "blacktail". This in inappropriate, since the tail is wholly white, except for the black tip. Moreover, the name rightfully belongs to the Columbian blacktail (Odocoileus columbianus) which has a black tail and which is known by no other common name. This latter deer is smaller than a whitetail and much smaller than a mule deer. Its range is confined to the Pacific Coast, from central California to the north end of Vancouver Island. Glacier Park has not, and probably never has had, native Columbian blacktail deer.

At Logging Feed-yard - At the beginning of March, one hundred fawns, sixty does and forty bucks, all whitetail, were getting feed at the ranger station. This number had decreased by twenty-five percent by the middle of the month. Of the bucks still coming to the yard, one, a three-point buck, is still carrying last year's antlers, while two others are carrying hair-covered bumps as large as hen's eggs, the start of new pairs of antlers. The first bucks without antlers appeared in the feed-yard last December 15.

- C. L. Croghan, Park Ranger

Flags - Among themselves whitetail deer are quite cantankerous, and pound each other unmercifully with their sharp hoofs. Among other animals they are decidedly peaceable or timid, hoisting their white flags at the least disturbance. It has been suggested that does may use their flags as a sort of tail-light to guide their fawns thru the deep woods, and at night. Be that as it may, it is a fact that the flag of the female is larger than that of the male. - C. L. Croghan, Park Ranger

Kishenehn Moose - Several moose have wintered on Kishenehn Creek near the Canadian boundary, about four miles above the ranger station. Many times have I seen their tracks and signs, but only recently did I get my first glimpse of the animals. The bull is the largest that I have ever seen. I carefully measured the height to which his shoulders came on a nearby tree. To my great astonishment, it was slightly over seven feet to the ground.* When I was on Kenai Peninsula, Alaska, a moose six feet high was considered a large animal. I am now wondering how big they grow in Glacier National Park. - H. W. Doust, Park Ranger

At the Many Glacier Feed-yard - Seventy-one mountain sheep were being fed at the Many Glacier feed-yard during February.

- William Asker, Park Ranger

* W. T. Hornaday, in his "American Natural History", says that eighty-four inches was the height of the shoulders of the largest moose of which he has any record, an animal shot in New Brunswick, in 1901, by Carl Rungius, celebrated animal painter.

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Goat on Boundary Mountain - On the steep snow-free sides of Boundary Mountain directly above the snowshoe cabin on Kintla Lake, I saw three bands of mountain goat, numbering nineteen individuals. A few hours later, at about four in the afternoon, they made their way up the mountain following their leaders in true goat fashion. - C. W. Doust, Park Ranger

Porky's Stroll - As slow-moving as he is dull-witted, a porcupine will often cover a surprising distance by his persistence. On the morning of March 5, I encountered the tracks of a porcupine on the North Fork Road in back of Fish Creek ranger station. Following these, I discovered that he had made a round trip from the top of McGee hill sometime between the snowstorm of the early evening before and my arrival at nine in the morning. He had diligently followed the road for a distance of some ten miles, tho his footprints were rarely spaced at more than six inches apart. At no place was there any evidence that he had eaten, nor had he met any others of his kind. Had he, like so many summer visitors to the park's glories, made the trip for the sheer joy of hiking, only?

- C. L. Croghan, Park Ranger

Raw Ham and Bacon - A marten is making Cattlequeen snowshoe cabin his home this winter. He can be enticed from his nest with bits of raw ham and bacon, but either of these meats cooked are disdainfully scorned.

- Earl F. Dissmore, Park Ranger

Western Bluebirds - Common enuff in Glacier National Park as elsewhere thruout this region is the celestial mountain bluebird, the all-blueness of the male easily distinguishing it from any other bird of the region. Unrecorded in Bailey's "Wild Animals of Glacier National Park" is the rarer western bluebird with red breast and blue chin. Aretas A. Saunders in his "Birds of Montana" writes of this latter, "A rare summer resident in western Montana, west of the continental divide, occuring still more rarely in migrations, east of it. There appear to be no previously published records of this species in Montana other than the reference, 'Breeds ... east to ... western Montana' (American Ornithologists Union, 1910, page 367)." Mr. Saunders further mentions a record in the Biological Survey of its appearance at Columbia Falls on June 28, 1895. On April 2, the superintendent and the park naturalist saw a male western bluebird perched in full view on a burnt larch standing on the shore of the bay a mile above Fish Creek ranger station. A half-hour later a pair of the same birds were seen. From Mr. Saunder's records, it seems that these are the earliest spring records of western bluebirds in Montana, as well as the first record of these birds in the park.

- G. C. R.

Among the Birds - To the park naturalist's desk came the following bits of bird news during the past month: Thomas Sullivan, ranger at Polebridge, reported seeing a kingfisher in February, almost two months before his slated arrival. Ranger Harkins at Nyack, reported purple finches at this station during the last week in February. He also reported seeing killdeer on March 20. Hugh Buchanan told of a male Chinese pheasant that had wintered at the head of Lake McDonald; his wife saw a flock of them nearby at various times. Undoubtedly, these introduced birds, not wanted in the confines of the park, have drifted in from the Valley. Ranger Clyde C. Fauley reported

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an abundance of large owls, no doubt lured by this year's great numbers of rabbits which make living easy for them. Both cedar and Bohemian waxwings have been much in evidence thruout the winter. Pine grosbeaks and crossbills have also been frequently seen thruout all the winter months. Robins have been seen within the park every month of the passing winter; bluebirds, in every month except January.

Heedless Ptarmigan - I saw a white-tailed ptarmigan in summer plumage near Redrock Falls on February 25. - William Asker, Park Ranger

Beggars - In past years, Clark nutcrackers, steller bluejays and camp robbers are noisy beggars at the door of each occupied cabin in the park. This year, on the east side of the park, at least, the old intimates are not given to begging, but their old role is aptly taken care of by magpies.
- Clyde C. Fauley, Park Ranger

Wood ducks - A brilliant display of reds, yellows, greens, blacks and whites is the plumage of our most gorgeously-colored duck, the wood-duck, so-called because it nests and perches in trees. On rare occasions it is seen in Glacier National Park. A pair nested near Avalanche Camp Grounds in 1929. In June of the same year, the park naturalist saw a wood-duck at Many Glacier which tried to find an alighting place on a hot horizontal stovepipe protruding from a tent. He is interested in learning from Ranger Harkins about a pair that was seen around Nyack ranger station in the latter part of February.

Columbian Sharp-tailed Grouse - Brush-loving western counterpart of the prairie-loving true prairie-chicken is our Columbian sharp-tailed grouse. Sad, murderous has been the story of the former bird which in large numbers once strutted, courted, boo-hooed into its orange neck pouches in the springtime. Joy and sport were the lot of every farmer and his lads who could rightfully hunt this splendid upland game bird in the fall, until its great numbers dwindled almost to extinction before the relentless gun-fire of game-hog and market-shooter. Despite the sad fate of the prairie-chicken, the story of the sharp-tailed grouse began with the same sad episodes, so that now it is extinct in places where formerly it roamed in abundance. All bird-lovers will be glad to hear that the sharp-tailed grouse is increasing in numbers along the eastern Plains-bordered boundary of the Park. For February, every ranger on the east side reported seeing these birds in numbers.

In This Number - To followers of basketball in Montana, Lloyd J. Andrews is well-known as stellar sophomore center of the State University team. To the park naturalist, he is known not only as a good friend, but as a promising artist. Inspired by a visit to the park in March, Lloyd drew this month's cover for GLACIAL DRIFT. Mrs. Vincent transferred the original to the mimeograph stencil. These the editor acknowledges with his thanks.

Last September, the editor enjoyed conversing with a guest who has spent considerable time in the park with his wife. This man, a lover of fishing and of park wild life, told of his remarkable incident of unintentionally hooking a beaver. Upon request, he kindly wrote out the story of the incident which is included in this issue. Dr. Cassius M. Shepard practices orthopedic surgery at Columbus, Ohio.

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GLACIAL DRIFT

NOTES FROM

GLACIER NATIONAL PARK

JUNE 1931

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UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
GLACIER NATIONAL PARK

GLACIAL DRIFT

Volume IV June, 1931 Number 6

A monthly pamphlet edited by the Park Naturalist and distributed by the Educational Division of Glacier National Park to all interested in the Park and its natural history.

Eivind T. Scoyen, Park Superintendent Dr. G. C. Ruhle, Editor

"STUDY NATURE; NOT BOOKS." (Agassiz)

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City-stifled, his wilderness retreats scaled down to green patches called parks, the average American urbanite must be contented with even his Outdoors in a synthetic form. The flowers of his woodlands are reduced in numbers: he counts his violets by twos and threes, he rhapsodizes over single arbutus blossoms. It is in our western National Parks that cramped cityfolk can see flowers in countless thousands. Glacier National Park, in particular, flaunts its floral displays by the acre, not by the bouquet. Of all Park flowers which strike the visitor with their massed beauty, it is the Glacier Lily before which one's rapture is longest sustained. The yellow, delicately fashioned petals wave in a breeze from over snow-mantled peaks; the flower lingers in some localities till late in the season. It constantly reminds of its smaller Eastern relative, the Dogtooth Violet. When we see vast carpets of the Glacier Lily at Logan Pass or at Iceberg Lake, we find it hard to forget the words spoken so long ago in distant Palestine but ever startling us still, "Consider the lilies of the field." The rest of the parable is before our eyes. - W. Stephen Thomas, Ranger Naturalist

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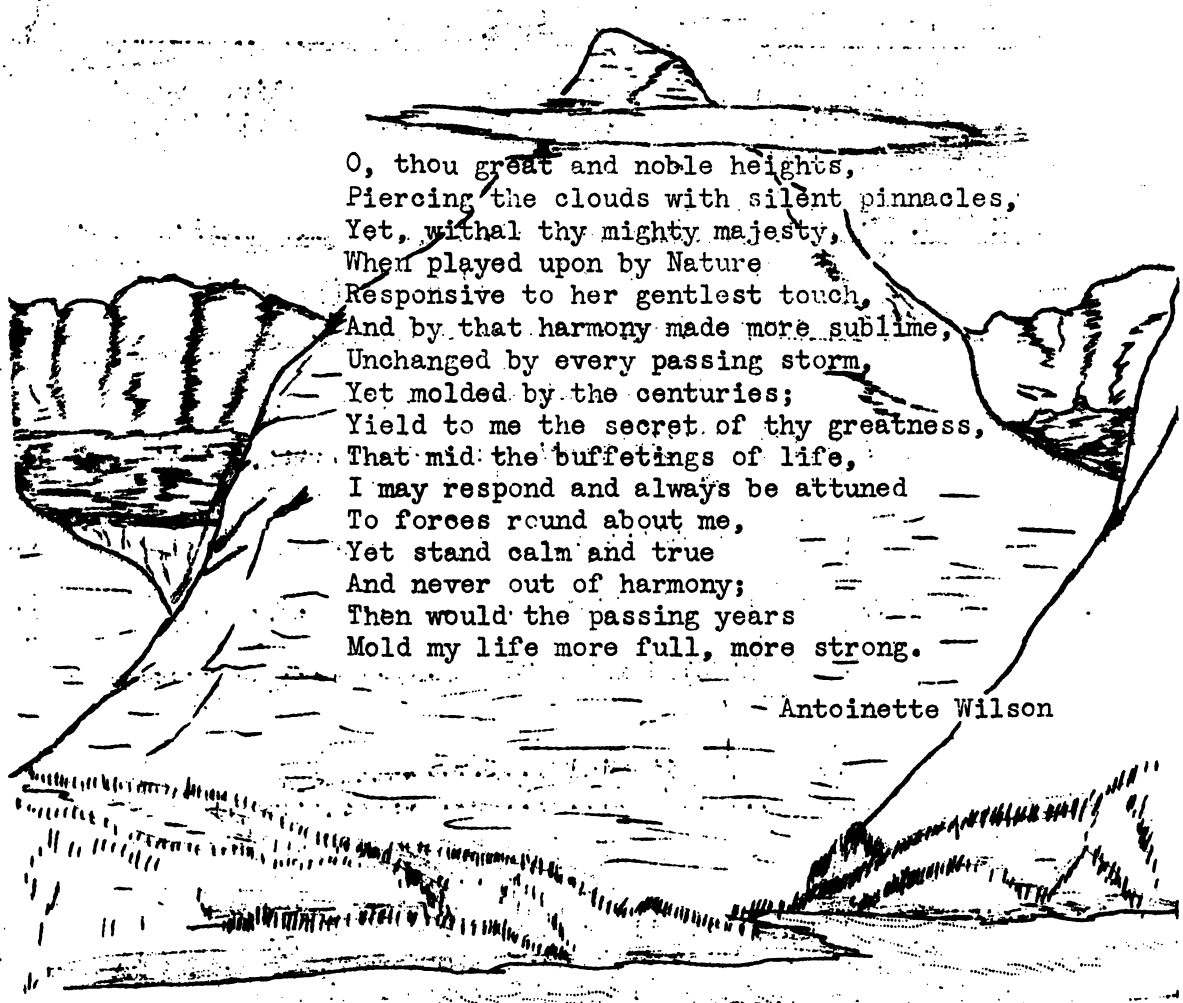

O, thou great and noble heights,
Piercing the clouds with silent pinnacles,
Yet, withal thy mighty majesty,
When played upon by Nature
Responsive to her gentlest touch,
And by that harmony made more sublime,
Unchanged by every passing storm,
Yet molded by the centuries;
Yield to me the secret of thy greatness,
That mid the buffetings of life,
I may respond and always be attuned
To forces round about me,
Yet stand calm and true
And never out of harmony;
Then would the passing years
Mold my life more full, more strong.

– Antoinette Wilson

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THE WINGS OF DEATH

Chas. L. Croghan, Park Ranger

In the study of Nature, we accept the beautiful with the ugly, and know there must be reason for it all.

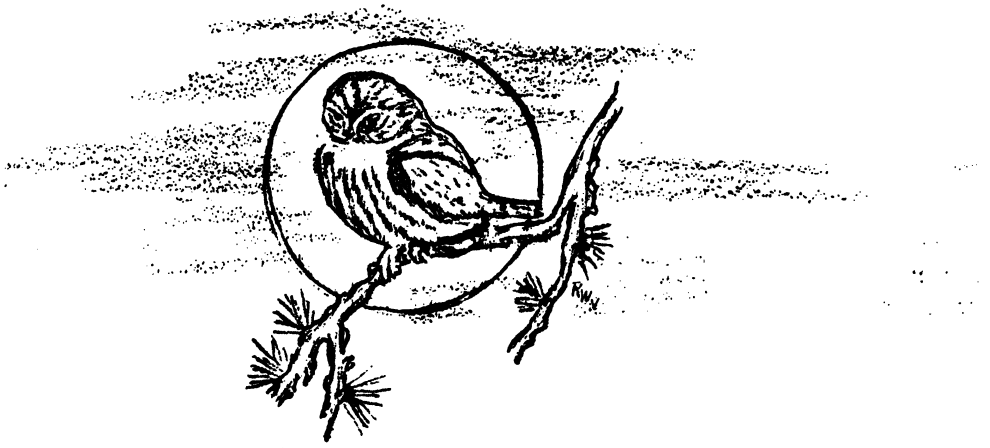
It was on a somber, cloudy day of early springtime, somewhere in the deep forest of the upper basin of Anaconda Creek. A sudden commotion in a flock of chickadees and nuthatches attracted my attention, and as I watched, a slightly larger bird swooped silently like Winged Death to seize a struggling victim. The chickadees cried "Cheet! Cheet!" the nuthatches, "Shame! Shame!" as it indifferently proceeded to strip away feathers and dine upon the body of the luckless chickadee.

Such is the foraging modus operandi of Glaucidium gnoma* or Pygmy Owl. This interesting little owl inhabits wooded districts of the Rocky Mountains and westward from British Columbia to Mexico. Its four white eggs are placed in holes excavated in trees mostly by woodpeckers. Its food consists of insects, rodents and reptiles as well as small birds. When full grown, it is only slightly larger than an English sparrow and of nearly the same color.

Later on the same day, another commotion came to my attention. This was caused by another of the same breed, the Western Goshawk or Grouse Hawk, as it rose from the ground and sailed over the treetops to an adjacent swampy pond; A succession of loud, distressed squawks faded into significant silence. A short search revealed the body of a Ruffed Grouse still filled with life's warmth. The assailant, too, was seen soaring, empty-taloned, over the calm water.

A few moments of lull - a pair of mallards slipped quietly from the side of a tussock into the open water. The sky and tree-tops appearing free from the flying foe, they dived and frolicked just as ducks like to do.

*Glaucidium from the Greek, γλαυκίδιον glaukidion, diminutive of γλαύξ, glaux, an owl. Gnoma, Latin for gnome, elfin spirit of the underground.



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NOTES ON MIGRATORY BIRDS

G. C. Ruhle, Park Naturalist

The following data on the movements of migratory birds was gleaned from the monthly reports of rangers and from other sources: Robins were observed at North Fork Ranger Station on February 25, at Lake McDonald Station, March 10; at Nyack, March 16; at St. Mary, March 17; at Sherburne Lake, April 2; at Belly River, April 9; at Cut Bank, April 12. Bluebirds, reported at Headquarters on February 16, were seen at Nyack, March 16; at St. Mary, March 17; at North Fork, March 20; at Lake McDonald Station, March 21; at Lubec, March 25; at Sherburne Lake, April 1; at Cut Bank, April 4; at Belly River, April 12. Varied thrushes, reported at Headquarters on February 8, were seen at Lake McDonald Station on March 4; at Nyack on March 18; at Paola on March 19. Geese were seen at St. Mary on March 12; at Lake McDonald Station, March 16; at Belly River, March 17; at Paola, March 20; at Two Medicine, March 23; at Lubec, March 25. Swans were seen on St. Mary Lake by Ranger Fleutsch on March 12; on Lake McDonald by Superintendent Scoyen on April 1. Redwings were reported by Ranger Fauley at Two Medicine on March 18; meadow larks by Ranger Fleutsch at St. Mary on March 17; redpolls (winter visitants) by Ranger Asker at Sherburne Lake on March 24; wrens (probably western winter wrens) by Ranger Howell at North Fork Station on March 14. In addition to these, the park naturalist noted the following: a whistling swan floated serenely in a back-eddy of McDonald Creek above the mouth of Avalanche Creek on May 7; a Lewis woodpecker hammered expectantly on a dead snag near the Two Medicine Road on May 12; a flicker flashed red as he flew past at Belton Headquarters on February 16; horned larks flushed suddenly as my car sped over the Blackfeet Highway on February 28; of the sparrow family, pine siskins were plentiful at Belton on April 1, vesper sparrows flitted on the Great Plains on May 12, chipping sparrows sang their buzzy ditties at Belton on May 5; the per-tit of a Louisiana tanager was noted on May 19; of smaller birds foraging in the crown foliage of conifers at Headquarters, the incessantly singing ruby-crowned kinglet returned on April 18, Townsend warblers on May 4, Audubon and Magillivray warblers on May 5, yellow warblers on May 18; a western winter wren was heard singing in the deep forest near Lake McDonald Hotel on May 14; on May 20 the twilight of Avalanche Gorge above the Camp Grounds was hallowed by the tinkling whisper of the first hermit thrush.

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HELP!! HELP!!

The mailing list of GLACIAL DRIFT has reached the limit of our facilities. A waiting list with more than a hundred names has been established. If you are not saving your copies of this pamphlet, nor passing them on to other readers, mail them back to the Educational Division and we, in turn, will pass them on to these patient waiters.

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MOUNTAIN CLIMBING IN GLACIER
PART III

Morton J. Elrod

Mt. Cleveland has been scaled several times: Its elevation, 10,438 feet, is 6,000 feet more than that of Waterton Lake, which is immediately north of the towering mountains and stupendous cliffs. I prepared twice to make the ascent, but was in each case deterred by bad weather. The start is made from Reynolds Creek on the west, from the place in the trail where remains of log cabins of a former logging camp still stand. Here, also, is the abandoned cabin in which the aged ranger Reynolds, who delighted in the nom-de-plum "Death on the Trail", spent his declining years. Within a half hour from the start the timber and brush is passed, and the open face of the mountain encountered.

The mountain has been climbed in a single day, but it has been a very long day, filled every minute with strenuous muscular and heart effort. There is no trail nor path. The way must be sought from mountain experience. There is no published route to follow, no guides to employ, and no one to ask about the way. This great mountain mass, perhaps the most dominating feature of the Park, has a number of extending ridges connecting with unnamed peaks. The main summit, viewed from almost every other Park summit, seems to dare courageous mountaineers as they pass by on the trail. Only a limited few, but including both men and women, haven taken the dare, left the parties with which they were traveling, and made the attempt to reach the summit. So far as I can discover, all attained the goal, although some have been compelled to stay on the mountain overnight. It must be remembered that an unknown and trailless mountain can not be traveled after darkness comes.

Some day, when there are living accommodations nearby, the mountain surely will become a Mecca for mountaineers. A route will be mapped to the summit, which will be one of the feature trips of the Park. But it seems a nobler mountain because of the few attempts made to reach its summit, and because of its present isolation. The entire Cleveland region is practically unexplored.

Most of the ascents of the Park at this writing are of mountains in the Lewis Range, the eastern of the two parallel ranges extending through the Park. The western or Clark Range has a large number of beautiful mountains, with sharp summits, glaciated walls, high waterfalls, turquoise or emerald lakes, great beds of delicate spring and summer flowers, and bands of wild game animals, but this range is at present not within the general scope of most of the Park travel, because of the absence of trails and hotel facilities. But these will come into their own in due time. Park travel will increase, each year will see new trails to hitherto inaccessible places. Then the names, Longfellow, Trapper, Geduhn, Anaconda, Mantla, Guardhouse, Kinnerly, and others will be as common and visited as often as those in the Lewis Range.

Heavens Peak is by far the most conspicuous and best known mountain

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in the Clark range at the present time. From Granite Park it presents a most stunning and fascinating appearance. It is the subject of comment of every tourist visiting the chalet, and it is doubtful if a single camera carried to this beautiful spot has failed to record a picture of this magnificent ice smoothed summit, on whose crest eternal snow rests, and down whose slopes tremendous avalanches slide until late summer. From the transmountain road it is in view for the last twelve or fifteen miles as the road is now constructed. From one of the windows of the tunnel it appears as a wonderful etching, by a hand more skillful than that of any human being, framed by the rock of the eternal hills, an object of which the eye never tires. At the turn in the road it is even more beautiful and majestic. Its snow capped peak seems to invite the traveler to closer inspection. Rising 5,850 feet above nearby Lake McDonald and nearly 9,000 feet above the sea, its summit has been pressed by the feet of few human beings.

R. H. Chapman, deceased, while doing the preliminary work of triangulation, was probably the first to reach its highest point. He erected a triangulation monument, from which angles to other peaks were taken for the survey of the region. He made more than one ascent of the mountain for this purpose.

The mountain does not often taunt in vain. During the past summer two young Englishmen spent two or three weeks at Granite Park, scaling the nearby mountains. They had alpine equipment, and best of all, endurance and experience. Looking over McDonald Creek, the mountain summit was a few miles away in air line. However, the way was a descent of more than a half mile vertically to the creek valley, for which there was a good trail, then three fourths of a mile vertically, and, laterally, miles of brush, rocks, and down timber.

These young men took one look, and made ready for the start. For two days they scrambled, over the trailless mountain, in making the ascent and the return. Three thousand feet of brush, head high, forming an almost solid mat, was the greatest obstacle. The last slope to the summit presented a grand panorama, in every direction, showing every mountain of importance in the Park, and hundreds outside Park boundaries.

It was a lark. They thought nothing of it. Other ascents were planned immediately on their return. It required some quizzing to induce them to talk about it. Yes, it was abundantly worth the effort. But the majority of Granite Park visitors would say no.

Some day Heaven's Peak will come into its own, and a footpath will be made to the main ridge, from which to the summit none is necessary. One thinks unconsciously of Heaven while looking at the mountain. Perhaps one still reflects on reaching the summit, and still looks upwards. It is ever thus with man, and it is well this is so. Did man not have a desire to do, to know, and to conquer, our boasted civilization would never have developed.

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EDITORIAL PAGE

A CURSE

When God made America, He clothed forest and prairie, plain and valley, plateau and mountain, the river banks, bluffs and headlands with a lavish abundance of wild flowers. In springtime, the landscape, wooed by warm sunlight and caressed by gentle showers, grew emerald, soon flushed with plant color, soon shone with living light. Unspoiled, it was one continuous flower garden streaming with redolent fragrance, in which game animals wandered contentedly, in which hummingbirds and bees sipped sweet nectar from the chalices of brilliant bloom. It was a beauty natural to a soil unsullied by plow or shovel, by ruthless lumbering or grazing interests, by commercial exploitation or wanton depredation of so-called flower lovers.

Now agriculture, lumber and factories are necessary for the welfare of crowded, populous areas; it was inevitable that the wild bloom should suffer from these factors. Worse than these, however, and wholly unnecessary has been the unbridled rape of the floral beauty of woodland and roadside by a commercial traffic in wild flowers and by misguided folk who carry off whole automobile loads of flowering branches and who dig or tear up uncounted numbers of plants that soon perish from neglect or from transplanting under unfavorable conditions.

Commercial gathering and selling of wild plants has hurried towards extinction some of our most beautiful flowers: the trailing arbutus in New England, the Mission Bell in California, the gentian, the moccasin flower and other wild orchids. Seeing on the flower mart the faces of helpless innocents already far on the road to extermination should appall like traffic of human souls. They, too, are piteous sacrifice to the Idol, Greed.

Every Sunday, thousands of motorists repair to the country to slash heedlessly and pick promiscuously large quantities of flowers that are generally soon cast away. These Vandals destroy wild flowers and flowering trees, and leave litter and debris in their wake. Much is due to careless ignorance; much, by failure to recognize that the automobile has enhanced dangers of natural beauty, and that practices, comparatively harmless individually, become irreparably damaging collectively.

These are a curse of our country. And what is to be done to remove us from its thrall? Many states are passing laws prohibiting the gathering of flowers along highways, the picking of certain species in danger of extinction, and the selling of wild plants the existence of which is threatened. Some states are establishing parks and preserves that serve as sanctuaries in which each plant may thrive under native conditions. More important than legislation are educational programs similar to those in our National Parks that teach the public to know the plants and man's fitting conduct towards them. Most important of all is the cultivation of a genuine, unselfish love for the beautiful, a love that makes unnecessary the creation of statutes for protection and which, coupled with knowledge and understanding leads to immeasurable blessing and joy.

(Concluded on page 38)

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TILL

Early Flowers - Trilliums started blooming about Headquarters on April 13. Buttercups were abloom at Two Medicine on April 8; carpet pinks followed on the 16. Pasque flowers were blooming around St. Mary and Babb on May 1. The first bear grass started flowering at Belton on May 27.

Breaking Hibernation - Bears were reported out of hibernation by rangers at various stations as follows: March 24, Waterton Lake; April 4, Nyack; April 11, Lake McDonald; April 17, Sherburne Lake; April 24, St. Mary and Belly River; April 26, Cut Bank; April 28, Paola (in the National Forest across the Middle Fork from the Park) and Kishenehn (this latter, a grizzly with two cubs); April 30, Two Medicine. Chipmunks were seen at North Fork Ranger Station on March 16, at Paola on April 10. Columbian ground-squirrels were seen at Nyack on April 2, at Paola on April 25. Richardson ground squirrels, reported above ground on warm days throughout February, were seen by the park naturalist disporting in the warm sunshine along Blackfeet Highway on February 28.

Eighty-two Sheep - The snow storm of late March brought eighty-two mountain sheep to the feed-lot at Many Glacier.
- T. E. Whitcraft, Assistant Chief Ranger

Trout Food - Streams at Two-Medicine teem with caddis-fly and mayfly larvae, the principal food of Glacier's trout. Copepods, water boatmen and other choice food is much more abundant than in normal years. Fresh water shrimp, scuds, are absent from Two Medicine Lakes. Larvae of helgramnites, Corydalis, are plentiful in Paradise Creek, in which there are no trout. - C. C. Fauley, Park Ranger

Wood Frogs - Wood frogs commenced spawning at Two Medicine on April 25. In the slough behind the checking station, their globular egg masses appear to foreshadow the coming of unbelievable numbers of tadpoles, but their enemies, such as the aquatic snakes, harmless to man, will prey upon them with merciless persistence. - C. C. Fauley, Park Ranger

Right under the Nose - Two American mergansers paddled about contentedly in an eddy of the North Fork of the Flathead. Soon they were joined by a pair of mallards. A short distance upstream, a bald eagle perched high in a cottonwood that overleaned the river. Disturbed, these two pairs of different ducks, of different flavor, flew directly under the nose of this formidable enemy: the very idea! - Chas. L. Croghan, Park Ranger

Which Raises the Question - Do eagles eat ducks? Not a particularly energetic bird, the bald eagle does not molest quicker birds, though wounded individuals are quickly picked up. Taverner, in his "Birds of Western Canada", states: "Once on the wing, such birds (ducks) are comparatively immune from attack, for the Bald Eagle rarely, if ever, attacks on the wing, but, if surprised on the water and cut off from the air, the fate of birds even as large and hardy as Geese and Loons is practically sealed."

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Chickadee Mother - On the morning of March 25, a chickadee darted from the feed-rack right across my face as I stepped off the back porch. I thought little of it until it returned to the rack and darted right back. Then I noticed that it was pulling off bits of suet which were carried to another bird perched on the clothesline. This latter, rather tattered-looking individual would swing under the line and open its mouth to be fed. It was a young chestnut-backed chickadee, nearly as large as the mothering bird. On several other occasions, I have noticed an adult chickadee tear off suet morsels which were carried to adjacent trees to two other waiting chickadees. At first I suspected these two as being "Hi-jackers" of chickadee-land, but I now believe they must have been chickadee young.

- Mrs. R. W. Vincent

A Note on Osprey Behavior - Three ospreys were seen wheeling and playing several hundred feet above the peaks surrounding Red Gap. They would ascend vertically, fold their wings close to their bodies and drop like plummets for a hundred feet or more, only to regain control with a magnificent soar. For fifteen or twenty minutes the show continued, until the birds disappeared around the shoulder of an adjacent high peak. No apparent purpose save the sheer sport could be ascertained for their playing. The magnificent flight and the glorious surroundings for their caricoling, thousands of feet above nearest fishing streams awakened new admiration for their freedom of spirit. - Ralph C. Teall

Returning Ospreys - On a trip up Ole Creek on May 4, I saw two ospreys that had returned from the southland to renovate their home of the previous summer, a shambling pile of sticks perched on top of a dead snag. On the 24th, from an adjacent cliff, I could see the newly hatched young moving about in the nest. - George N. Paige, Fire Chief

Maniac Jargon - Two ruffled grouse that have used some brush and spruce behind my ranger station (Logging) for headquarters all winter, have thus far escaped the depredations of a pair of Western Horned Owls, their neighbors, though such has not been the good fortune of a friendly snowshoe rabbit that had his home among the bales of alfalfa hay in the barn. He fell victim to the owls in mid-January. Evenings, these great owls intersperse mournful whoo-whoos with a kind of maniac jargon. It may sound enticing enough to owls' ears, but has a decidedly opposite effect on mine. - Chas. L. Croghan, Park Ranger

Square Woodpecker Holes - Last summer, I was repeatedly asked about square excavations that occur generally near the base of dead trees or snags. The largest of our woodpeckers, the northern pileated, is not to be satisfied with the smaller insects that infest bark and sapwood and that serve the palates of smaller birds; he is inclined to dig deeper for larger, more luscious morsels, generally the larvae of the ponderosa pine-borer, Ergates spiculatus, large brown beetles that are often seen flying about electric lights in summertime, whose larva is often two and one-half

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to three inches long. All woodpeckers, except the pileated, dig round holes. The pileated excavates with mighty strokes both square and round.
- Chas. L. Croghan, Park Ranger

Crippled Crossbill - Ranger Ness reported picking up a crippled crossbill near the fence in front of his Cutbank station. Apparently the bird in flight had collided with the fence. It survived but a brief while.

Refuge from Storm - The night of March 26 was marked by a severe blizzard in strong contrast with the agreeable weather of earlier March. Early on the morning of the 27th, the park naturalist found varied thrushes seeking refuge from the bitterness of the elements in crevices under rocks along the banks of the Flathead River.

Nesting Thrushes - Varied thrushes generally nest in small trees and bushes but a pair this spring nested under the naturalist's house. The four young left the nest on May 8, at 11 A.M.

Excited Robin - One morning a robin in the grass outside my window showed considerable excitement over something. He would peck at the ground, jump back, ruffle his feathers and scold. Interested, I perceived the object of his discomposure to appear like a big worm. Closer investigation showed it to be a six-inch garter snake, which soon was sufficiently croppled to be carried off in the bird's mouth as it flew away.
Mrs. E. J. Cruger

Comments on Birds - "I notice in GLACIAL DRIFT (Vol. IV, 27) the comments on earliest spring records of Western Bluebirds in Montana. A pair arrived in Missoula on March 15 and are nesting in the bird house in an apple tree in our yard. We saw pipits, white-crowned sparrows, fox sparrows and leucostictes on top of Logan Pass (May 30), Townsend solitaires on the Transmountain Highway, and several pileolated warblers at Avalanche Lake."
- Mrs. K. D. Swan, Missoula

Comments on March Weather - On March 21, a lightning storm very unusual for the time of year, occurred in the Lake McDonald District. Ranger Hugh Buchanan reported a strike on Stanton Mountain, two on Mt. Brown. March 26 was the coldest day of the past winter. Eighteen below was recorded at Cut Bank Ranger Station. Waterton Lake, open all winter, finally froze on that night.

Editorial, "A Curse", Continued from page 35 - Glacier National Park prohibits the senseless destruction of her floral treasures by ruthless picking. It entreats that you be not a human locust. It aspires to instill such love for Nature that you freely say, "Even tho you had no regulations restricting the taking of flowers, we should not pick them, for the Creator has given them for all to see and take pleasure." God has made the flowers to spread their miraculous beauty for the enjoyment and exaltation of every one. A flower in the vase is not nearly as attractive as the same flower in the field, in the spot where His hand has placed it. A picked flower cannot produce seed to prepare for the renewal of beauty in succeeding time. For the sake of America and the Future

DO NOT DESTROY THE WILD FLOWERS

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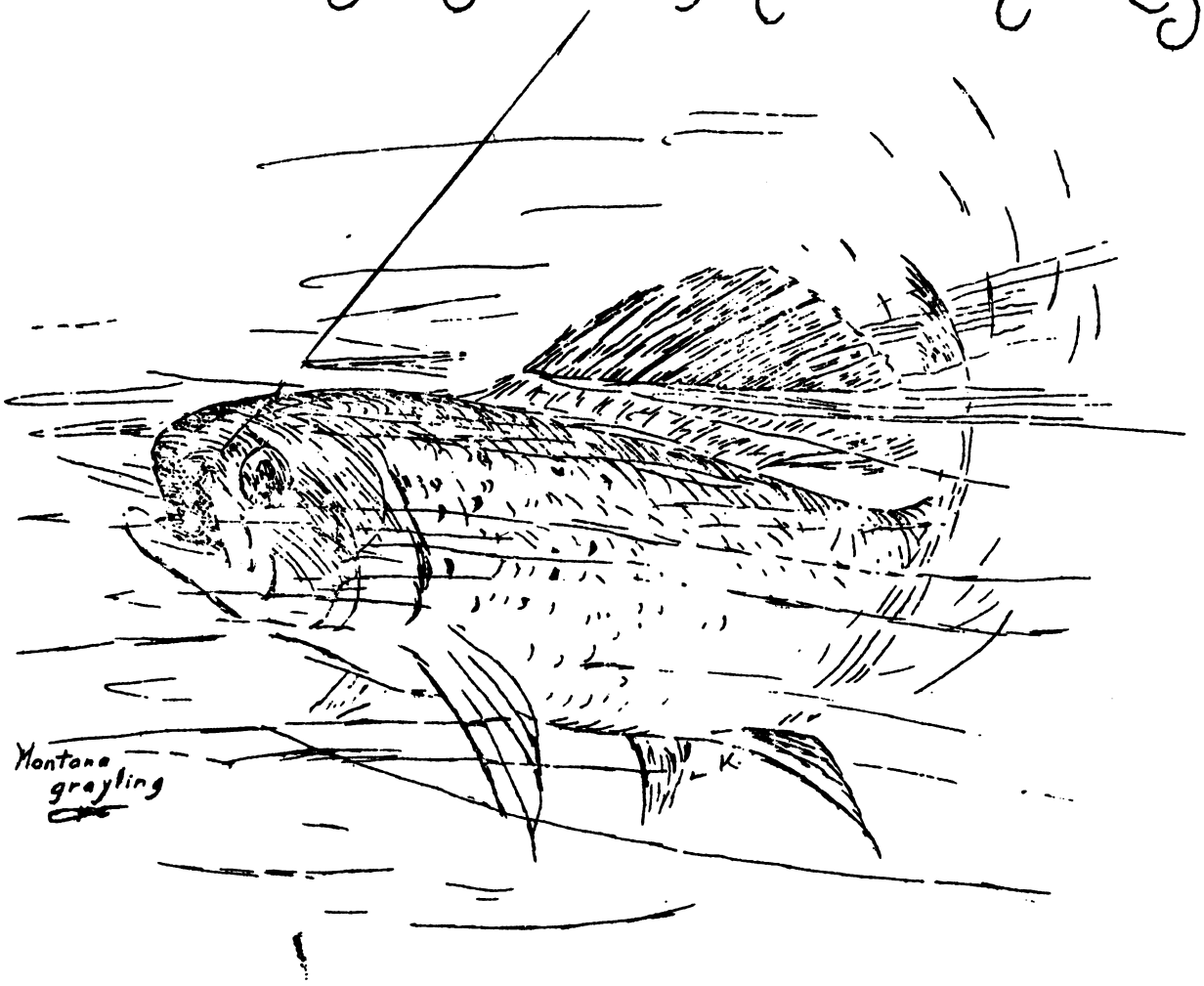
GLACIAL DRIFT

NOTES FROM GLACIER NATIONAL PARK



JULY 1931

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UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
GLACIER NATIONAL PARK

GLACIAL DRIFT

Volume IV July, 1931 Number 7

A monthly pamphlet edited by the park naturalist and distributed by the Educational Division of Glacier National Park to all interested in the Park and its natural history.

Eivind T. Scoyen, Park Superintendent Dr. G. C. Ruhle, Editor

"STUDY NATURE: NOT BOOKS." (Agassiz)

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"For tourists who want to escape completely from nerve-wracking city life, Glacier Park is one of the few real back-to-nature regions remaining unspoiled. Let us hope it is as civilized as it will get. Glacier's great lure is that the world-weary traveler may plunge into vast forests, ride horseback over thrilling alpine trails, hike and scale mountains, fish in scores of lakes and streams, explore glaciers, see wild animal and plant life in primitive state. It will always be the nation's great wilderness park."

- Dr. H. C. Bryant, Assistant Director of the National Park Service

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THE MONTANA GRAYLING

G. C. Ruhle, Park Naturalist

"That most wonderful of American inland game fishes, the Montana grayling," is the superlative of phraseology used by grayling enthusiasts, by no means an insignificant portion of fisherman numbers. Nor is it at all surprising that such terms be invoked in speaking of this most graceful and shapely creature of exquisite coloration and alluring gameness, that not only takes an artificial fly eagerly, but also strikes repeatedly upon missing, and breaks water in rapid repetition when hooked. So it is with growing uneasiness that scientist and sportsman views the disappearance of this handsome gamester from many of its native haunts.

When Lewis and Clark recorded their celebrated expedition, they described grayling taken from the Jefferson Fork of the Missouri River. For many years, this fish was suspected by some ichthyologists as being a cross between cutthroat and whitefish, though it is now known to belong to a distinct family, of which three species are native to North American waters. Named in accordance with their indigenous haunts, these are the Montana, Alaska, and Michigan grayling. Although related to trout (Salmonidae) in habits and general appearance, grayling (Thymallidae) differ in the character of skeleton and in the plumose dorsal fin.

The Montana grayling was naturally found only in the headwaters of the Missouri River. Its range has been extended by pisciculture. The Alaska grayling is found only in streams flowing into the Arctic. The Michigan grayling once existed in great abundance over the whole Southern Michigan Peninsula, but have almost entirely disappeared, probably through the introduction of rainbow and brook trout. Artificial propagation in Michigan has repeatedly met with failure.

The lithe Montana grayling (Thymallus montanus) is of general gray coloration with a reflection of purplish iridescence. The head is silvery, the belly is pure white. Black V-shaped marks blotch the sides anteriorly. The rose-bordered, richly variegated dorsal fin is long, tall, wavy. The gray anal and pectoral fins are dark-bordered. As food, the firm, white, flaky flesh is of delicate flavor, better than that of trout.

Grayling are quite gregarious. They prefer clear, cool streams and lakes with sandy or gravelly bottoms on which they lie in plain sight or feed on insect larvae and worms. In spring they travel long distances, fighting onward to the headwaters, surmounting barriers that would turn back the staunchest trout. Then, in some rather sluggish stream, the female lays three thousand eggs per pound of her weight. In three days, small gilt specks appear in these which will some day develop into eyes. At 50° F., the eggs hatch in about two weeks. By careful fish hatchery methods, about fifty per cent of the eggs are productive of fry. Eyed grayling eggs are readily transportable.

Of the four and one half million grayling planted in most every region of Glacier National Park, only a small portion has proved worth while. The successful planting in Swiftcurrent Ridge Lake (Moran's Bath-

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tub), Kennedy Lakes and Creek has been outstanding. All of these are in Hudson Bay drainage.

Two dates are important in the story of the small body of water astride Swiftcurrent Ridge at the eastern base of Appekunny Mountain. This oval body of clear cold water that has no inlet nor outlet above ground, is best known locally as Moran's Bathtub. The story is told of the rotund jovial wrangler whom a passing party discovered laving himself in the cold water. The name given by them has persisted despite the change by the National Geographic Board in 1929 to the more dignified Swiftcurrent Ridge Lake.

In 1921, Chief Ranger Brooks was packing a plant of grayling fry to the Kennedy Creek Area. On nearing the summit of Swiftcurrent Ridge, the young fishes were showing signs of distress. Not wanting to lose the whole lot, Mr, Brooks decided to dump them in Moran's Bathtub. 40,000 were thus planted. These did so well that 20,000 more were added in 1925, and 317,500 have been planted to date. These have thrived, so that no body of water in the Park is more famous for grayling fishing.

A TREE BIOGRAPHY

Dr. William G. Vinal, Ranger Naturalist

A large Douglas Fir standing by the trail which leads west from Going-to-the-Sun Chalet was recently broken off by a wind storm about eight feet from the ground. As many hikers and horseback riders pass that way it was considered a good place to translate the autobiography of the tree so that all who passed might have the opportunity to read wood-script as the old tree itself had written it.

To open the leaves of the book, as it were, the standing trunk was sawed cross-wise, about four feet up, and only to the center. About a foot above the sawed surface the wood was cut out to the cross section with an axe. This left a notch with an over-hanging roof, which would help to protect the labels from the rain.

The next step was to "scout around" and find "signs" and then interpret them. As each marking was "read", a label was typewritten and pinned to that particular spot. This is the way they were worded:

Dr. Woodpecker is a friend of trees. This is where the pileated woodpecker, the cock-of-the-woods, performed a successful operation.

The timber ant is an enemy of trees. The woodpecker ate the timber ants that bored here, and here.

Bark is often to be found on the inside of a tree.

This embedded limb started years ago. It is the cause of knots in lumber.

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Lightning let in this fungus growth which caused the tree to decay and finally to succumb to the gale.

Follow this string and see the white fungus that was the primary cause for the down fall of this giant.

Another kind of fungus which also is a sign of bad health and decay has the scientific name of Fomes.

This is a point of infection which the old tree tried to heal.

Note that the resin comes from the sap wood.

Resin is secreted by the tree for protection.

And now for the age markings. What person does not enjoy guessing the age of a house, or a horse, or a dress, or a fellow companion? Often times it is a great deal better than a guess. When it comes to a tree the age may be computed exactly. (This does not mean that the other objects mentioned cannot be given accurate figures). To start the observer off on the right basis a sign with the following information was pinned to a place that gave the data most clearly: "This dark wood grew in spring, the light wood in summer. These two growths make an annual ring." Another paper volunteered the information that - "These pins show ten-year growth periods."

Three blue cards, larger and more conspicuous, were then written and nailed to the stump. The card facing the trail contained the following information:

"THE DOUGLAS FIR IS THE SECOND LARGEST TREE, THE SEQUOIA BEING FIRST. The biography of this tree has been deciphered by a Ranger Naturalist. If you are interested in knowing more about the Outdoors, why not join one of the trips afield? They start in the lobby of the Chalet at 12:50 P.M. every day except Sunday. This service is furnished free by the United States government. LEARN ABOUT THE WONDERS OF YOUR GLACIER NATIONAL PARK."

The card facing toward the chalet, or to be seen first by outgoing parties, gave this information:

"THIS OLD DOUGLAS FIR
was born in 1699
was struck by lightning about 1903
has been infected with timber ants for the last forty years
grew as much from 1881 to 1883 as it did from 1920 to 1930
grew to be slightly over 100 feet tall
was blown down this summer in a wind storm

The card on the in-coming side was more of a chronological nature.

"THE OLDEST LIVING SETTLER HEREABOUTS up till the time that it was blown down this summer.
106 years old when Lewis and Clark came
154 years old when Governor Stevens surveyed and explored this Washington Territory
In 1855, could have seen the Blackfeet returning from their treaty
Was an old tree when the Great Northern was constructed in 1891
Had twenty years to live after President Taft signed the bill making this Glacier National Park
IT IS NOT TOO LATE FOR THIS OLD TREE TO TEACH SOMETHING."

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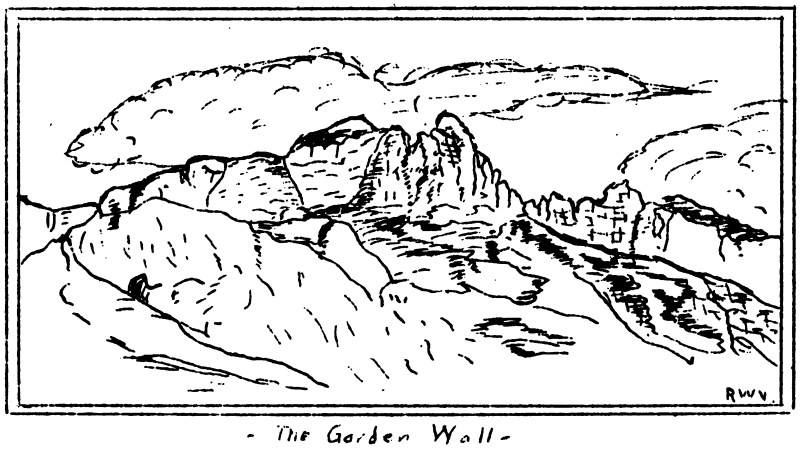
And what shall we say of the results? The hour and a half that I have been sitting here in the shade of Alpine Firs and Lodgepole Pines, to say nothing of the brothers of the veteran, there have been many passer-bys. Two deer came within 30 feet, peering and laying their ears forward, as though a typewriter were a most unusual contraption. A guide with a party on horse back volunteered the information that he had always thought it to be a sound tree. Hikers went by at intervals of 15 or 20 minutes until seven such groups had passed. Each time they stopped and the stump furnished the starting point of conversation. All had studied the labels before which shows that such schemes for self-instruction do not go amiss.

Remarks also come to my ear when I am not sitting in a portable chair at its base. One man counted 90 rings and tood me to task. Upon investigation, I found that he had counted them on one of the logs that had been cut off and rolled down the bank. He readily understood when I explained that annual rings are added much like putting a glove on one's finger and that it took a few years for the tree to get 50 feet up into the air. To get the true age of a tree the cross-section must be made near the base.

Only yesterday a lady hurried ahead of my party saying that she wanted to learn about that Douglas Fir. And just now two ladies, who went by earlier in the morning, stopped to ask about the sun-cracks that they saw in a slab of gray shale. As they smilingly departed they suggested that I extend my "Fresh-air Museum" to include the sun cracks as so many would be interested. Yes, the Tree Biography has already paid good dividends by way of instruction, as a social center, and as a provoker of thought. May its king be multiplied, for every woody path must have an old stump waiting to be interpreted to lovers of the trail.



- The Garden Wall -

The original of the COVER DESIGN for this month was drawn by Ranger Naturalist Eugene Kingman (see page 45).

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TWO POEMS

Again Glacier National Park is confronted with a season fraught with dangers of Forest Fires. Ranger Arthur Best submitted copies of two timely poems which he has preserved among other clippings. The editor has not been able to discover their authors.

A RANGER'S PRAYER

God, help the folks who walk these trails
Be mindful as they go.
That there shall be no embers left
To tempt the winds that blow;
Nor let them leave old tins about
Their camp, nor bits of glass,
For forest fires start with these
Half hidden in dry grass.

This stream that runs its pebbled way
God, let them leave it sweet
And pure as when they found it first
Hidden from summer's heat.
And do not let them cut the trees
That stand in majesty;
Nor let them trample ferns; nor break
The branch of any tree.

God, keep my vision true and clear
Thru all this bluish haze,
That hangs like velvet everywhere
Thru these long summer days;
Nor let me see one wisp of smoke
Curl up where forests dwell;
But if I do, God give me strength
To do my duty well.

* * * * * *

BEWARE!

Old Satan smiled a devilish smile,
and waved a long forked tail
As he viewed the new arrival in
his somewhat torrid vale;
He rubbed his sharp-clawed hands
in glee; he breathed dense
clouds of smoke,
His eyes glowed like two red-hot
coals, and thus grim Satan spoke:

"Oh ho! my merry firemen all!
Come quickly, see who's here!
The very chap we've waited for
Since August of last year.
We've saved for him the hottest
place, the tall asbestos trees;
Go stoke the fires, and heat 'er to
six-hundred ten degrees.

"And throw him in and chain him -
Don't let the fires get low -
And turn the big blast furnace
loose where he can feel it blow.
He'll get what he gave others:
Real hell, beyond a doubt!
For he's the man who did'nt put
His own camp fire out."

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GLACIAL DRIFT

THE RANGER NATURALIST SERVICE

The Educational Divisions of the different National Parks are developed independently according to the individuality of the respective park naturalists. In Glacier National Park, the trip afield with a competent naturalist guide, which is direct contact with nature itself, is the predominant aim. Lectures, exhibits, and other departmental features all have as their focal object getting park guests to go out with a ranger naturalist to see and hear for themselves the wonders of God's handiwork. The park naturalist was happy to find that during the week ending July 8 over one thousand guests, 20% of the 1930 season's total, had been on field trips conducted by the naturalists.

To obtain these results, the best staff of naturalists ever assembled in Glacier was directly responsible. From the 1930 staff Dr. J. V. Harvey, M. B. Nichols and Willard T. McLaughlin have returned. The last named has just received his Ph. D. in botany from the University of Wisconsin. E. Flottman came to serve in Glacier from the Yellowstone naturalist staff of the past few years. Harold E. Bailey, formerly of Sequoia National Park, is a mycologist at the University of California. Jack Hough studied geology under the great Harlan Bretz of the University of Chicago. W. Stephen Thomas hails from Harvard, Palisades Interstate Park and tropical naturalist expeditions. Marvin Wilson was a student at Cornell College under Howard Kelly, capable, well-loved naturalist at Lake Station of Yellowstone. Eugene Kingman of Yale is making some panoramic paintings for Glacier which will portray the marvelous geologic romance of her mountains. Last, but not least, "Cap'n Bill" Vinal, celebrated popular field naturalist of Western Reserve University will join the staff during August and September.

Great and popular has been the extension and improvement of the Service over that of last year. For the first time, a naturalist is stationed at Avalanche Creek Camp Grounds to conduct regular field trips and to deliver lectures there nightly. Auto caravans under the leadership of the naturalist travel to Logan Pass for a short field trip or a hike to Hidden Lake. Twice-weekly field trips and camp fire entertainments are conducted at Granite Park and Sperry Chalets. Daily all-day trips are conducted from Many Glacier. A naturalist accompanies saddle horse parties to Grinnell Glacier twice a week. Nor have any of the services given last year been neglected: the daily lectures at Many Glacier Hotel and Auto Camp, Sun Camp, Two Medicine Chalet and Lake McDonald Hotel; the local walks afield with a naturalist at various centers; the evening boat rides on St. Mary Lake and the afternoon trips to Twin Falls at Two Medicine.

People visiting Glacier National Park this year have available a very adequate personal naturalist service to which will be added some day a system of trailside museums or nature shrines that will round out into a complete whole this splendid gift of the National Park Service to every one who will avail themselves of it.

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TILL

Animal Life at Two Medicine - An otter was seen at the Camp Grounds in June. Beaver are being seen by fishermen who angle late. Rabbits, of interest to campers, are plentiful. Marmots have a colony near the head of the Middle Lake and may be observed along the South Shore Trail. Several mule deer show up at the Ranger Station. Elk are not plentiful along the trails since they have doubtless drifted to their summer range near the source of Park Creek and in Paradise Park. Bear, though rarely seen, are numerous in every tributary valley. Goats are observed on Appistoki Mountain and near the Upper Lake. Sheep, remaining in seclusion, are not frequently seen. Ducks abound in fair numbers and variety: harlequins on the Middle Lake, American mergansers and redheads on the river, mallards in the backwaters of the Lower Lake. - C. C. Fauley, Park Ranger

Frightened Deer - Two deer, frightened by an approaching automobile, jumped through the window of the Transmountain Highway tunnel. Though seen apparently dead by the driver of the car, only one carcass was found by the district ranger. The other deer, only stunned by its precipitous leap, had vanished.

Black Terns - Unreported in Glacier National Park, though common enough in nearby Flathead Valley, black terns have been seen rather frequently this year in and about the Park. The park naturalist saw his first black terns in the Park, skimming the waters of Lake McDonald on June 16.

Fish Planting - Fred J. Foster, district supervisor of the United States Bureau of Fisheries, has called Glacier one of the greatest fishing areas in America. In order that its excellent fishing continues to be a principal attraction, more than 1,750,000 trout, principally the native cutthroat, rainbow and eastern brook, will be planted in the lakes and streams this year

Landlock Salmon - Western sportsmen have something to celebrate in our plan to introduce into Glacier waters landlock salmon, considered the premier sporting fish by eastern sportsmen. Ten thousand will be brought this season from their native Maine to be planted in St. Mary Lake. More will be added each year until this scrappy fish is established in Park waters.
- Fred J. Foster, Supervisor, U. S. Bureau of Fisheries

Author Scoyen - Superintendent Scoyen is co-author with Frank J. Taylor of "Rainbow Trails," a Stanford University Press book relating the glory and lure of Bryce Canyon, Zion National Park and the North Rim of the Grand Canyon. Mr. Scoyen tells in a charming fashion the story of the Utah Parks of which he was Superintendent before coming to Glacier. The book is a splendid addition to the set on National Parks which includes Director Albright's "Oh Ranger," "The Grand Canyon Country" of Tillotson and Taylor, "The Big Trees" of Colonel White and Judge Fry. "Rainbow Canyons" has been selected as the scientific "book of the month".

Travel Figures - 30,823 people entered Glacier Park by July 25; a decrease of 10.4% below last year. - Superintendent E. T. Scoyen

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GLACIAL DRIFT

NOTES FROM GLACIER NATIONAL PARK

AUGUST 1931

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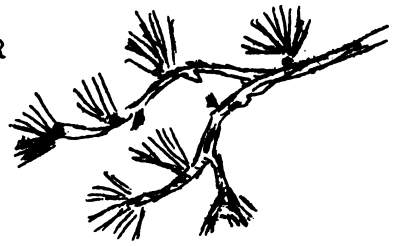

GLACIAL DRIFT

Volume IV August, 1931 Number 8

A monthly pamphlet edited by the Park Naturalist and distributed by the Educational Division of Glacier National Park to all interested in the Park and its natural history.

Eivind T. Scoyen, Park Superintendent Dr. G. C. Ruhle, Editor

"STUDY NATURE: NOT BOOKS." (Agassiz)

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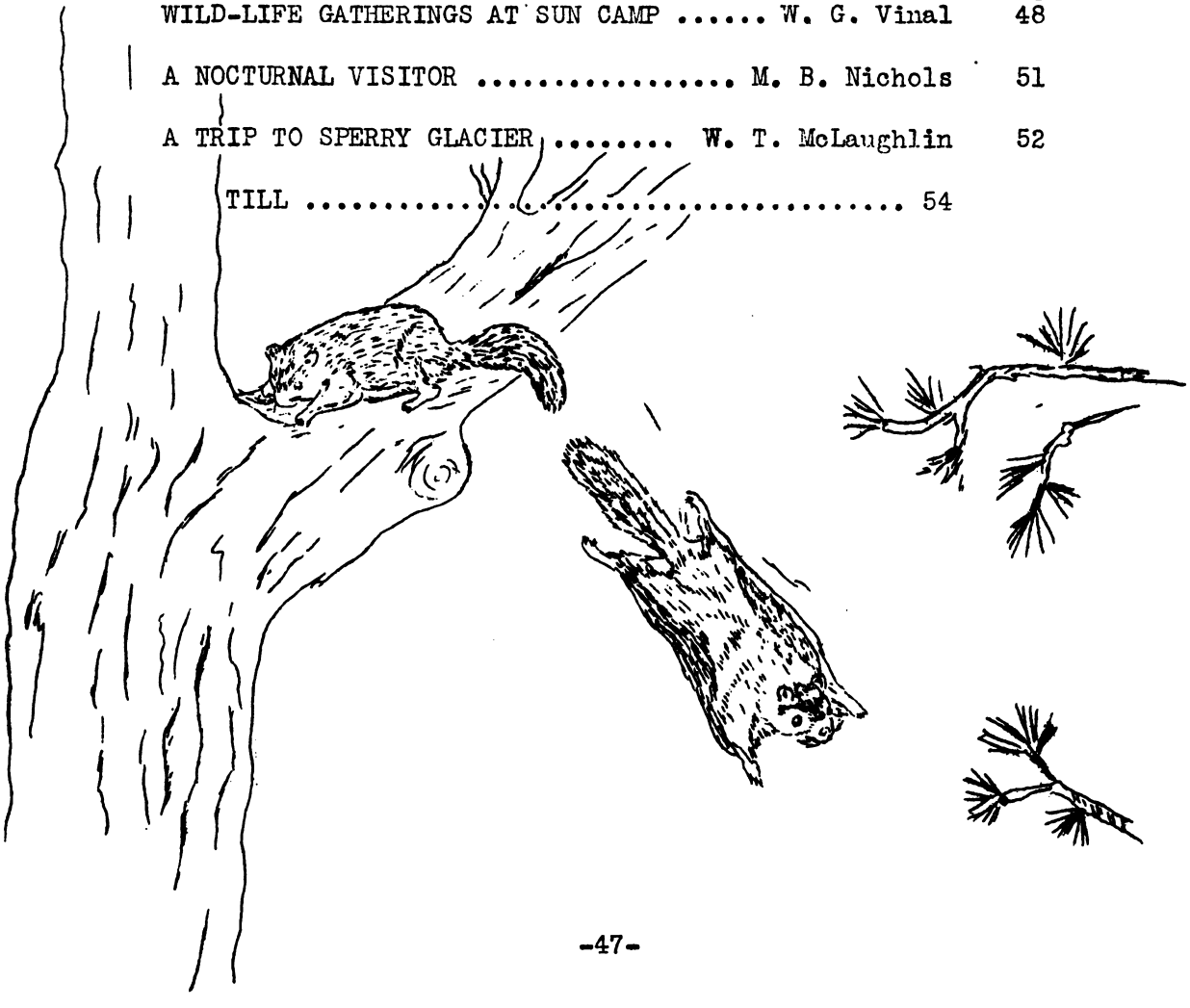

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WILD-LIFE GATHERINGS AT SUN CAMP

Dr. William G. Vinal, Ranger Naturalist

The new Trans-mountain Highway in Glacier National Park is like a secret path made available to autoists. It is not an ordinary road. Pausing at the Checking Station near the Belton entrance, we are greeted with the forceful announcement that "this is the finest scenic highway in the world." Rather of a strong statement we thought. It sounded like the much-tooted city-brands of sunshine foods and all the other super-bargains and largest sizes.

We were driven along the winding road to Logan Pass, at the top of the Continental Divide. Flanking the highway were dizzy peaks reaching into fleecy clouds. The Pass at the summit was like an open door. We gazed through it to the great crags that towered from the eastern slopes of the Rockies. Somewhere out there I was to be stationed for six weeks as a ranger naturalist. The name of the place itself carried a note of mystery as it was called Going-to-the-Sun Camp. What new experiences awaited us at this strange wild-life gathering place?

On the boat from St. Mary the next morning there were some seventy-five individuals leaving auto dust far behind as they headed into the hinterland - a country of saddles and hiking. Mountain peaks, Red Eagle, Little Chief, Citadel, and Gunsight, loomed larger in turn. Lake, sunshine, peaks, mountain streams, forests, timber line, and finally Going-to-the-Sun Chalets crowded into the moving panorama. Many-sided nature interests were peering mountainward for adventure, recreation, and enjoyment. Ramblers, lobby-ers, professors, climbers, and all. And my job was to help each become joyfully acquainted with the wild life about Sun Camp.

"Mister Ranger! What are those large chipmunks?" "They do look like chipmunks but you will note that the heavy black stripes are on the sides instead of on the back. They are the golden-mantled ground squirrels." "No, sir, that one does not have mumps. He is filling his cheek pouches with peanuts. Pretty soon he will scamper away to place them in his underground storehouse." "It is true that these are fat and well fed but all ground squirrels are fat at this time of year. When you realize that their winter sleep is longer than their summer playtime, you will readily see that they have to use every device to tide them over." Suddenly, a woman, frightened by the harmless squirrels, screams and runs to the registration desk to make a formal charge about the "pesky rats." All this is in a day's work.

We will leave the "rat-woman" and those of her kind to complain about such absolute necessities as cats, sewing machines, radios, and, of course, a bridge table or two. Here come two English ladies who have none of these essentials, but they do have greater possessions, a wee flower and a beaming countenance. Puffing and blowing with eagerness, they hasten to inquire, "Do you call this Pasque flower?" I trot out the "Plants of

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Glacier National Park" to assure them. The "good book" says: "A very showy plant, but it blooms so early in spring that it is not likely to be seen in flower by visitors to the park." Well, this is August 12th, but plants sometimes do refuse to behave the way books say they ought. Then I call attention to the fruit head on the rack in the flower exhibition. It resembles that of the clematis in that the seeds have long, hairy tails but is a much more compact head. This brings forth another chottle of surprise as the lady has never seen the fruit in England. However, she is going to watch closely next year. She volunteers the information that it is common in the rock gardens of limestone area. That leads to a discussion of the Siyeh and Altyn limestone found hereabouts. In these few lines you have a glimpse of a few simple facts and what they portray. In this mountain chalet, as with all frontier neighbors, the dudes are widely separated in their ability to make good out of doors.

Here is a very officious lady bustling about the flower show. Pointing at a large specimen she says: "Mr. Guide, is this a Heracleum?" You overlook the fact that the scientific name is printed beneath the common name on the label, and say, "Yes, that is Cow Parsnip." Then in a most patronizing air she informs you that the eastern species has much finer leaves. with a parting retort that "This one looks like rhubarb." There are any number of things that you can say: "Madame, I come from the East," or "It is sometime called 'sacred rhubarb' as the Blackfeet use it in some of their ceremonials," or "Bears and Indians are very fond of the young spring shoots," but for some reason you bite your lips and say nothing. Attitudes are often worn on one's sleeve. They may be assets or obstacles. A child is always straightforward and hungry for facts.

These little incidents may make it clear that one gets from the wilderness what he brings to it. Similar things have been said about art museums and symphonies. One must enjoy his own backyard before he can enjoy other backyards. He must have lingered in a valley near home before he can get enjoyment out of visiting a valley on the other side of the mountain. So, to get a full measure of delight up in the Rockies, one must have already formed the wilderness habit.

It is impossible for a naturalist, amateur or professional, to become lonesome. Wherever he goes, he finds the great show going on. He can always count on such world-wide characters as the bracken or eagle fern, self-heal, and hawthorne He finds that the "blue-bells of Scotland" are not limited to that land but are equally beautiful in North America and Asia. Many a time have I seen eyes sparkle at the sight of such old time friends.

Along with the world-wides are the European visitors and their local cousins. Take the sheep sorrel, for example. This common "sour grass" has started up the trail as if to meet its loftier relative, the mountain sorrel. It is a favorite food of mountain goats, ptarmigan, and hikers who wish to add an acid flavor to their sandwiches. The well-known timothy and yarrow also have their alpine cousins. The most pessimistic can get a little thrill in discovering local species, aping as it were, the flowers of the old world.

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Then come the Americanas. One can tell just what part of the country a dude hails from according to whether he says cottonwood, asp or aspen, or poplar. Those are terms for one and the same tree. There are two species here, the quaking or trembling aspen and the black cottonwood. And which tourist are you? Do you prefer to say shadbush, juneberry, service berry, or just plainsman sarvis, or possibly Amelanchier alnifolia? Whatever you say puts a stamp on you. In the East, the shadbush blossoms when the shad go up the rivers, and the Blackfeet gathered service berries for stews, while the technical scientist talks about the various species of Amelanchier of the Rosaceae.

And there are the aborigines - the flowers of American before Captain John Smith, Lewis and Clark, and all the others. The wild strawberry was a favorite food of the Indians and I certainly got enjoyment when I saw one in blossom on a trip to Sexton Glacier on August 23. Perhaps the trailing shrub called bearberry, with its bright red fruit and evergreen leaves brings up as many incidents as any plant. I have seen it in the Sierras, on Mt. Washington, and it formed my front lawn on Cape Cod. It has crept across the sub-arctic area of the United States. When one grows enthusiastic over finding it here, I suspect that they are tourists from the northern tier of states.

To discover familiar shrubs of our home gardens growing wild up here always brings a burst of delight. One knows that all cultivated plants grow wild somewhere but to really discover one in its native haunt strikes a deep vein of satisfaction. Probably the snowberry with its waxy white berries stands at the top of the list, and many a visitor claims to have the red-osier dogwood in his backyard. Perhaps the keenest response comes in the discovery that there is a close relative of the garden hollyhock growing rampant on the brushy hillsides with showy, attractive flowers. The alpine gaillardias with their purple-brown heads and large yellow rays are not unlike the common brown-eyed susans. The devil's club is surely a mountain edition of Hercules club and must be as effective.

Another classification are the plants-that-are-a-little-different. The finding of a wild kindred whose manners and customs are just a wee bit different makes one wish that so-and-so was along to enjoy it. Take the giant cedar of the western slope. That just reminds one of arbor vitae. And just how did the white hawkweed lose its yellow? And why is the pink meadowsweet gone white? And the glacier lily reminds one for all the world of the dog-tooth violet. The Western larch, the Western hemlock, the Western red cedar, the Western spring beauty, and so on down the long list of Western ilk -- we wonder if they are not the same plants as of the East but with a Western touch, yet not enough to make them different? But just as soon as the botanist substitutes the word alpine for mountain -- well, then we have to give in, for they are different.

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No wonder that some visitors find it difficult to believe that nature and not the government planted these brilliantly colored flower gardens right next to the glaciers, eight thousand feet above the sea. There is not one cirque garden backed by a garden wall a thousand feet high, but hundreds of them. Near low-growing arctic willows, you may find a bunch of gentians carrying the sky in their hearts. With their toes in the stream, and as if dodging the ragged-edged rocks, you discover mats of yellow and red mimulus. Why disparage such a picturesque display with the name monkey flower? Vivid fireweeds, yellow St. Johnswort, dwarf lupines, here and there great patches of red heather, and nodding horsemints, add their artistic touches. To stand by a timber-line garden fires the imagination. It is as though one had at last captured the rainbow.

Nature up in the Rockies has seen to it that almost everyone can find old acquaintances and alongside of them are new treasures. Uncle Sam has appointed ranger naturalists to take you to them, and to point out the whys and wherefores. Every animal, flower, and tree is of interest. So, too, are the rocks. Come up here in the Rockies and find shales and limestone being carried thousands of miles back to the sea from whence they came. Come with the avowed purpose of going afield with a ranger naturalist that you may receive inspiration and adventure along the trail. In the backwoods country of the Rockies, hundreds of tourists go Nature-ward every day with ranger naturalists. Perhaps next year, you, too, would like to join one of these wild-life gatherings.

- - -

A NOCTURNAL VISITOR

M. B. Nichols, Ranger Naturalist

Twice this summer a flying squirrel, Glaucomys sabrinus latipes Howell, has visited my tent on the shore of Upper St. Mary Lake. Both visits were about 3 A.M.

The first time I was awakened by the rattling of a tin can in which there were some cookies. When the flashlight was turned on, I discovered the squirrel running up the door frame and holding in his mouth two cookies which had stuck together. On reaching the top, it rested the cookies on a conveniently placed nail and settled down for a good meal. I arose and put the flashlight within a foot of its face without frightening it. After eating about a fourth of the cookies, it took the remainder in its mouth and found its way out between the side boards and the canvas wall of the tent.

Another time, I was awakened and found the squirrel running about over the side boards, rafters, and ridge pole of the tent frame. It seemed to be searching for some avenue of escape. It would run upside down along on the ridge pole and rafters with as much ease as though right side up. This running about continued for several minues. At times, I was able to approach within a foot or two of the squirrel which seemed to show little fear. Finally I opened the door and my nocturnal visitor darted out into the night.

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A TRIP TO SPERRY GLACIER

Dr. W. T. McLaughlin, Ranger Naturalist

"You can take the ladder or the stairway," the guide calls. Some of the bolder start up the wall by way of the sixty foot steel ladder, while other choose the seemingly greater security of the stairway blasted out of a chimney. At length all are assembled at the top of the wall and stand gasping, partly from lack of breath and partly at the magnificent panorama of bold, serrated crests and jagged peaks which spreads far to the northward and culminates in Mt. Cleveland, highest peak in the Park. This mountain, standing near the southern end of Waterton Lake, reaches skyward 10,438 feet above sea level.

The main body of Sperry Glacier is not visible from the top of the wall, but lies some half mile over, beyond a maze of tilted rocky ridges. The glacier guide leads the way, bearing leftward to the smaller ice body with its capping snow cornices. This ice is extensively undermined and is decidedly unsafe to venture upon. A milky torrent plunges down from the snow and ice fields under Gunsight Mountain and at length flows down beneath the ice sheet under which it has carved an ice cave some ten feet high. Peering into the semi-darkness of the cave one may see the glacial stream finally disappear into the tunnel from which it emerges far below. The polished and striated argillite, in places cut with great tortuous grooves, bears mute evidence of the former extension of the ice over these ridges, and of the slow recession of the glaciers. Looking up one sees great moraines twenty to thirty feet high, ridges composed of great blocks of rock which have been dumped and piled up more recently at the lower margin of the upper ice fields.

Another breath-taking climb over tilted and folded ridges, to the top of the moraine and the full extent of the main glacier is spread below, a great fan of ice three-quarters of a mile in width. Now the party is roped together and strips of burlap bound upon the feet to give greater security of footing. The serious part of the trip is begun. The guide steps ahead onto the ice, sounding the way with the alpinestock to test the ice, and the line wends its way down, past the bergschrund between the ice and the rock wall. Great blocks of rock fallen from the wall above, and being slowly and irresistably carried down by the deliberately moving ice, are passed. Below are piled still greater moraines between which lie lakes of milk-colored water in which is suspended great quantities of finely-ground rock flour. Far below, but hidden by the rock rim, lies Avalanche Basin into which the waters of the melting ice plunge by awe-inspiring falls, Part of the drainage is over the wall into the basin of the Snyder Lakes.

Icy streams, flowing on the surface of the glacier, are passed. At length the group comes to rest at the edge of a great circular ice well in-

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to which the water swirls and plunges, and finally disappears beneath the clear blue ice. Now a part of the glacier is encountered beneath which the rock floor abruptly dips, and the ice is marked by a series of great crevasses. How deep do they go? Some a few feet, some probably to the bottom of the ice. From somewhere far below comes the low gurgling sound of running water. The crevasses are crosses, and the rock ridges are attained once again. Tired but happy the party moves upward toward the top of the wall. It is a worth-while day. The glacier has been conquered.

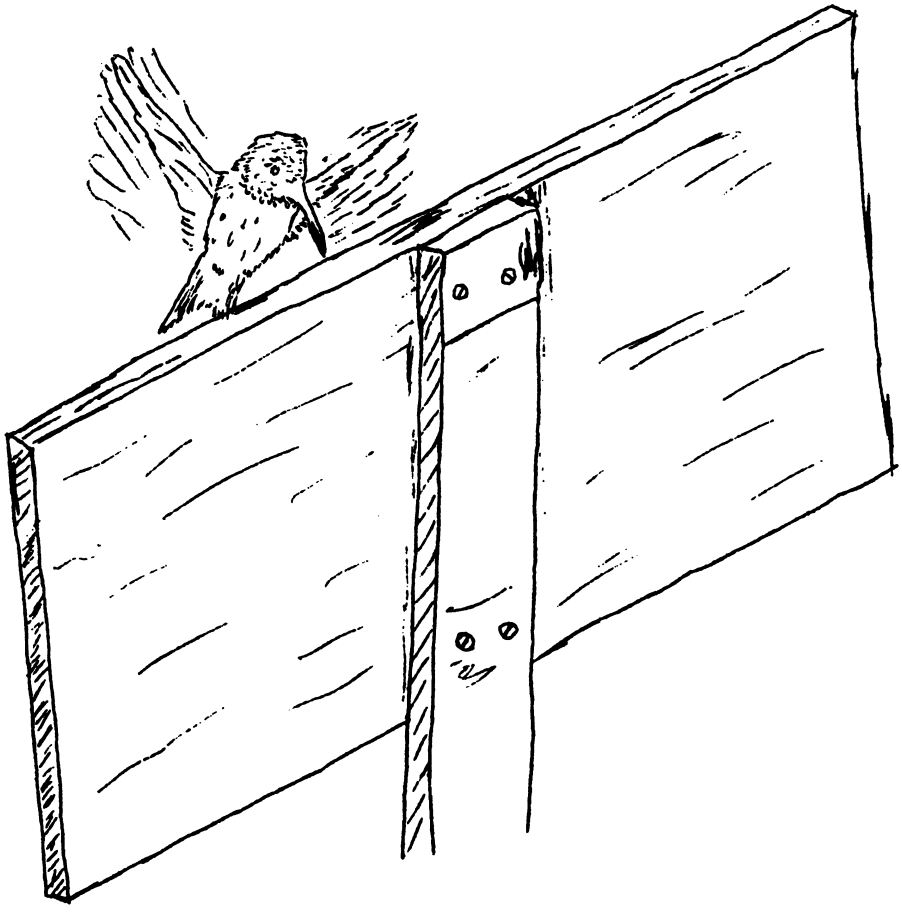
- - - - -

Travel to Date - 55,541 tourists entered Glacier Park by September 1, a decrease of 15.8% under last year.

- Eivind T. Scoyen, Park Superintendent

A Complaint - The month ended with the complaint standing before Twin Falls. "Oh, they can't compare with Niagara!" -- which probably is correct.

- Clyde C. Fauley, Park Ranger



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Fanny's Other Fawn - Fanny is a tame doe that has been petted, photographed and fed by tourists at Lake McDonald Hotel for several years. Each summer she presented two fawns which were delivered to voluntary imprisonment within the hotel corral. This summer, Fanny returned with only one fawn.

"What's the matter with Fanny?" asked every one on observing that she behaved in an unusual manner. She had brought her lone fawn to the corral, but ran immediately back into the woods. Day by day, she returned to her young. Then she would stamp around, snort and depart impatiently.

One day the gardener decided to follow her into the forest. Fanny showed unmistakable glee as she loped ahead, turned around every few feet, snorted, pranced and waited for him to catch up. At last, her secret was laid open; she had another fawn which was hopelessly entangled in wire. The mother had kept it alive and strong by daily nursing and attention.

The gardener quickly extricated the young deer which was led by its mother into the corral. Daily the tourists see Fanny's customary brace of offspring, and hear how Fanny led the rescue of her babe.

- Eivind T. Scoyen, Park Superintendent

Two-Medicine Beaver - The lower footbridge at Two Medicine Auto Camp is often lined with campers watching an old tame beaver that eats, swims, and works each evening wholly unconcerned over his spectators.

- Clyde C. Fauley, Park Ranger

North Fork Homesteaders - A pair of wrens raised a brood of six in my North Fork (Flathead) station woodshed. A hummingbird has its nest with three young ones in a tree near the station. A kingfisher has built its home in the soft bank of the Middle Fork nearby. Several woodpeckers complete the avian community with nests and young in holes in dead trees.

- Channing T. Howell, Park Ranger

An Inquisitive Hummingbird - A sign warning park guests not to smoke on the trails was recently erected near Sun Camp. The lettering and border are bright red, the background is white. I had stopped with a party in front of the sign to explain the reason for the prohibitive measure and to tell of the extreme fire hazard. Suddenly a rufous hummingbird darted up to the sign, hovered for a moment over the red border and as quickly darted away. Many other instances are known of hummingbirds investigating bright red hats or neckerchiefs, thus showing the attraction of bright colors to their eyes. - Maurice B. Nichols, Ranger Naturalist

Nesting Hummer - On July 16, 1930, I discovered the nest of a broadtailed hummingbird (NATURE NOTES, III, 68). It was built on the drooping branch of a fire tree overhanging Baring Creek some distance above the Falls. From the two eggs, two birds were reared. On visiting the spot again on June 16 of this year, I was surprised to find the same nest holding a brooding hummer, probably the same of last year, who meanwhile had made a long migratory trip to Mexico or Central America.

- Maurice B. Nichols, Ranger Naturalist

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More Fish for Glacier Waters - Two varieties of fish famed among sportsmen for scrappiness and size have just been introduced into Park waters. They are the landlock salmon, native of Maine (GLACIAL DRIFT, IV, 44), and Pyramid Lake (Nevada) cutthroats. Both have been known to attain weights of twenty five pounds and are known as the "fightinest fish." Thirteen thousand salmon and thirty-six thousand cutthroat were planted in St. Mary Lake. The planting of these species is part of the program to make Glacier's 250 lakes and many streams one of the greatest attractions for fishermen in the United States. - Eivind T. Scoyen, Park Superintendent

The 1931 Plant - Three carloads of trout have already been planted in Glacier's waters this season while 1,200,000 await in the Glacier Park hatchery for planting in October. A half million of those are rainbows, the rest, cutthroats. Two Medicine Lake has received 20,000 four-inch rainbow, McDonald Creek, 82,700 native cutthroat, and St. Mary Lake 106,000 native cutthroat. A survey of all streams and lakes is to be conducted by the government next year to determine the best program for continuing the excellent fishing of this region. It is our indeavor to keep fishing so good that anyone, whether experienced or not, can get his limit of trout.
- Eivind T. Scoyen, Park Superintendent

A Ruderal Flora - Plants that grow in rubbish, waste places, or recently exposed soils are collectively termed a ruderal flora. Unusually brilliant has been the ruderal flora paneling the Blackfeet Highway, thanks to the dust palliative measures undertaken by the Park. Especially gorgeous have been the wild asters, a single plant bursting into bloom with several hundred flowers. Firewoods, galliardias, wild sunflowers, horsemints, roses, goldenrods, a particularly attractive low-growing varrow, and many others augment with their hosts to gladden the eye and heart as one speeds along over the smooth surfaces.

Camping Out - Camping out is taking a decided boom among Glacier National Park tourists this season. The sport of tenting alongside a lake beneath the pines has lured forty per cent more tourists here this year than last. Auto registration at the four major camp grounds maintained by the National Park Service is thirty per cent greater than in 1930. It may be that motoring vacationists have taken a flare for camping out in order to save money. The tourist who comes to the Park with his own tent can find a cheap vacation. There is no camp ground charge and no fee for fishing. Fishing is so good that a fisherman has little trouble walking a short distance from any camp ground and returning soon with an ample catch.
- Eivind T. Scoyen, Park Superintendent

Eagle Scouts - An outstanding adventure and service for Boy Scouts is a trail building camp held each summer in Glacier Park. Sixty-two picked Eagle Scouts from twenty states in the Union came this year to spend two weeks of August building a trail along Bowman Lake that will take saddle horse tourists and hikers to the high-country. The boys spent five hours of work each day with pick and shovel and had the rest of the time to hike, climb mountains, stalk animals, or study natural history. At the close of the stay, one of the Scouts chosen by ballot was taken into the Blackfeet tribe by Medicine Man Bird Rattler and assistants. This is the sixth consecutive year of this laudable Scout expedition in Glacier Park.

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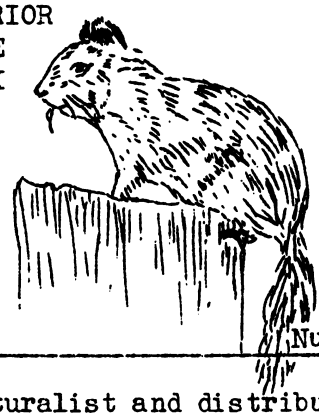

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Eivind T. Scoyen, Park Superintendent Dr. G. C. Ruhle, Editor

"STUDY NATURE; NOT BOOKS." (Agassiz)

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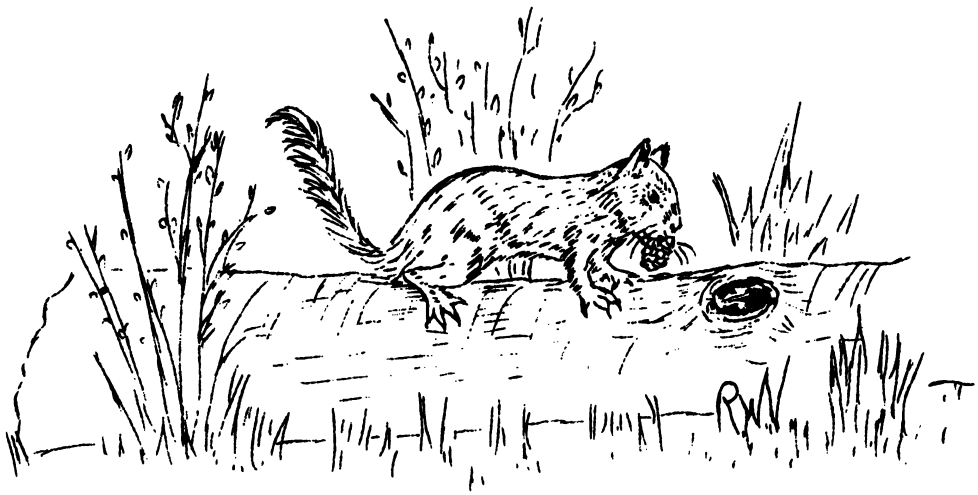

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DEER AFIELD WITH A NATURALIST

Dr. W. T. McLaughlin, Ranger Naturalist

All of us remember the merriment caused by the slinking mongrel that stole his way into the school house when some urchin slyly opened the door to let him slip by. "He seeks higher education, too," we laughed, as the school master hurried the interloper back to the out-of-doors.

Another incident ascribed to a search of higher education occurred on a guided trip afield from Lake McDonald Hotel, tho the searchers were sleek, bold and noble instead of mangy, cowardly and downcast. All last summer two tame white-tailed deer fraternized with park guests at the Hotel. One morning they joined my daily Nature walk as we departed from the lobby doors. Sometimes, like too enthusiastic human members of the party, they preceded me, but usually they were well-behaved and politely maintained their position somewhere in the procession. Unlike less thoughtful members, they never interrupted while I was trying to explain or point out something of interest. Always they were wide-eyed and close to me, looking as eager as any one in the group. They stayed until the very end of the walk of two miles or more.

Their apparent interest in the field trip was climaxed near the end when they added their bit of information to the subject of discussion. I plucked a tuft of squaw-hair (See NATURE NOTES III, 81) from a larch branch, discussed it as it was exhibited and cast it aside on the trail when I had finished. Thereupon one of the bucks walked slowly up to it, smelled it and slowly ate it with relish.

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THE RICHARDSON PINE SQUIRREL

Dr. William G. Vinal, Ranger Naturalist

Thursday, August 20th: An awful thumping on my tent this morning. I say awful because any thumping or rustling is awful when one is cat napping just before a busy day. The disturbance was more steady than rhythmic, as though some prankish neighbor were tossing pebbles at my canvas saying in an original way, "Time to get up."

I cautiously poked out my head and, after craning in several directions spied a squirrel literally raining down cones from the Douglas fir. Out of the one hundred seventy species of squirrels in North America there is only one tree squirrel in Glacier National Park, so this had to be the Richardson Tree Squirrel. Before one cone thumped another would be on the way. The ground was strewn with provender, yet he scurried to the outermost ends of the branches and sent one seed package after another to Mother Earth. If people could get so enthusiastically possessed with one idea there would be an overstocking of the thought market.

It was not long before he descended to gather in the stores. The small cones of the Douglas fir were easily handled. He picked up a cone, sat on his haunches, gave it a twirl and a final grasp, and bounced off to place it in a cache. Before one could say "Jack Robinson," back he would come. He would dash up to a place and scout around, as much as to say, "There ought to be one here," and he was usually right. For many trips he leaped over the pile of cones that I had arranged within four feet of the camera lens. He apparently did not see them or preferred to clean up one area at a time. By actual count, he made thirty-six trips in fifteen minutes, always on the dead run, and carried each packet sixty feet away. His usual procedure was along a root to a trunk where he made a half turn and dive toward a log in a thicket. Possibly to fool you, he would frequently go another way -- one of those circuitous squirrel roadways such as only squirrels travel. It was very evident that he had his favorite paths and also his seldom traveled lanes.

Now and then he would give a high pitched Ker-r-r-r-r-r-r-r, holding his rigid mouth wide open, and evidently trilling with his tongue or gurgling with his throat, I know not which. He might just as well have sung, "Nut trees? Yes, we have no nut trees," for his board and lodging is entirely on the pine-and-fir plan.

Be that as it may, he certainly does not store all his seed in one basket. Although he usually goes to a log he may stop right in the open to hide a cone. Once he was observed to bury ten pieces of cracker at the foot of an alpine fir and later he stuck a bit under a cone on a Douglas fir. He also parked food in the beard moss or lichen and in a mesh of twigs which protruded from an Englemann spruce.

The lodge pole pine apparently yields his favorite crop. In this case he cuts off the tips of the twigs bearing the cones. Although this fruit has spines, it is probably not the reason for including a little of the stem. Possibly the green twig furnishes a variety as does the

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mushroom. He has no union hours but seems to knock off work from about 11.30 a.m. to 1.30 p.m. His cone harvesting extended over a week. Then he seemed to say, "This must do until the next pine crop." Later on, however, he apparently had "hiding days."

Now for time off to eat. With his vibrant, expressive tail a-waving in the breeze he sits up and eats. His dark-red form and white underparts silhouetted against the lake or sky is most tempting to the photographer. Often he will stuff himself for five to eight minute periods. When it comes to cones he always commences with the outer and lowermost scale first. The scales are quickly removed spirally and the seeds eaten on the spot. Experience or possibly heredity has taught him to be as methodical in this as we are with an ear of corn.

Mother Nature takes care that the Richardson Squirrel compensates for his meals. Now and then he forgets just where he stored the seed and in that way a tax is paid to the Douglas fir, the various pines and other conifers, and their future is assured. Now and then a forest nurseryman comes along and robs the squirrel's cache. This taking advantage of the squirrel is a sure method of getting good seed. Just how a squirrel knows the good from the bad is somewhat of a mystery, but I have seen him discard a certain Douglas cone time and time again.

As each individual has his home territory, reforestation is ably taken care of throughout the length and breadth of the land. Thus has the Richardson pine squirrel earned his right and title to a prominent place in Glacier National Park. May his kind live long and prosper.

- - - -

TILL

Dilatory - By the first of September, most of the Columbian ground squirrels at Logan Pass had gone into hibernation for the long winter. Only a few youngsters were to be seen. These had probably been dilatory in rustling the necessities for proper fattening; so they shivered in the chill September air while foraging here and there for a few more calories to carry them through their long sleep.

- Chas. L. Croghan, Assistant Chief Ranger

Grizzlies at Sun - Last year Ranger Art Best reported seeing six grizzlies at one time at the garbage dump at Sun Camp, more than he had ever seen together in that district. (See NATURE NOTES III, 69) In his report for August of this year, he betters last year's record: "We had three large grizzlies in the Baring Creek Camp grounds on the evening of August 6. A week later seven were seen at the dump at one time, three old ones, two yearlings and two cubs."

Goats, Grizzlies, Grouse - In his report for August, Assistant Chief Ranger Tom Whitcraft contributes the following miscellany of game information: "I counted twenty goats on the south slope of Mt. Morgan, seven of which were kids. ... More grizzlies have been noted along the East Side than ever before. ... On a hike of two miles from the end of the road to Lee Creek snowshoe cabin, it is safe to say that I flushed fifty ruffled grouse."

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GOATS AT LOW ELEVATIONS

Dr. G. C. Ruhle, Park Naturalist

Mountain goats in Glacier National Park are so closely associated with bare shale slopes and inaccessible cliffs that it is often forgotten that they do sometimes descend into upper reaches of the forest, or traverse lower country in traveling from one locality to another. Both of these "exceptional" cases are rare, however, as the goat has very little disposition to rove. In fact, it is generally thought that a goat lives within a smaller range than any of our larger animals.

Very frequently in Glacier Park goats are reported in localities which are curiously surprising to many people. A goat has roamed and has been seen on the Transmountain Highway just above the switchback during the last two years. On a snowshoe trip last January, the Chief Ranger and I saw some goat signs in this same vicinity. Presumably it is one individual that lives here, for it is a commonly known fact that the animal, unless seriously disturbed, will ordinarily remain in one spot as long as the food and water supply lasts.

Last spring, Park Superintendent Scoyen found the pelage-covered shank of a goat hanging in brush over McDonald Creek, near the outlet of Avalanche Creek. Possibly it belonged to a goat which met disaster upon trying to cross the swollen waters of the stream.

Reports have come from time to time of the observance of a goat near the narrows of Badrock Canyon, twelve miles below Belton. The elevation is low, about three thousand feet, and forests cover the low mountains on both sides. The walls of the canyon are precipitous enough to be called "goat rocks."

On her way to Belton on September 2, Mrs. Hugh Buchanan, wife of the Lake McDonald District Ranger, saw three goats and two kids on the highway two miles below Lake McDonald Hotel. They did not become frightened by her car, and she drove within thirty feet of them.

It may thus be seen that while we are accustomed to look for goats on wild, barren, alpine heights, they sometimes do come down to lower elevations where they may be readily seen by the visitor in the park.

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THE PTARMIGAN WALL TRAIL CONSTRUCTION

-- Assistant Engineer George W. Reed

On the left from Swiftcurrent Lake, the Garden Wall with Mt. Gould in its center shuts out the southwestern horizon with its rocky palisade. To the north, separated from the Garden Wall by the prominences of Grinnell, Swiftcurrent and Wilbur, the Ptarmigan Wall forms a jagged and forbidding barrier to all who would go beyond its pale.

In 1929, a new route was proposed to eliminate the uninteresting trail with its depressing climb between Many Glacier and Red Gap, enroute to Waterton Lake. The distance was to be shortened ten long miles of torture; the time, a full three hours of fatigue.

After reconnaisance and location, surveys were made from the foot of Ptarmigan Lake to a point one mile below Red Gap on the old trail. Ptarmigan Wall remained still a big question on this route. Whether the trail should go over or through the wall of solid rock was an unsolved problem to baffle the engineers of the Park Service.

There were more surveys and more balancing of estimates; the famous wall was destined to be pierced by a one hundred eighty-three foot tunnel, nine feet in height and six feet in width, with a three-foot treadway for the horses and an eighteen inch shoulder or footing on each side which would tend to prevent either rider or pack from coming in contact with the solid, fine-grained limestone walls of the tunnel.

Tunnel construction was begun during the latter part of July, 1930. The hole was forced through on September 20, 1930. The trail construction, complete to the south portal of Ptarmigan Tunnel, was much longer awaiting completion on the north face of the wall.

The sheer, resistant ledges on the north side refused ready passage-way, but the persistent efforts of man, repulsed in October, 1930 because of heavy snow, renewed their vigor during the first part of June, 1931, and finally made a brilliant and dazzling finish on July 3, 1931, just in time to allow "Old Timer," of coast-to-coast radio fame, and his party of twenty-six nature-loving companions to pass through the tunnel during that afternoon, and thence slowly down the trail on the north face of the vanquished wall, which, nevertheless, held itself lofty in defeat.

The new trail in the high mountains, chiselled across the precipitous faces of cliffs and crags, presents to the traveler most magnificent and stunning views. The exclamations of wonder as the tourists gazed down to the vast depths below, the lofty heights above, the lofty, cloud and glacier draped majesty of Mt. Merritt, the azure tinted Lake Elizabeth nestling down between the lofty ranges to the north and the Dominion of Canada still further in the distance, gave proof that the Ptarmigan Wall trail construction was a well-earned and just compensation to the National Park Service and a worthy tribute to her engineers.

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MOUNTAIN CLIMBING IN GLACIER
(Part IV)

Dr. M. J. Elrod

In 1923 Norman Clyde, of California, visited Glacier National Park, and, alone, ascended thirty-seven mountains. The following year he ascended twenty-three more summits. He began with Mt. Henry, reached by easy trail from Glacier Park to Two Medicine. From Mt. James he followed the Continental Divide, taking not only the summits actually in the Divide, but also those reached from the Divide by short ridges or spurs. During 1923 he got as far north as Many Glacier, ascending practically all summits nearby. Of the thirty-seven mountains he claims first ascent of eleven, but he is quite surely in error.

In 1924 he accompanied the Sierra Club, and intended to equal if not surpass his 1923 number. But he stated that accompanying the club was a disadvantage, and prevented him from making his object in number of ascents. He climbed to the top of only twenty-three. He began with Heavens Peak and Mt. Vaught near Lake McDonald. Next he is in almost the extreme north of the Park; he climbed Cleveland and Merritt, coming back southward again and ending with Mt. Allen near Many Glacier. Of those mountains ascended he claims first ascent of Mt. Merritt and a mountain in the Guardhouse group west of Sentinel Glacier. He traveled alone, carrying provisions and blankets. Usually he spent the night in a sheltered spot at some high elevation, and was ready for the ascent of some nearby summit the following morning, without making a long journey or partial ascent before the real climb began.

He expected to return in 1925 and complete his list of ascents, but for some reason did not return. He has set an example of mountain climbing that will be hard to equal.

Clyde says: "The view from Blackfeet Mountain is one of the finest in the Park. From Mount Jackson the view is wonderfully beautiful. A very fine view may be had from Little Chief, especially in the St. Mary Region. Insight is an easy climb from the Sperry side. Care was necessary in passing over the Blackfeet Glacier. Triple Divide may be climbed easily from the trail. From Mt. Logan there is a superb view of the Blackfeet group, particularly the glaciers. Lake McDonald from Mt. Edwards is especially fine. Reynolds commands a superb view. Gould is one of the best vantage points in the Park. Wilbur is only for experienced rock climbers. The view from Chapman extends far up the Canadian Rockies. Cleveland commands the most extensive panorama of the Park." One's heart unconsciously warms to the person who can do and does such things, and does them only for a pastime. It was irksome for him to write out some notes, on invitation, but fortunately he did so.

A brief story of the ascent of one of these sixty ascents will probably be of interest, since it is of one of the difficult mountains.*

Mt. Wilbur (elevation 9293), in the Many Glacier region, an abrupt and forbidding mass of limestone, received no attention from mountaineers until 1924, when Norman Clyde made the first ascent. Clyde was a human goat, firm footed, clear headed, cool, and very careful.

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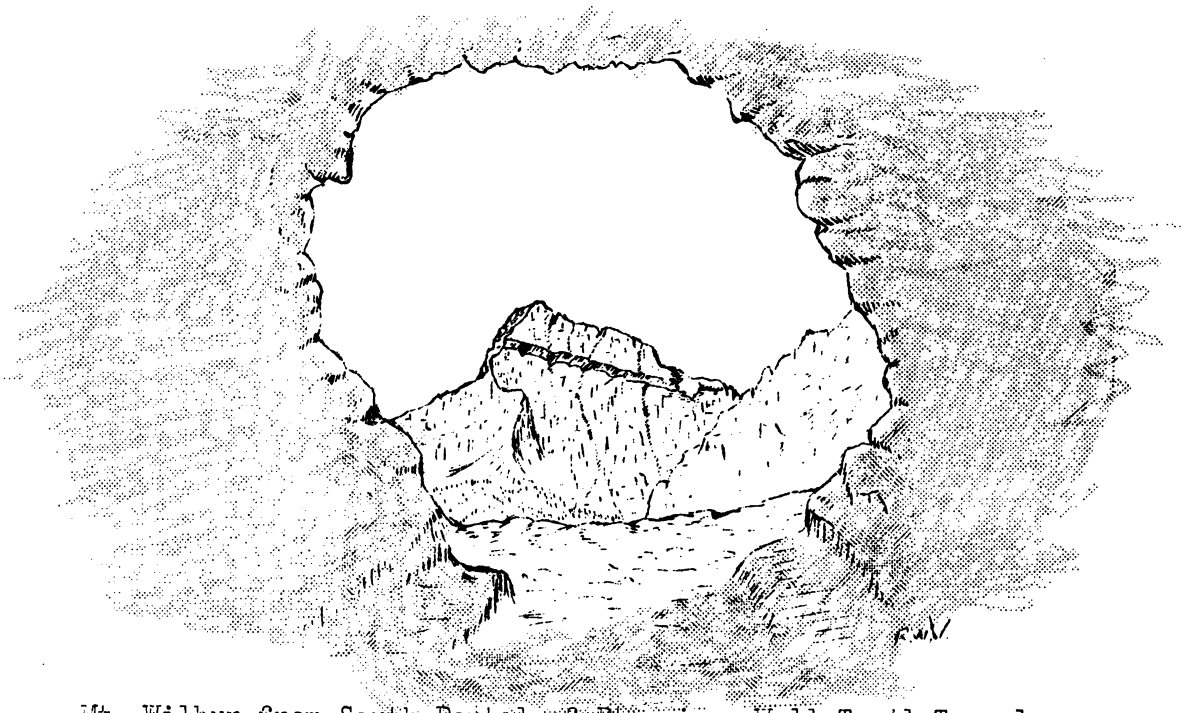
To most people Mt. Wilbur seems inaccessible, and to most people it is impossible. To the favored few only it has succumbed. It looked steep and forbidding as Clyde and the writer view it from the hotel veranda one afternoon, scanning it very carefully with glasses. Across the face of the mountain, a few hundred feet from the top, a band of diorite, 150 to 200 feet thick, crosses like a dark ribbon. Above and below is Siyeh limestone. It was agreed that the mountain seemed feasible of ascent to this diorite band Through it and above no one could tell until the band was reached. The following night Clyde informed me he had made the ascent, and had returned. The evidence was a cairn or monument of rocks on the summit. Here is his simple statement:

"This afternoon I decided to walk to Iceberg Lake. Wilbur was in front of me all the time, tempting me. Suddenly the impulse came to do it now. I dropped into the brush below the Iceberg Lake trail, crossed Wilbur Creek, climbed the rocks to the ridge above Bullhead (projection from Wilbur), ascended the ridge to the cliffs, crossed the face of the mountain, high up, to the long snow line on the figure four. Here I found a way to get through the diorite band, above which it was not difficult. I came out on the north slope of the main summit, up which a chimney led to the top. It was late when I reached the top, the wind was blowing, and a storm was brewing. I hurriedly made the rock pile on the summit, and hastened to get down before darkness or storm came."

*Stories of his ascents by Mr. Clyde are to be found in past numbers of this publication. At least one additional one will follow in an early number.



Mt. Wilbur from South Portal of Ptarmigan Wall Trail Tunnel

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EDITORIAL PAGE

"SPORTSMEN"

In his August monthly report, Assistant Chief Ranger Charles Croghan suggests that a strip of land a mile wide paralleling the western boundary of the park be set aside as a game preserve. Throughout its length, this strip contains the North Fork Highway of Blackfeet National Forest. This is used by hunters for the easy slaughter of deer which have grown more or less fearless of men inside the Park, and which have spread out across the river with the coming of autumn.

Mr. Croghan's suggestion is timely though Glacier National Park suffers less from ruthless men with guns than do some of our other parks. This is probably due to the fact that Glacier is wilder and more primitive, especially in outlying districts, and game has not become quite so tame that it has lost all shyness from men. Moreover, hunting in bordering National Forests is terrific. Animals do not so readily leave the sanctuary which the park affords during hunting season.

I have known of so-called sportsmen who linger in a settlement adjoining a park until bad weather forces the unsuspicious and half-tame elk from the safety zone where food is covered by snow. These elk are as easily slaughtered as if they were domestic cows grazing in a pasture. I have known these same trophy-mongers to entice tame deer across the park boundary with a loaf of bread. These deer, suspecting no evil from hands from which they had been taught to receive nothing but good, are heartlessly murdered. Anything to get that trophy to hang on the wall of one's den! With what swelling of pride can such huntsmen gaze at the mute head of the victim of their prowess! I think less of these than of that other type of sport who buys his trophies from frontiersmen and Indians, and tells long tales about the hardships endured and the dangers faced in bagging the animal.

Glacier Park game does suffer from two other factors which are not so serious in other preserves. Because of her far-flung reaches and the many natural concealments for such operations, poachers still make their toll despite the ever watchful eyes and tireless feet of the ranger. Glacier, too, because of the great elevation of her topography, is not natural winter range for game. Severe storms invariably force the animals to the greater food supply outside the Park. Throughout the length of the eastern border stretches the Indian Reservation, upon which no hunting season may be legislated. Although fullbloods have, as a rule, not abused their lawful privilege and have taken only the meat which was necessary for food, others have not been so scrupulous (See NATURE NOTES III, 43). By negotiation with the Indians and extension of the Eastern territory, the Park hopes to end this deplorable situation some day.

A National Park should serve as a reservoir in which game and fur-bearers should prosper until they spread out over surrounding territory where they become legitimate prey. That is as it should be. But no one with a love of our wild life will wink his eye and overlook the tactics of those who are not sportsmen enough to go out and get their prizes in a sportsmanly manner.

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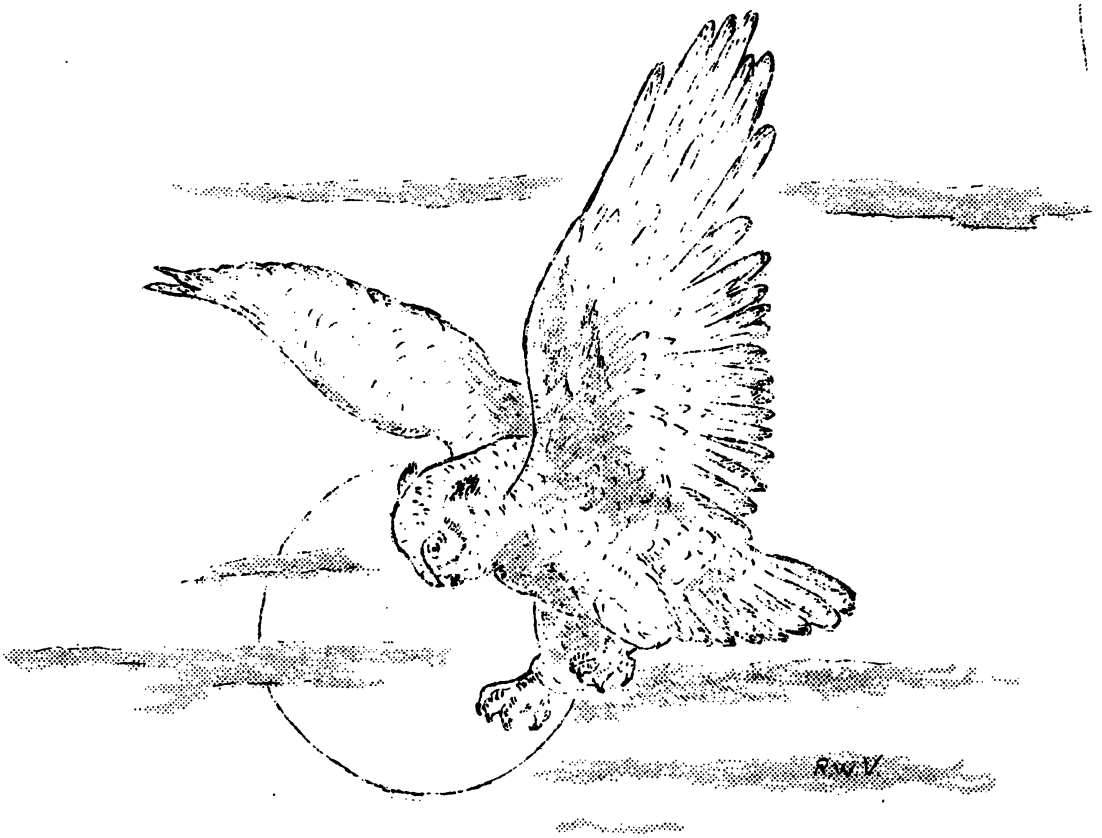
GLACIAL DRIFT

NOTES FROM

GLACIER NATIONAL PARK



OCTOBER

1931

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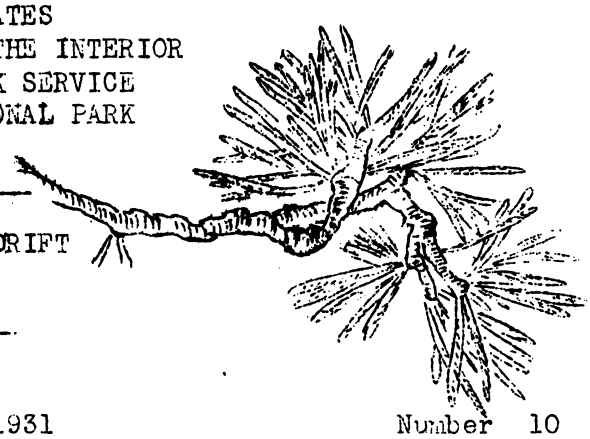
UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
GLACIER NATIONAL PARK



GLACIAL DRIFT

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A monthly pamphlet edited by the Park Naturalist and distributed by the Educational Division of Glacier National Park to all interested in the Park and its natural history.

Eivind T. Scoyen, Park Superintendent Dr. G. C. Ruhle, Editor

"STUDY NATURE; NOT BOOKS." (Agassiz)

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Soon after the Pasque-flower, the carpet pink and the dodecatheon appear as the first flowers of springtime on the East Side, the slender campanula hangs out its slender bells to wave in the brisk winds of the young year. Bell after bell blossoms as summer's flowers come and go. The air grows chill; Jack Frost appears to paint blade, frond, and leaf with pallete shades. Amidst the riot of reds, yellows and browns that he splashes with wild abandon, here and there a modest blue is seen. Here and there lingers an aster from that numerous host which decorated the highway's fringes in summer's wane. And lo! here too blooms the demure campanula which has faithfully added her cheer thru the whole flower season.

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PROTECTION FOR THE HOME

-- E.T. Scoyen, Superintendent

I was apparently sound asleep. My first conscious sensation was that someone was jabbing me in the ribs. Then I heard my wife say,

"There is someone in the house!"

This brought me back to earth with a start; I began to listen intently. No doubt about it. Someone was walking about downstairs. We could hear the floor creak and the shuffling sound made by his feet as he tried to sneak about unheard was too plain for the head of the family to excuse it as something else and go back to sleep again, which was exactly what he would have preferred to do at just this moment.

Now I have often wondered just what I could do if a burglar ever came in the house during the night. I tried to figure out a course of action. The most obvious thing to do was to get a gun. I therefore went to the bureau and got my forty-five. I must confess that I made no effort to hide my movements. I stamped loudly on the floor and spoke in a loud, tho somewhat thin, voice to my wife. No doubt the midnight prowler would hear this activity and leave the house. I stopped to listen -- he was of the cussed persistent type, as he was still slinking around.

Had I been home alone I would have let the whole situation rest at this point. The robber was welcome to anything in the house as far as I was concerned. However, every man likes to be somewhat of a hero to his wife, and, under the circumstances, there was nothing for me to do but investigate. Just as I reached the head of the stairs the broom in the kitchen crashed to the floor. I descended half way to the living room and then sat on the step to await developments. Things had reached the stage where I wanted the intruder to hunt me for awhile. This would at least give me the first opportunity to shoot.

Evidently he was obliging. I distinctly heard him open a box of safety matches and attempt to strike one! However, he changed his mind and kept on moving about in the dark. I sat on the step hoping he would leave. Finally, when I knew definitely he was in the kitchen, I ran down the steps and turned on the dining room light. I then worked from one room to the other, turning on each light in turn. Finally, when every light was on, I made a complete search but found no one. No doubt but that he had left. A check of all doors and windows indicated that it would have been impossible for anyone to enter and leave the house as everything was locked tight and all screens in place. Finally I just had to believe that there was no one, nor had there ever been anyone in the building. I went back to bed.

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The noise started again. Suddenly whatever it was started up the stairs. Thump! Thump! on each step as he boldly ascended. Mrs. Scoyon let out an ear-splitting scream. In one motion I left the bed and landed in front of the bureau, secured the forty-five again, and took my station in front of the bedroom door ready to protect my home at the cost of life if need be. Finally, the intruder reached a point near the top. I pointed my gun and waited. One more step and he would be in the doorway. He took it. I was looking down the barrel of my gun, not at a criminal but at a poor, lost little flying squirrel who had evidently fallen down our fireplace chimney, and whose prowling about had been entirely in search of a way out of the strange place he had fallen into.

I herded him out of the back door and the incident should have been closed. However, one thing still bothered me and that was how such a small animal could make the floor creak like a grown person. I looked outside. It had been raining lightly and the house, after a period of drought lasting for the five weeks previous, no doubt was creaking as a result of swelling of the wood due to moisture.

I am afraid that I do not wholly relish the jokes passing back and forth in the family about the elaborate precautions I took to protect life and property against this midnight "marauder."

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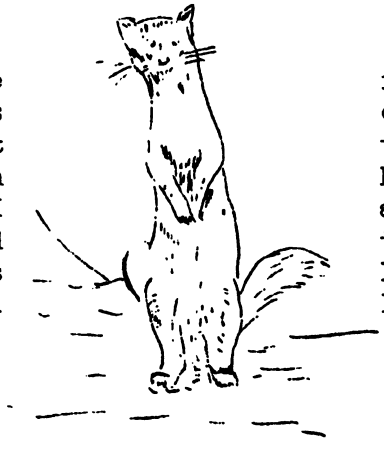
KEEP YOUR CAMERA LOADED: Recently I made a trip to Avalanche Lake to secure some pictures of a beaver colony at work. I must confess that between pictures I did a little fishing. After working my way up to the head of the lake - the beaver house is near the foot - I was on my way back following the old trappers' trail along the shore. I knew that I had only about five feet of film left in my camera, enough for about one shot. Suddenly, I noticed what I first thought to be an unusually large squirrel climbing a tree. Closer inspection revealed it to be a pine marten.

I have spent all of my life in the National Parks and much of it in sections of Yellowstone where this animal is abundant, but this was the first time I had ever seen one in his natural habitat in broad daylight. I approached within six feet of him and started the camera. After taking him in several poses I remembered that my film had come to an end a long time ago.



I started to reload. The marten was very much interested in myself and what I was doing. He hung on the tree trunk about five feet away and indulged in all kinds of contortions so that he could see from every possible angle. I finally got the film threaded through the gears, talking encouragingly all the while to the little wilderness inhabitant who was still watching. In replacing the cover of the camera I had a little trouble and had to give the matter close attention. When I looked up, this member of the weasel family had left. I never saw him again. If my camera had been loaded, I would have secured a set of motion pictures which would have been almost priceless. Hence my advise: "Always keep your camera in readiness for instant action." In the wilderness you may always expect the unexpected.

-- E. T. Scoyen, Superintendent

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BARING CREEK NATURE STUDY STATION

Dr. William G. Vinal, Ranger Naturalist

Comment: - As an experiment, Dr. Vinal placed a Nature Tablet at Baring Falls containing the following information. The article is self-explanatory. Some of the mites, recorded by the users, are recorded at the end. - Ed.

Many people on the nature trip to Baring Falls do not care to catch the two o'clock boat. They prefer to loiter at the falls. There are others at Sun Camp who like to saunter this way when time permits and the spirit moves. This tablet has been prepared for loiterers and saunterers who care to tarry and reflect. You can sit on this stump and see everything mentioned. By way of experiment, we would like to suggest that you also make an observation and add it to the sheet in back. The Ranger-Naturalist cannot think of everything, and if each one of you add your mite, with name and address, it may be that we can persuade the Park Naturalist to send you the copy of GLACIAL DRIFT that contains this article. And last of all, please leave this tablet as you find it so that the rain and wind will not destroy it.*

1. You are sitting on the right bank of Baring Creek, at the foot of Baring Creek Falls. When the glacier plowed down St. Mary Valley it left Baring Creek Valley up in the air. This is known as a hanging valley. There will be a water fall here until the creek wears the cliff down to the level of the valley floor of St. Mary Lake.

2. The cliff is made up of red argillite, a kind of shale which was almost baked to slate. It is this same rock that gives the beautiful color to Red Eagle Mountain and the other peaks.

3. This cliff is being quarried by Jack Frost. The vertical cracks are called joints and the horizontal cracks are along the old bedding plane. The largest rock to be quarried weighs about twenty tons. It landed on its edge. It was pushed off the cliff by the ice a long time ago, so long, in fact, that several plants have had time to get a foothold and grow on top of it.

4. Note that the bedding plane has been inclined upward toward the east or the Great Plains. When the clay that went to form this shale was deposited it was put down in a horizontal position. Later it folded and formed the Rocky Mountains. This folding was caused by the cooling and shrinking of the earth. If you should follow one of these layers you would find that it goes up and down.

- - - -

* This information is given in the form of tabloids. This gives opportunity for discussion. Then again, you do not need to take so many that you get mental indigestion. You will have to write your own prescription. Take as many as your frame of mind will permit. Some folks will find that three Baring Creek tabloids per day will give the best results. Mix with potion plenty of fresh air and sunshine.

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5. When a block of shale falls out of the cliff it is rhombohedral in shape. Such blocks can be seen across the creek. Can you find a perfect rhombohedral block of red shale? You may remember that St. Mary Falls has three parts. The water in the upper falls is at right angles to the water in the lower falls. This is due to rhombohedral quarrying. St. Mary Falls is 1.5 miles along the trail. If you have not seen it you might like to continue your journey to that point.

6. The water in this stream comes from Sexton Glacier, which is 6.6 miles from Sun Camp. The size of the stream would make it seem as tho the glacier would last about a week. At the present rate of growth and melting, geologists estimate that this glacier will last over a hundred years. It is a cake of ice about 150 feet thick and about one-fourth of a mile from the outer edge to the back wall.

7. The milky color of the water is due to rock flour being ground in the glacier mill. Louis Agassiz suggested the name "Gletschermilch."

8. Each day this snow-fed stream deposits a veil of sediment on the bottom of St. Mary Lake. St. Mary Lake is 200 to 300 feet deep. If the streams deposit an inch of silt in a year, how long would it take to fill the lake? The mountains hereabouts are a mile high. They are made up of sediment which was deposited in an inland sea. How long did it take to make a deposit a mile thick? It is estimated that this shale was deposited about 1800 million years ago. It is now on the way back to the sea from whence it came.

9. The rocks in the stream are rounded. This is not done by the water alone but by the sediment carried by the water. How long would you have to roll and rub one of the rhombohedral blocks to make them round and smooth? The smaller pebbles have been carried beyond the foot bridge. How long before they will get to the ocean?

10. You are resting in a grove of Engelmann Spruce. Note the clean, tapering trunks. The ground is covered with their light colored cones.

11. The largest tree in the grove is a black cottonwood. It does not usually attain such a size on the east side of the Rockies. You will be interested in its deeply grooved bark. True to form, this cottonwood grows near a stream.

12. The water ouzel had a nest back of Baring Falls the last of June. In early July the young birds came out to be fed by the parents. It is customary for this bird to build its nest back of a water fall which may serve to protect it.

13. The roots of several trees have been exposed by erosion. Three of these trees are leaning streamward and two have nearly died.

14. The log that lies along the bank has been there at least nineteen years, as shown by the fungus growing on it. You will note that the fungus adds a new growth each year on its lower side.

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15. Note the overhanging ledge. That is a good place to retreat to when it rains. The next block of red argillite will probably be pried off at that point. However, the chances of being hit by this rock are very remote.

16. DO NOT FORGET TO ADD YOUR MITE.

Some Mites - "We ...have had the unusual privilege of trying out the experiment of Cap'n Bill and declare it a complete success. Most original, Cap'n Bill...."

"Is the water from Baring Falls good to drink? Has the little tree to the left got the mumps?"*

"I am wondering what blight is causing the death of so many of the small spruce."**

"What is the little slate-colored bird that goes bobbing about just under the falls?"***

"From here up to St. Mary Falls you can see, either in fruit, flower, or just leaf, many of the specimens in the lobby at Going-to-the-Sun Chalet. Look for them on the trail. Look again at the fine collection when you return to the Chalet."

The Editor Hastens to Reply - *The water in Baring Creek is good to drink. This is true of all rapidly running mountain streams not contaminated in the close vicinity by animal refuse or excreta. Ordinary vegetable matter in a stream does not cause disease.

The little tree on the left, mentioned in the question, does not have mumps. The swellings are caused by irritations set up by fungi living within the tree. The increased rate of growth, like the growth of cancer cells in human beings (whose cause, however, is not clearly understood) is a sign of disease, not of health.

**More probably, the inquisitor means "fir" rather than "spruce," since there are many dead or dying young firs near the falls. Death in these has been, or is being, caused by a root fungus known botanically as Armillaria mellea, known commonly as honey or shoestring fungus. The vegetative part of this fungus is composed of white strings, or hyphae, which mat together to form a white felt immediately under the bark at the base of the tree or under the cortex of the roots. From this felt, known botanically as mycelium, the fungus spreads through the soil or under the bark in black "runners" which, as they grow larger, tend to become flattened like shoestrings, hence the common name. The fruiting-bodies of this fungus are honey-colored, gill-bearing "toadstools" or "mushrooms," often seen growing in clusters on decaying logs, stumps or bark, sometimes seen growing at considerable distances from their victim. They are edible and delicious, if fried and served on toast. Honey fungus attacks deciduous trees, such as oaks, birches and orchard trees, as well as the conifers, such as the pines, firs and larches. It attacks dead as well as living tissue. Death in the latter is caused by the destruction of the cambial, or growing tissue.

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MOUNTAIN CLIMBING IN GLACIER

Dr. M.J. Elrod

Clyde thus proved that Wilbur could be climbed, and that without rope or other help. He blazed the trail, as it were, made the first ascent, and left on the summit proof of his statement that he had made the climb.

When Clyde made the ascent the Sierra Club was camped at Lake McDermott, almost at the foot of Wilbur. The club had several women mountaineers, whose feats of courage and endurance were matters of record. Some of these women wanted to make the climb, but a rule of the club forbade women climbing mountains without male escort, so it is stated, while on this particular trip. However, two women, Eleanor Davis, of the Colorado Mountain Club, and Eleanor E. Bartlett, of the Sierra Club, slipped off unknown, followed Clyde's directions, given only in a general way, and reached the summit safely. Their names were left in a small match safe, deposited among the rocks of Clyde's monument. At the time there were rumors that the women had made the ascent. In 1928 climbers found their names in the match safe.

The mountain was next attacked by J. M. Warner, Santa Paula, California, July 22, 1927, who took a different route in part, ascending the mountain from the northeast, as Clyde had done. But he found the same chimney through the diorite, apparently, that Clyde had followed. He returned by a new route, down the south face of the mountain.

In 1928 Warner, accompanied by Grace Boreen, of Minnesota, a young woman of small body, but possessed of courage and endurance, ascended the mountain August 9. Miss Boreen was not a mountain climber, so the journey was slow and long. They started at six in the morning, reached the summit at twenty minutes to three, stayed an hour on the top, and were back at Many Glacier about midnight. Rope, water and provisions, in all about 30 pounds, were carried to the top, as also a kodak. The day was clear and beautiful. They chose the southeast shoulder, composed mostly of shale, which they followed to the figure four, which shows in snow all summer. They followed a shelf to the long upright of the figure. This they followed upward, later crossing the mountain face to the north side, apparently following Clyde's first route, through to the summit. They reported the diorite rather good going, but the red shale above the diorite was bad, loose rock, easily broken, and not giving firm footing.

The top of the mountain is about as big as two city blocks and rather level. The mountain top is mainly slab rock, broken and loose. While there is no soil, a few flowers grow in the rock clefts about the summit, obtaining a precarious existence.

Warner and Miss Boreen descended the Swift Current side of the mountain, down which Warner had come on his 1927 trip. His 100 feet of rope was several times used for his companion to its full length, while he scrambled down some how. Several times he feared they would not make it, but the last cliffs were finally passed in safety.

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Two days later G. M. Kilbourn, of Texas, made the ascent, via the southwestern ridge. He apparently found the chimney thru the diorite up which Clyde and others had gone. He repeatedly found the way blocked with boulders, but there was always a way around, ledges to the left affording meager hand hold and foot holds. While it is not a journey for persons with jumpy nerves, Kilbourn says, he reached the summit rock pile without having encountered anything quite as difficult as he had expected.

Kilbourn's Kodak pictures were poor and did not satisfy him, so he made a second ascent a week later to secure better ones! This time he had a companion who could not make the summit. The cliffs were too stupendous, and the views down too precipitous for his nerves. He therefore waited the ascent and took his pictures.

A few days later Leopold Seethalor made an ascent of the mountain, as previously mentioned. He was accompanied by a young man who could not make the full ascent. Seethalor hoped to make it up and back from the trail in five hours. He did not miss the time far. He reached the summit a little after eight, returning mostly in darkness. Seethalor is an expert mountaineer, was raised among the Swiss Alps, and can go where few can follow.

Wilbur has, therefore, been climbed seven times by seven people, two of whom have made two ascents. Owing to its forbidding appearance it will never be attacked hastily, but events have proven the ascent need not be accompanied by danger, if attempted in late season when the snow has largely melted from the rocks and ledges.

The New Editor - The Park Naturalist is in the East on a lecture trip, after which he will go to Europe to study European methods of educational exhibits. During his absence from the Park, Glacial Drift will be edited by Mrs. Ruth W. Vincent, wife of Assistant Superintendent R. R. Vincent.

Mountain Goat Swims Lake Elizabeth - Most animals can readily swim if occasion demands, a fact oft forgotten with creatures far dissociated from water. On a trip into the northeast portion of the Park, the fishing party of United States Senators Walsh and Wheeler of Montana was greeted by a mountain goat swimming across Lake Elizabeth. The lake is slightly less than one-quarter mile wide.

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THE SADDLE-HORSE TRIP TO GRINNELL GLACIER

Ed Flottman, Ranger Naturalist

The members of saddle-horse parties to Grinnell Glacier are learning that an accompanying naturalist doubles the value and enjoyment of the trip. Evidences of this are to be found in the comments and remarks made by them at the close telling how many things had been pointed out that otherwise they would not have noticed. The naturalist who accompanies the party rides at various places in the train, so as to neglect no one. He is kept busy answering a battery of questions so that the tourists wonder how he can spot so many objects of interest along the trail. As mountain peaks, cirques, strata, plants, animals, birds and even insects are pointed out, tourists following press their horses closer, while people ahead turn in the saddle to catch every word.

As an example, my trip on July 21 will suffice. Near the glacier, a ptarmigan hen with five chicks paraded for the party. Further back on the trail both a Franklin and a Ruffed grouse favored by perching on rocks near the trail. The ptarmigan notified the party of her presence by her calling, but the other two members of the grouse family would have been passed by unnoticed, had no naturalist been along. Again, a partially concealed mule deer near Grinnell Lake was passed up by leaders in the party, and was first seen and designated by the naturalist.

Especially popular has been the short talk given immediately after the final cup of luncheon coffee. And this is rightfully so, for where could one find better inspiration and setting for a discourse on natural history than in a spot completely surrounded by the impressiveness of the site of Grinnell Glacier?

TILL

Slips Like This Shouldn't Count - A squirrel with headquarters near the Belton checking station was busily engaged in garnering a winter supply of cones. A lodgepole pine had been thoroughly harvested, and attention was now ambitiously given to the huge pendant cones which hung at the tip top of a white pine. Far out on a summit limb hung an extra large, extra tempting cone. It was looked upon with lickerish eyes; the squirrel scurried out to it; a nip here and a nip there and it was on its way to Mother Earth. The limb, being suddenly released of its weighty fruit, flipped skyward, much to the surprise and discomfiture of the harvester, who, taken unawares, was tossed by the limber branch. Down he fell, right after the cone. The tail came too, but with mad gyrations, like the propellor of a gyro-plane. Cone and squirrel hit the ground with a thud. The latter sat up with surprise and consternation; gazed about shamefacedly, for who had ever heard of the fall of so nimble a steeple-jack before? Thankful, perhaps, that no bones were broken, and assured that it had received no body injury he calmly seized the cone and bounced it off to its cache of winter supplies.

-- Charles L. Croghan, Asst. Chief Ranger

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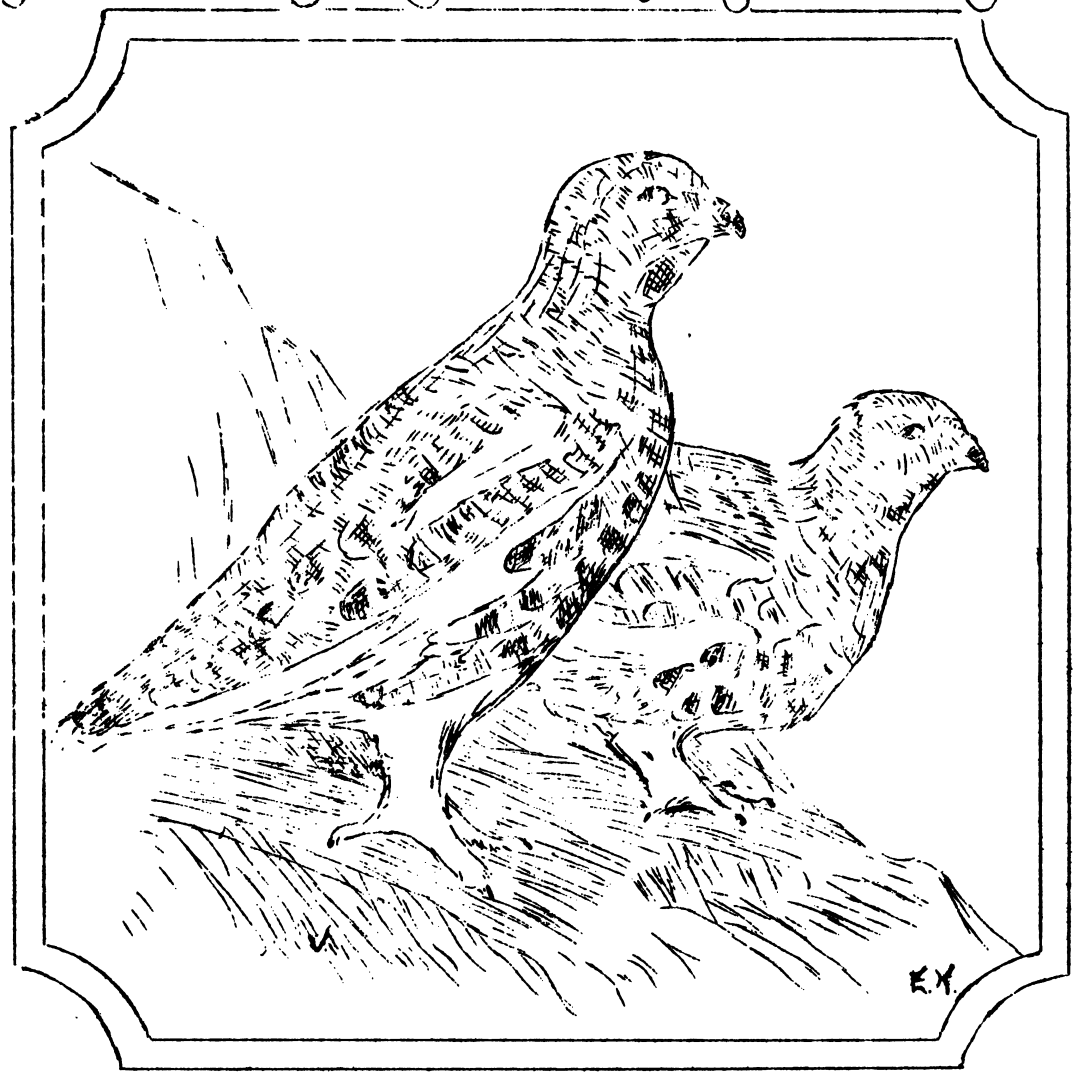
GLACIAL DRIFT

NOTES FROM GLACIER NATIONAL PARK



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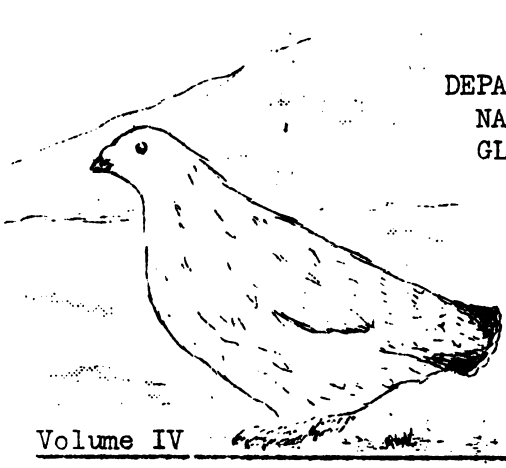

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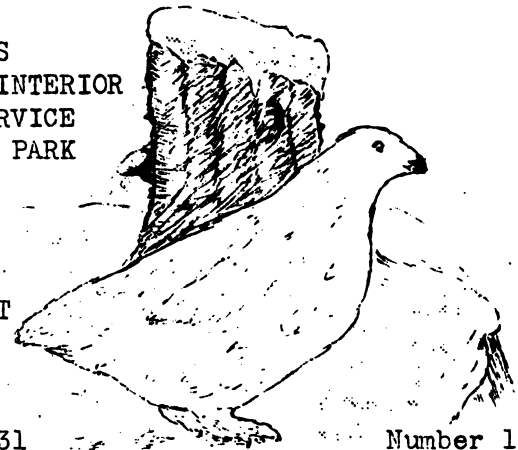
GLACIER NATIONAL PARK



GLACIAL DRIFT

Volume IV November, 1931 Number 11

A monthly pamphlet edited by the park naturalist and distributed by the Educational Division of Glacier National Park to all interested in the Park and its natural history.

Eivind T. Scoven, Park Superintendent Dr. G. C. Ruhle, Editor

"STUDY NATURE; NOT BOOKS." (Agassiz)

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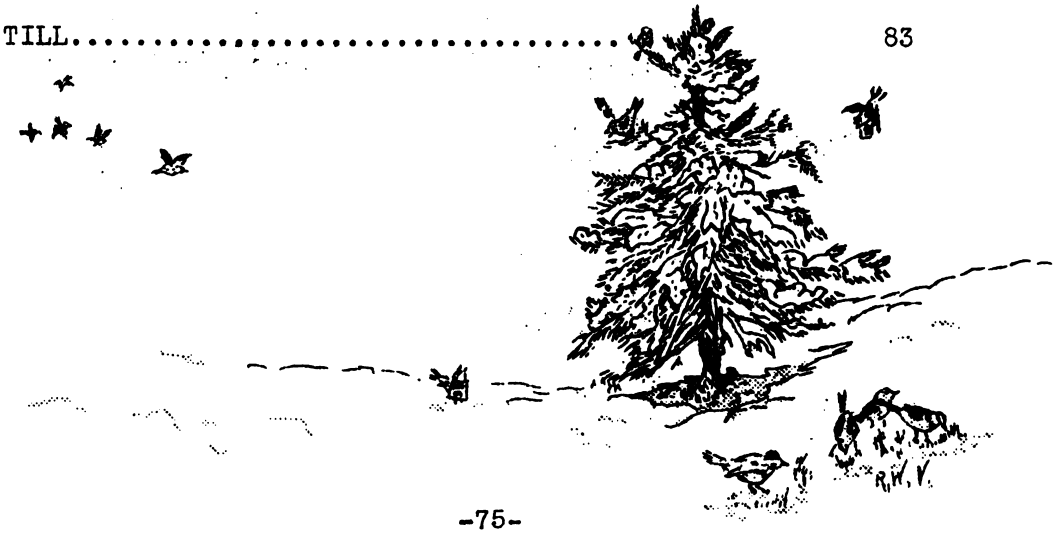

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RAMBLES ABOUT MOUNT SIYEH

Norman Clyde

In the morning, I had left Going-to-the-Sun Chalet and had followed the trail along the upper end of Lake St. Mary and thence up through a heavy growth of evergreen forest, consisting largely of Englemann spruce. This gave way to Arctic Fir, tall and spiry at first, but gradually dwindling in size until it formed low matted thickets as timberline was approached. Interspersed among these are beautiful meadows, spangled with many varieties of alpine flowers. On clear, sunny days of summer, these alpine meadows are delectable. The most thrilling of all, however, are the wonderful outlooks over valley and mountain.

When I reached Piegan Pass, slightly over 7,000 feet in elevation, I decided to remain several days and rove about in the neighboring mountains for there was wood and water at hand. Of these, Mt. Siyeh, 10,004 feet in elevation, rises to the northeast of the pass while to the west of it are Piegan and Pollock mountains, both very easily climbed and both commanding superb views. After suspending my knapsack out of reach of marmots and other too friendly rodents, I strolled up a grassy slope which soon gave way to one of loose scree, toward the summit of Piegan Mountain. A clamber up several hundred feet of argillite shelves brought me to its summit. The latter commands a striking view far down the crest to the south, and northward to the Canadian border, along the Livingston Range. Near at hand and especially prominent are the mass of high mountains about Gunsight Pass to the southwest; of the group about Logan Pass, particularly the spiry Mt. Reynolds; of the green, lake-dotted Swiftcurrent valley to the northeast and of the gray cirque-hollowed Mt. Siyeh to the northeast.

Wishing to enjoy the wonderful panorama and the delightful day as long as possible, I followed the ridge southward and scrambled up to the top of Pollock Mountain. There the prospect was much the same as that from the other peak, but had the advantage of being almost unobstructed to the north. In this direction especially conspicuous were the great perpendicular cliffs of Mount Gould and the Garden Wall and of the quiet verdant valley of the Swiftcurrent far below. To the west, the stately Heaven's Peak caught the evening rays of the sun on its glistening summit. To the north was the broad basin of Flattop Mountain with alternate stretches of green meadow and dark conifer forest, which sloped up to the ranges on either side of it. At its northern extremity is Kootenai Pass from which the Little Kootenai flows to Waterton Lake on the Canadian border. The long shadows extending from the peaks across the upper levels were rapidly lengthening and although it was delightful to wander about the mountain summits they are not the most pleasant places in which to pass the night without food and shelter, so I hastily descended the peak, except for an

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occasional stop to observe a number of wild goats that had come down from the cliffs and were browsing in the upper pasture, their white forms showing for a long distance.

Upon arriving at camp, wood and water were secured, a meal prepared, and a sheltered nook in a clump of alpine fir on the lee of a rock was chosen as a place in which to bivouac for the night. In this spot the rodent family seemed very solicitous that a camp should not be without frequent visits. During the day, marmots and ground squirrels were constantly watching for an opportunity to raid it and at night woodrats careened across one's sleeping bag in quest of anything edible, apparently indifferent as to whether it be a piece of cheese or a strand of rope.

In the morning, I went along a ridge leading toward the summit of Mt. Siyeh. The weather was delightful. The sun shone brightly, a sky of lovely azure over-arched the mountain; the air was wonderfully exhilarating. To the left was a cirque cut far back into the mountain. Occasionally there was an interesting scramble up ledges of limestone and argillite. These surmounted, a long scree-covered slope led to the summit. Just to the east of it the mountain breaks away into a precipice, four thousand feet in height, forming the black wall of huge cirque. Clinging to its lower portion is a small glacier and below it, the turquoise Cracker Lake. Perhaps the most striking feature of Glacier Park is the number and size of its cirques and one of the finest of all is this one on Mt. Siyeh. Fully half of the mountain seems to have been cut away. Standing, as it does, to the east of the main crest, it affords a magnificent view of them from a flanking position. To the east the great fault scarp drops to the green plains that sweep away to the distant horizon. As I chanced to glance down toward the rocks at the base of the cairn I saw a tiny shrew dart among them and vanish in a crevice. Its occurence accounted for the gnawed paper registers found in open cases on peaks of similar elevation.

Returning to camp, I spent another night in the nook under the rock and in the morning set out on the trail leading to Swiftcurrent Valley. On the way, however, I diverged from it and swinging along through alpine meadows and past thickets of stunted fir, I came to the base of Allen Mountain, which I climbed. Northwestward from it there is an extremely fine view of the great cirques of Mt. Siyeh; eastward and north of the high cliffs of Mt. Gould and the wonderfully spectacular Mt. Wilbur, Merritt, and Cleveland. On the return, I passed a small lake whose bottom is composed of red slate which glows bright through the water, except where it is deepest. I then returned to the trail and followed it down past the beautiful Morning Eagle Falls leaping over cliffs of argillite, through the flowery meadows below them, through spruce forest and glades to the border of Swiftcurrent Lake. There again I viewed the circle of mountains that never seem to weary one gazing upon them: Mt. Gould standing massive and reposeful near the head of the valley of Cataract Creek; Mt. Grinnell, with its bold pyramidal spur rising abruptly across Swiftcurrent Lake; and Mt. Wilbur towering grandly aloof, to the south of Swiftcurrent Creek.

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THE PARK BIRD

G.C. Ruhle, Park Naturalist

In a popular vote conducted twoyears ago, Glacier Park visitors chose the round-bodied, white-tailed ptarmigan as the Park bird.* Befitting it is that this is so, for this plump Arctic bird, embodying characteristics associated with this rugged mountain region, is well distributed throughout all higher elevations as a most interesting avian feature of an Arctic fauna.

The distribution of ptarmigan is circumpolar, extending southward only where high elevations sustain northern conditions at lower latitudes. It is thought that in balmier pre-pleistocene times, these birds were indigenous to northernmost lands only but that they were forced over southward by the aggravating chill of a growing Ice Age. As climates grew less severe, after the culmination of the most recent Ice Age, ptarmigan, with their associated life forms, followed in the wake of retreating ice masses, followed them up mountain flanks as well as northward, so that today they are found on the isolated little Alpine-Arctic islands which are the summits of our highest mountains scattered in a sea of warmer life zones.

Both northern and Montana species of ptarmigan migrate with changing seasons, but in a noteworthy fashion. It is known that the birds are strong fliers, since banded birds have been taken on islands separated by islandless seas several hundred miles from banding stations. Glacier's individuals are seen high near the mountain tops in summer, but on lower slopes in winter. Despite the fact that I have asked the rangers and many Park guests, no one could definitely remember of having ever seen a ptarmigan fly in Glacier Park. And in the tell-tale snowfall of early autumn, one can follow the tireless tread of these little walkers all bearing a general trend from the summer home. And so, one is led to believe that these birds perform their seasonal migrations walking most, if not all, of the way.

Ptarmigan undergo most interesting seasonal changes in plumage, having distinct patterns for summer, fall, and winter, but always there are found puzzling mixtures resulting from imperfect moults. In summer, the plumage of the well-groomed bird is barred, resembling somewhat the covering of the barnyard Plymouth Rock. In autumn, an intimate salt and pepper mixture is in vogue. In winter, the plumage is white and blends perfectly against a background of snow. This small grouse has legs completely feathered which serve as excellent snowshoes.

*Birds suggested for this poll included, beside the white-tailed ptarmigan, the osprey, water ouzel, varied thrush, leucosticte, pipit, redstart, winter wren, Arctic three-toed and pileated woodpeckers, chickadees, and nutcracker. Selected as park animal was the mountain goat; as park flower, the bear grass; as park tree, the Alpine or Lyall Larch.

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Besides the white-tailed variety, specimens of the larger willow ptarmigan have been seen and taken within Glacier Park. During winter, the latter bird has a black tail; its scarlet eye-combs appear prominent in the spring.

I n summer, the Park visitor sees ptarmigan in the high country only. The birds are very fearless; their appearance adds pleasure to an outing on horseback. Quite frequently, one becomes aware of their presence by their soft calling, but only good eyesight reveals the bird that blends so effectively into its surroundings.

I have been with many parties fortunate enough to come across a ptarmigan family in its Alpine home. The droll, downy chicks scurry hither and thither in interrupted progression, reeling as if to lose balance as they stop, and picking at plant seeds or bright objects. The mother hovers over them just like the barnyard hen, but without the aggressive attitude.

Among the myriad pleasures and thrills in the Park, I know of none more quiet and fascinating than to be permitted to stroke the confiding mother as she carefully broods her chicks and talks to them, or to watch this feathered mountaineer as she leads with precarious steps her Alpine brood on the surface of a glacier in search for food.

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A MARAUDING BEAR

R. W. Vincent.

The bears of Glacier are becoming bolder each year. During the early part of November a large, beautifully coated black bear raided the refrigerators of Headquarters residences, apparently having no difficulty in getting these refrigerators off the back porches out into the yards where it proceeded to eat the choice foods.

Coming to my house it opened the outward swinging screen door, opened the lower refrigerator door, pulled out the bag of lemons and pail filled with four dozen eggs, on which it proceeded to SIT while endeavoring to reach higher up for the T-bone steaks which were placed on an upper shelf. Park Engineer Randels, who lives next door, hearing the bear, rapped on his bedroom window, frightening Bruin so badly that in hurriedly leaving it didn't try to find the door again, but burst out through the screened side of the porch, leaving an egg-smeared paw mark on the rear kitchen door.

This was practically the last raid, all the bears disappearing for the winter very soon after.

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AN ENCOUNTER WITH AN ELK

Clyde Fauley, Park Ranger

To one who has had years of park ranger experience in one of the largest parks noted for its varied wild life, memory is rife with incidents and personal contacts with our wilderness friends--the bird and animal tribes.

The writer was stationed for years in the Paola District of Glacier National Park, a country where the wild life is living the natural way unhampered by the restrictions of human civilization, for the Paola District has no tourist travel as yet, and the deer, elk, mountain goat, black and grizzly bear are all found in goodly numbers while the colossal moose, the greatest deer that ever trod the earth, is steadily increasing. Incidentally, many folks believe that moose are blood-thirsty animals dangerous to man, but I have come to know that they are about as harmless as one could well imagine; indeed, the experiences I have had with the awkward moose proved that they were quite willing to attend to their own business.

But with the elk I have had at least one vivid encounter. In December, 1925, I had made a patrol in the Muir Creek Valley and was hiking down the brushy side-hill when I noticed a bull elk on the opposite slope who was intently gazing up the mountain side. As I had seen elk all through the timber that day, I gave no more attention to this one, having plenty of trouble in working my way through the heavy brush. About a minute later a crashing of brush several hundred yards off gave me the vision of that bull coming for me in no uncertain manner. Under the circumstances, I lost no time in getting up the nearest pine and was no more than out of reach when the elk stopped, practically under the tree in which I was settled. I had never before seen such a picture of animal ferocity and hate. His ears were laid back, his eyes were blazing, and he was gritting his teeth. I let him know I was up above him and the great antlered head swung upward and those deadly, malignant eyes were cast on me. Quickly the mad green light in them faded and the bull trotted off with a fool animal grin, if such a thing be possible. I am certain this bull elk had no intention of attacking a human being. A half mile above I had noted where several bulls had been fighting recently. The combatants had torn up the ground and trampled many saplings over. Doubtless this huge bull had been the victor; and, as I was making quite a racket pushing through the thick brush, he got the idea that the other elk was returning to resume the battle.

Another time I was travelling down this same valley and decided to go over the crest of Riverview Mountain in returning home in preference to going around and down the rugged canyon. And from the floor of that valley to the top of the mountain a bald eagle accompanied me, a matter of over an hour. He would soar just above me and alight upon a scrub pine and when I would get within a few yards of his tree, the eagle would fly on up the mountain another few hundred yards and repeat the performance. This was very interesting, but another incident with a large bird was not so amusing and for a few moments was positively uncanny.

In 1924, when the Park was putting forth every effort to find the missing Whitehead brothers, I received a telephone call from headquarters

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to look over the Park Creek country. I left the Paola Ranger Station in the afternoon; and, as I intended to make as quick a trip as possible, I went real light, carrying no blankets--only a light axe and grub, hoping to make Lake Isabel, 22 miles distant. I made my destination in good time and set out before a small campfire that night on the wonderful shores of Lake Isabel, a mountain-framed lake in a wild setting. Dozing off to sleep around ten o'clock I was awakened suddenly by the peculiar swish of giant wings as a great owl swung down over my head and alighted not ten yards from my campfire. To get the real effects of this winged apparition, imagine yourself camped out alone in front of a dwindling campfire in a high weird mountain basin hemmed in on three sides by giant peaks.

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FOREST FIRE STARTED BY FRICTION

There has been a vast amount of discussion as to whether or not it is possible for a forest fire to start from the friction of two trees rubbing together. It has often been argued that a fire could not start in this manner without human aid.

However, while on an inspection trip with Superintendent Scoyen and Assistant Superintendent Vincent, we saw evidence that proves conclusively that a fire can start in the woods by friction without the aid of man. On the trail between Bowman and Quartz Lakes, between the foot of Bowman Lake and the top of Quartz Ridge, we saw a dead spruce tree with a forked top that had fallen against a larch. The spruce was still fastened to the ground by some of its roots and its forked top had fallen astride the larch so that when swayed by the wind, friction under considerable pressure was set up between the two trees. This had happened many years ago; the bark was worn from the trunk of each tree where it came in contact with the other and the bare trunks were touching. Each tree was about 14 inches in diameter at the base.

Sometime during recent years, possible the last two or three, a fire had been started where the two trees rubbed together. It was evidently soon extinguished as there was no fire scar on the ground or anywhere else nearby, yet the fork and trunk of the spruce were charred for a distance of six feet each way from where the two trees came in contact. The larch, a living tree, was badly charred where the crotch of the spruce rested against it. This is absolute proof that a fire can be started in this way, and is no doubt the answer as to how some of our unexplained forest fires in the past have started.

As I visualize it, here is what actually happened: During a spell of very dry weather a storm came up and the wind blew violently for a short time before it started raining. The friction between the swaying trees ignited the pitchy, resinous tinder created by the grinding tree trunks about the time the rain started. So, as the cinders and pieces of burning bark fell to the ground they were extinguished by the rain, and finally it rained hard enough to put out the fire that was burning in the trunks of the trees.

-- Geo. N. Paige, Fire Chief

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DISCOVERY OF MARIAS PASS

From the Helena Daily Independent, Sunday, May 15, 1931

Sidney M. Logan

When we say that John F. Stevens discovered the pass now occupied by the Great Northern Railway and the U. S. Montana Highway No. 2, we use the word in restricted sense, that is the discovery of a pass suitable for the construction of a railroad.

It is possible, in fact extremely probable, that many white men crossed and recrossed the main range along the present line of the Great Northern Railway before Stevens made his discovery. Trappers, hunters, prospectors doubtless camped, in the early part of the last century, on the very spot where Stevens spent the night of December 10, 1889. Blackfeet and Piegans on one side, Kootenais, Flatheads and Nez Perces on the other, doubtless met at this very point and made the surrounding hills echo to their war whoops, the twang of their bows and the hissing flight of their arrows -- but that is not discovery. No record was left to posterity, no observations made, no altitudes taken, and the secret of the pass, so far as railroads were concerned, remained hidden until December, 1889. It has never been claimed that Stevens made the discovery except in the sense above qualified.

Agnes C. Laut in her splendid narrative "The Blazed Trail of the Old Frontier," recording the facts and incidents of the ceremony with which the monument to Stevens at Summit was dedicated, in July, 1925, says:

"Why was Marias Pass -- the easiest and best route by the Northern Rockies-- not discovered and opened 'til our day? The Flatheads knew it. Their deep rutted pony trail is marked to this day. The Blackfeet knew it. It was here they battled to keep the mountain tribes from getting across to procure firearms from the fur traders of the Upper Missouri. Bridger, the old trader of Edmonton and Fort Union must have known of it. Meriwether Lewis saw its entrance and guessed it was there. Governor Isaac Stevens in his great survey, 1853 - 1854, Tinkham and Doty, his assistants, knew there was such a pass, but missed it by a few miles and got entangled in the Cut Bank trail, which was impracticable for steel rails."

In the nature of things credit for discoveries, historically, can go to those only who have intelligently explored for definite purpose and who have handed down a record of their work. Wandering whites, hunters and trappers may have, probably did, see the Rocky Mountains before La Verendrye discovered them -- white men may have camped on the site of Fort Astoria before Lewis and Clark erected their winter quarters there or before Captain Gray pushed the prow of his ship into the mouth of the Columbia -- white men may have anticipated David Thompson in the actual view of Flathead Lake -- many men may have walked over the outcrop of the Comstock Lode before it was really discovered, but their knowledge died with them. All explorers, Asiatic, African, and American, have utilized the superficial and transcient knowledge of men, civilized and savage, to aid them

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in their work of discovery. Every western exploration party had its guides - Freemont had his Kit Carson; Lewis and Clark had their Sacakawea; David Thompson, the super explorer and geographer of the Northwest, availed himself on all occasions of the benefit of local knowledge possessed by Indian and trapper; and so with LaSalle, DeSoto, Mackenzie, and that great army of captains that won the continent for civilization.

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The November Cover - The original sketch of these two ptarmigan is the work of Eugene Kingman of Providence, Rhode Island, who is a student of the Yale Art School, and who was on the naturalist staff of the past summer. (GLACIAL DRIFT, IV, 45).

TILL

Tin-canned Skunk - Who spanked the bear? Who will put a bell on the cat? Such questions are snaps compared with "Who tied the can on the pole-kitty's dangerous tail?" It was current in a residential district of the Park when one morning it was seen to be the plight of a skunk who had unceremoniously taken its abode in the neighborhood with much apparent satisfaction to itself, much apparent dissatisfaction to the residents. With shiny can rattling after it, kitty stopped ever and anon to flip up tail with can, trying to scare off the unknown annoyer. Once having shaken off the can, kitty remains in her favorite haunts. Her persistence has won over her human enemies to an appreciative regard and a more or less friendly relation exists, 'tho who would not fear her offence if she were met in open combat? At present "all is quiet" on the lakeside front.

Chas. L. Croghan, Asst. Chief Ranger

Ever Popular Feed Rack - Since the first cold weather of this month the various bird feed racks are again busily occupied. We put suet in our feed box and in less than ten minutes the first visitor, a Clark's Nutcracker had arrived to feed. The usual winter visitors come to feed; Canada jays, Rocky Mountain blue jays, Clark's Nutcrackers, both chestnut-backed and long-tailed Chickadees, also Downy and Hairy Woodpeckers.

A Late Visitor - On November 13th a lone Varied Thrush was gleaning morsels from around the deer feed box in the rear yard. These shy birds are the first of the summer birds to return to us in the spring.

R.W.V.

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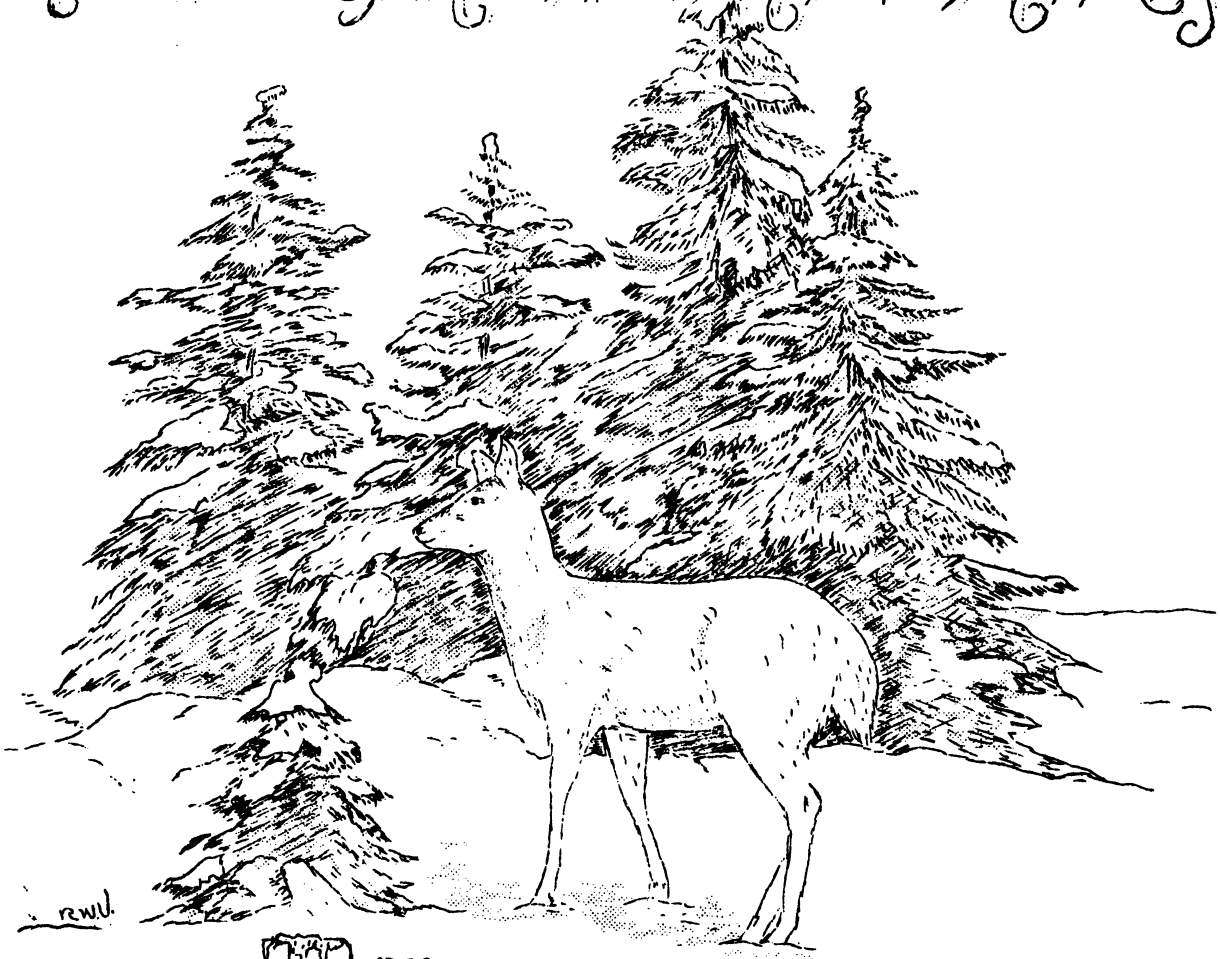
GLACIAL DRIFT

NOTES FROM

GLACIER NATIONAL PARK



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UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
GLACIER NATIONAL PARK

GLACIAL DRIFT

Volume IV December, 1931 Number 12

A monthly pamphlet edited by the Park Naturalist and distributed by the Educational Division of Glacier National Park to all interested in the Park and its natural history.

Eivind T. Scoyen, Park Superintendent Dr. G. C. Ruhle, Editor

"STUDY NATURE; NOT BOOKS." (Agassiz)

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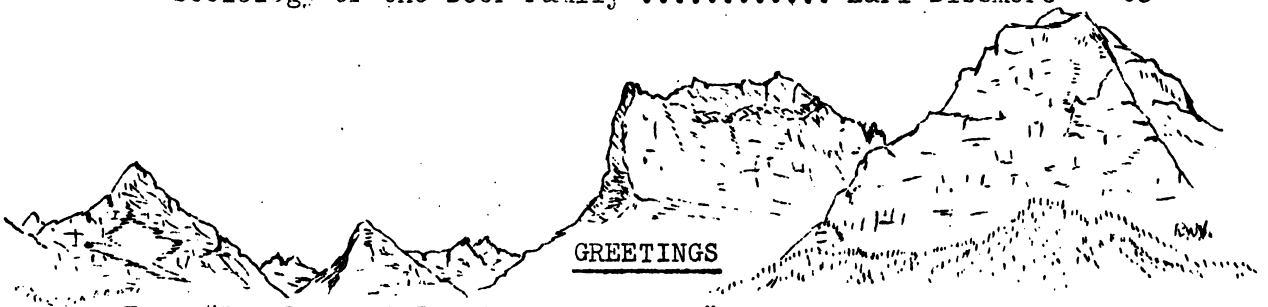

GREETINGS

From "The Land of Shining Mountains" the entire organization of Glacier National Park, which produces Glacial Drift, send Christmas Greetings to our readers and friends everywhere. We only hope that the happiness, joy, and spirit of the holiday season will be with you the entire year.

E. T. Scoyen

E.T. Scoyen
Superintendent

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AN ENCOUNTER WITH AN ELK

Clyde Fauley, Park Ranger

To one who has had years of park ranger experience in one of the largest parks noted for its varied wild life, memory is rife with incidents and personal contacts with our wilderness friends--the bird and animal tribes.

The writer was stationed for years in the Paola District of Glacier National Park, a country where the wild life is living the natural way unhampered by the restrictions of human civilization, for the Paola District has no tourist travel as yet, and the deer, elk, mountain goat, black and grizzly bear are all found in goodly numbers while the colossal moose, the greatest deer that ever trod the earth, is steadily increasing. Incidentally, many folks believe that moose are blood-thirsty animals dangerous to man, but I have come to know that they are about as harmless as one could well imagine; indeed, the experiences I have had with the awkward moose proved that they were quite willing to attend to their own business.

But with the elk I have had at least one vivid encounter. In December, 1925, I had made a patrol in the Muir Creek Valley and was hiking down the brushy side-hill when I noticed a bull elk on the opposite slope who was intently gazing up the mountain side. As I had seen elk all through the timber that day, I gave no more attention to this one, having plenty of trouble in working my way through the heavy brush. About a minute later a crashing of brush several hundred yards off gave me the vision of that bull coming for me in no uncertain manner. Under the circumstances, I lost no time in getting up the nearest pine and was no more than out of reach when the elk stopped, practically under the tree in which I was settled. I had never before seen such a picture of animal ferocity and hate. His ears were laid back, his eyes were blazing, and he was gritting his teeth. I let him know I was up above him and the great antlered head swung upward and those deadly, malignant eyes were cast on me. Quickly the mad green light in them faded and the bull trotted off with a fool animal grin, if such a thing be possible. I am certain this bull elk had no intention of attacking a human being. A half mile above I had noted where several bulls had been fighting recently. The combatants had torn up the ground and trampled many saplings over. Doubtless this huge bull had been the victor; and, as I was making quite a racket pushing through the thick brush, he got the idea that the other elk was returning to resume the battle.

Another time I was travelling down this same valley and decided to go over the crest of Riverview Mountain in returning home in preference to going around and down the rugged canyon. And from the floor of that valley to the top of the mountain a bald eagle accompanied me, a matter of over an hour. He would soar just above me and alight upon a scrub pine and when I would get within a few yards of his tree, the eagle would fly on up the mountain another few hundred yards and repeat the performance. This was very interesting, but another incident with a large bird was not so amusing and for a few moments was positively uncanny.

In 1924, when the Park was putting forth every effort to find the missing Whitehead brothers, I received a telephone call from headquarters

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to look over the Park Creek country. I left the Paola Ranger Station in the afternoon; and, as I intended to make as quick a trip as possible, I went real light, carrying no blankets--only a light axe and grub, hoping to make Lake Isabel, 22 miles distant. I made my destination in good time and set out before a small campfire that night on the wonderful shores of Lake Isabel, a mountain-framed lake in a wild setting. Dozing off to sleep around ten o'clock I was awakened suddenly by the peculiar swish of giant wings as a great owl swung down over my head and alighted not ten yards from my campfire. To get the real effects of this winged apparition, imagine yourself camped out alone in front of a dwindling campfire in a high weird mountain basin hemmed in on three sides by giant peaks.

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FOREST FIRE STARTED BY FRICTION

There has been a vast amount of discussion as to whether or not it is possible for a forest fire to start from the friction of two trees rubbing together. It has often been argued that a fire could not start in this manner without human aid.

However, while on an inspection trip with Superintendent Scoyen and Assistant Superintendent Vincent, we saw evidence that proves conclusively that a fire can start in the woods by friction without the aid of man. On the trail between Bowman and Quartz Lakes, between the foot of Bowman Lake and the top of Quartz Ridge, we saw a dead spruce tree with a forked top that had fallen against a larch. The spruce was still fastened to the ground by some of its roots and its forked top had fallen astride the larch so that when swayed by the wind, friction under considerable pressure was set up between the two trees. This had happened many years ago; the bark was worn from the trunk of each tree where it came in contact with the other and the bare trunks were touching. Each tree was about 14 inches in diameter at the base.

Sometime during recent years, possible the last two or three, a fire had been started where the two trees rubbed together. It was evidently soon extinguished as there was no fire scar on the ground or anywhere else nearby, yet the fork and trunk of the spruce were charred for a distance of six feet each way from where the two trees came in contact. The larch, a living tree, was badly charred where the crotch of the spruce rested against it. This is absolute proof that a fire can be started in this way, and is no doubt the answer as to how some of our unexplained forest fires in the past have started.

As I visualize it, here is what actually happened: During a spell of very dry weather a storm came up and the wind blew violently for a short time before it started raining. The friction between the swaying trees ignited the pitchy, resinous tinder created by the grinding tree trunks about the time the rain started. So, as the cinders and pieces of burning bark fell to the ground they were extinguished by the rain, and finally it rained hard enough to put out the fire that was burning in the trunks of the trees.

-- Geo. N. Paige, Fire Chief

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DISCOVERY OF MARIAS PASS

From the Helena Daily Independent, Sunday, May 15, 1931

Sidney M. Logan

When we say that John F. Stevens discovered the pass now occupied by the Great Northern Railway and the U. S. Montana Highway No. 2, we use the word in restricted sense, that is the discovery of a pass suitable for the construction of a railroad.

It is possible, in fact extremely probable, that many white men crossed and recrossed the main range along the present line of the Great Northern Railway before Stevens made his discovery. Trappers, hunters, prospectors doubtless camped, in the early part of the last century, on the very spot where Stevens spent the night of December 10, 1889. Blackfeet and Piegans on one side, Kootenais, Flatheads and Nez Perces on the other, doubtless met at this very point and made the surrounding hills echo to their war whoops, the twang of their bows and the hissing flight of their arrows -- but that is not discovery. No record was left to posterity, no observations made, no altitudes taken, and the secret of the pass, so far as railroads were concerned, remained hidden until December, 1889. It has never been claimed that Stevens made the discovery except in the sense above qualified.

Agnes C. Laut in her splendid narrative "The Blazed Trail of the Old Frontier," recording the facts and incidents of the ceremony with which the monument to Stevens at Summit was dedicated, in July, 1925, says:

"Why was Marias Pass -- the easiest and best route by the Northern Rockies-- not discovered and opened 'til our day? The Flatheads knew it. Their deep rutted pony trail is marked to this day. The Blackfeet knew it. It was here they battled to keep the mountain tribes from getting across to procure firearms from the fur traders of the Upper Missouri. Bridger, the old trader of Edmonton and Fort Union must have known of it. Meriwether Lewis saw its entrance and guessed it was there. Governor Isaac Stevens in his great survey, 1853 - 1854, Tinkham and Doty, his assistants, knew there was such a pass, but missed it by a few miles and got entangled in the Cut Bank trail, which was impracticable for steel rails."

In the nature of things credit for discoveries, historically, can go to those only who have intelligently explored for definite purpose and who have handed down a record of their work. Wandering whites, hunters and trappers may have, probably did, see the Rocky Mountains before La Verendrye discovered them -- white men may have camped on the site of Fort Clatsop before Lewis and Clark erected their winter quarters there or before Captain Gray pushed the prow of his ship into the mouth of the Columbia -- white men may have anticipated David Thompson in the actual view of Flathead Lake -- many men may have walked over the outcrop of the Comstock Lode before it was really discovered, but their knowledge died with them. All explorers, Asiatic, African, and American, have utilized the superficial and transcient knowledge of men, civilized and savage, to aid them

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in their work of discovery. Every western exploration party had its guides - Freemont had his Kit Carson; Lewis and Clark had their Sacakawea; David Thompson, the super explorer and geographer of the Northwest, availed himself on all occasions of the benefit of local knowledge possessed by Indian and trapper; and so with LaSalle, DeSoto, Mackenzie, and that great army of captains that won the continent for civilization.

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The November Cover - The original sketch of these two ptarmigan is the work of Eugene Kingman of Providence, Rhode Island, who is a student of the Yale Art School, and who was on the naturalist staff of the past summer. (GLACIAL DRIFT, IV, 45).

TILL

Tin-canned Skunk - Who spanked the bear? Who will put a bell on the cat? Such questions are snaps compared with "Who tied the can on the pole-kitty's dangerous tail?" It was current in a residential district of the Park when one morning it was seen to be the plight of a skunk who had unceremoniously taken its abode in the neighborhood with much apparent satisfaction to itself, much apparent dissatisfaction to the residents. With shiny can rattling after it, kitty stopped ever and anon to flip up tail with can, trying to scare off the unknown annoyer. Once having shaken off the can, kitty remains in her favorite haunts. Her persistence has won over her human enemies to an appreciative regard and a more or less friendly relation exists, 'tho who would not fear her offence if she were met in open combat? At present "all is quiet" on the lakeside front.

Chas. L. Croghan, Asst. Chief Ranger

Ever Popular Feed Rack - Since the first cold weather of this month the various bird feed racks are again busily occupied. We put suet in our feed box and in less than ten minutes the first visitor, a Clark's Nutcracker had arrived to feed. The usual winter visitors come to feed; Canada jays, Rocky Mountain blue jays, Clark's Nutcrackers, both chestnut-backed and long-tailed Chickadees, also Downy and Hairy Woodpeckers.

A Late Visitor - On November 13th a lone Varied Thrush was gleaning morsels from around the deer feed box in the rear yard. These shy birds are the first of the summer birds to return to us in the spring.

R.W.V.

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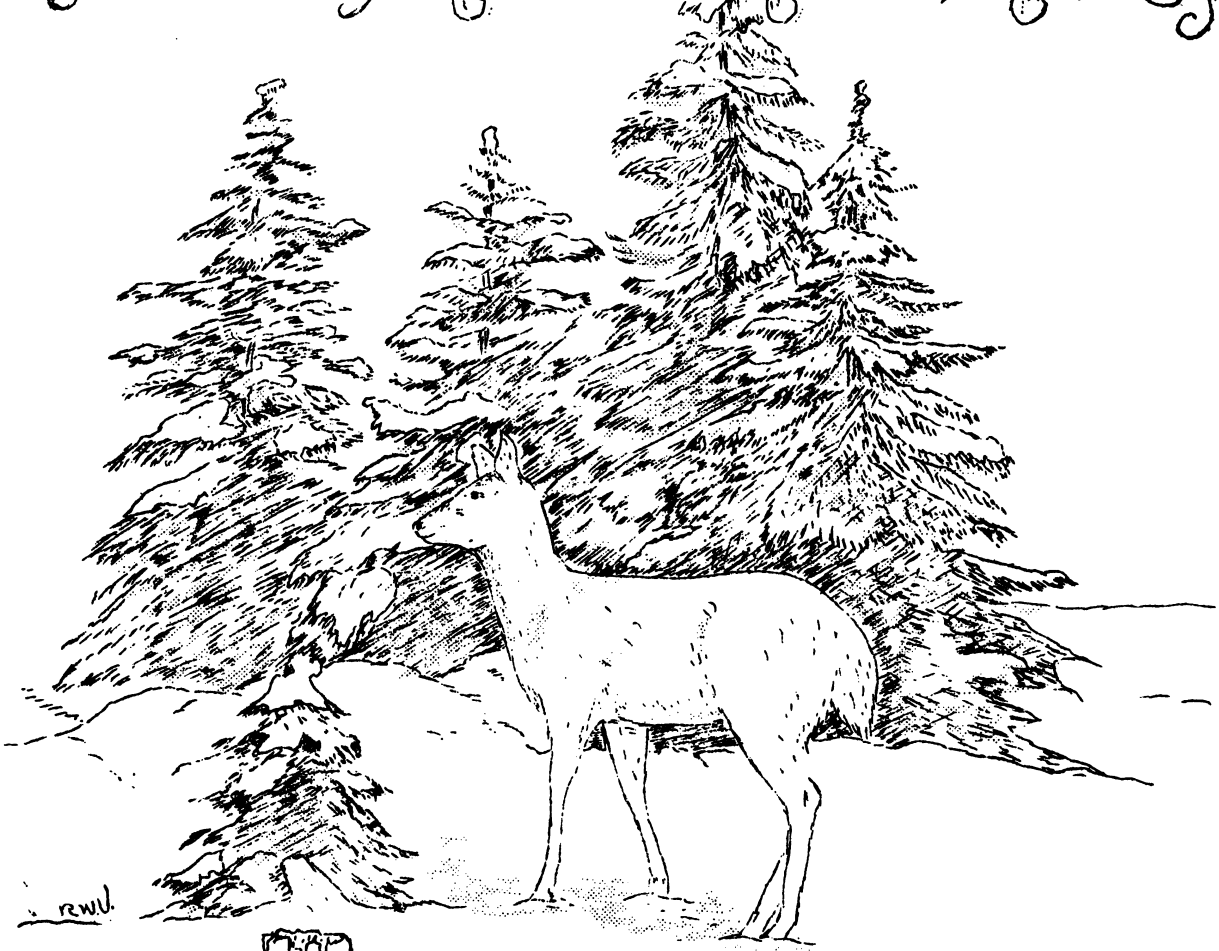

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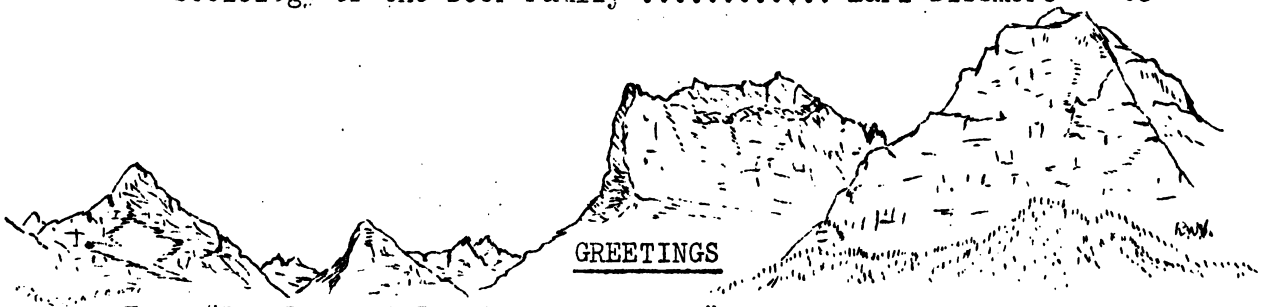

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E. T. Scoyen

E.T. Scoyen
Superintendent

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WEE BABES OF THE WOODS

Ray Rundell, Clerk

A tiny brown streak across the pathway ahead of us caused my companion and I to halt our brisk walk down Cameron Lake Trail and examine the sticks and leaves along the trail side. We looked the ground over carefully but could see no signs of the object which had attracted our attention.

As we were about to proceed on our way, two tiny brown four legged animals about twice as large as a lead pencil and four or five inches long crossed the trail making the same apparition we had previously seen.

Apparently thinking themselves safe upon reaching the base of an old log, they stopped and watched us with their black pinhead eyes. Soon another tiny head popped up over the edge of a fallen branch of a tree. He was number one of the furry trio.

"Baby weasels!" we simultaneously exclaimed in stage whispers. "Where's my kodak!" But when we again looked for our camera quarry there was nothing but the usual forest ground covering to be seen.

These little animals are the smallest of the marten family and the species known as the Least Weasel, found from the Saskatchewan to Alaska, are the smallest carnivora in the world. Full grown weasels are no larger in circumference than a man's thumb. Their legs are very short and far apart, and they are of such great length that they are positively snake-like in proportions. It is odd to see their front legs walk to and fro quite independent of the hind quarters.

These tiny beasts are brown in the summer and white in the winter, changing color to fit their surroundings, which is nature's help in securing their subsistence and also for protection.

They obtain food by killing animals, sometimes ten or twelve times their size. Once they are able to sink their needle-pointed teeth into luckless victims they never loosen their grip until the life blood of their prey has been obtained.

If these little savages can be induced to stay around cabins and ranger stations, they are welcome allies in the war on rats and mice.

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SCRAMBLES IN THE MOUNTAINS ABOVE BOWMAN LAKE

Norman Clyde

Heavy clouds, the wake of a storm of several days duration, were still hanging over the mountains as a friend and I took the trail along the north side of Bowman Lake on our way to the mountains at its head. This trail wound through a heavy forest composed chiefly of fir, spruce, and cedar, affording numerous glimpses of the broad, beautiful lake a short distance below and occasional vistas of Rainbow Peak and several others that rose a mile above, piercing at intervals through a shifting robe of sun-suffused clouds. It continued through the forest for several miles above the lake and then began to climb the steep slope of the mountains. The lake was some thousands of feet below, flowery meadows graced the declivities, magnificent views of waterfalls, cirques, glaciers, and peaks were constantly unfolded to us, while the lake lay a shining sheet of silver bordered by dark forest-covered mountain slopes. At length the trees dwindled in size, the meadows became more extensive, the views of the nearby mountains more magnificent. We stood on Brown's Pass, thrilled by the beauty and sublimity of the scene.

As we intended to do some climbing, we decided to begin that afternoon by ascending a somewhat precipitous mountain immediately south of the pass. After rising a thousand feet, the more difficult portion of the peak was encountered. When we had crossed a small glacier we pursued a zig zag course over ledges of limestone and argillite and a belt of igneous rock--wherever a feasible route could be found. Much to our disappointment, however, when about two hundred feet below the summit, heavy fog swept over it, and as we scrambled to the top of the narrow ridge which forms the highest point one could see only a few rods through the enveloping mass of vapor. After erecting a cairn of shaly rock we began the descent, arriving at the pass during the evening.

Camp was made on a grassy slope down which several small brooks stole through a scattering growth of dwarfed alpine fir. It commanded an excellent view of the neighboring mountains, cirques, and glaciers which in shifting clouds and changing light were a continual source of fascination. The next morning, Chapman Peak, an easily climbed mountain 9315 feet in elevation and just north of the pass, was ascended. In fair weather it commands a wonderfully extensive panorama of the Park and far up into the Canadian Rockies, but on this occasion the prospect from it was obscured by dense masses of clouds that floated about over the mountains. However, there were good views of the nearby ones, particularly of the extremely rugged Kintla group a few miles westward and of the Boundary Mountains just north of them, across the Kintla Valley.

That night the storm broke in earnest and the Sierra Club of California with whom we were camped awoke in the morning to see the ground white with several inches of snow, heavy clouds hanging low overhead and

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rain falling copiously. During the afternoon, the clouds broke away to some extent so that we made our way to the crest of the ridge running north eastward from Chapman Peak until a small peak projecting from it was surmounted. Heavy clouds loomed low over the mountains giving them a certain sublimity as they rolled and shifted about the peaks. It was useless, however, to attempt an ascent of one of the higher ones as we had thought of doing, since the outlook would be entirely obscured. We followed a diagonal line of descent down the mountainside abounding in high ledges. The grotesque antics of several ancient looking wild goats that hurried along them were very amusing. Very inspiring was the view of white, cascading streams that resounded in their course down the slopes of a cirque, meandered along its verdent floor, vanished underneath the ground and eventually emerged some distance below from an aperture in the face of a limestone cliff in a snowy cataract that leaped for perhaps a hundred feet down the sheer wall and then continued its bounding course to the green forested valley thousands of feet below. The Hole-in-the-Wall Falls, as they are called, are very unique and picturesque phenomenon caused by a passage being dissolved through a portion of a massive stratum of limestone.

On the following morning the storm had passed. The sky was of deepest azure and in it floated a few masses of fleecy clouds. Camp was moved that day to Waterton Lake but I and my friend decided to have another scramble before leaving this most interesting region. One of the Guardhouse group south of the pass was selected, as it seemed to offer a good climb and an excellent view. A route was outlined up the ledges that extend horizontally across its steep front. After following the trail for a short distance we hung our knapsacks on an alpine fir, swung along a ridge and across some rough morainal material to Logan Glacier which was easily traversed except along its steep upper slope where it was necessary to cut steps for some distance in order to reach the top of a vertical cliff. Having done so, we pursued a somewhat devious course up the face of the mountain to the crest of a ridge about 1500 feet below the summit. Here a line of pinnacles blocked a direct approach to the highest point so that we were obliged to proceed diagonally upward over argillite shelves to it. There a magnificent view awaited us. The atmospheric conditions were almost perfect and the panorama displayed in every direction was one of amazing beauty and grandeur. Eastward one gazed across mountain and valley at the giant group consisting of Mts. Cleveland, Merritt, and other peaks; southward along the detached and stately mountains of the Livingstone Range and the broad basin of Flattop Mountains stretching eastward from them; westward toward the nearby Carter and Rainbow Peaks down whose steep flanks crept a glacier creased by great numbers of crevasses; north westward, at the imposing masses of Kintla and Boundary Mountains.

The prospect was so sublime and the day such a delectable one that we consumed a considerable amount of time scanning the mountains, photographing them, and in building a cairn out of the loose slabs of argillite that lay scattered about on the narrow summit. But the lengthening

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afternoon shadows warned us that if we were to reach camp -- some ten miles from the base of the mountains -- we must be going. We descended the mountain and followed the trail down several thousand feet farther into a tall dense conifer forest. We passed beautiful lakes of turquoise and azure hues nestling calm beneath lofty cliffs, and surrounded by deep forests. The bold fronts of the mountains glowed in the golden light of sunset and after the long northern twilight, darkness brooded over them. The trail led on down the wooded valley, ending eventually at Waterton Lake, where we reached camp some time after nightfall.

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HOW THE HORSE CAME TO THE BLACKFEET*

Sidney M. Logan

He was an Indian of full-blood, beaded, buckskinned, blanketed, and eagle feathered from his scalp-lock to his moccasins. The traces of vermillion across his features betokened amity and good will. The pigments that denoted hostility and warfare were absent. When he spoke it was not in the language of his tribe, but in English, as pure as that at the command of the average pale face. The tipi was pitched and the campfire kindled on the shores of a lake, the waves of which lapped the feet of Rising Wolf Mountain. Across the lazily curling smoke of the willow fire I shot my question: "How did the horse first come to the Blackfeet?"

"Long in the past," he said, "before the oldest living member of our tribe knew a warrior old enough to have a personal recollection of the event, the horse came to the Blackfeet. A young man who had gone on an expedition in search of game was sitting by his lonely campfire, such a one as this now burning between us. In the twilight, while the smoke of the campfire curled upwards, he saw sitting opposite him, just as you are now sitting opposite me, a beautiful maiden. Whence she came, what her tribe, what her mission, the young warrior did not know, but he did grasp the full consciousness that this was the woman that the Great Spirit intended should be his companion for life. These sentiments he communicated to the maiden and she replied, "If you want me, you must find me. I go now, but you will find me at the end of a winding trail. That trail you must seek out yourself." With these words she vanished.

"The following day the young man returned to the tipi of his people laden with game. He did not linger by the campfires of the village, but promptly made his preparations for a long journey. These completed, he started across the prairie armed with his bow of red birch, his quiver full of arrows. For days he traveled, sometimes across scorching prairies, sometimes knee deep in the lush grass of meadows, sometimes following the winding channels of mountain streams, sometimes scaling and descending snow-mantled peaks.

"One night he came to a lonely tipi pitched in a narrow valley high up on the side of a mountain where the black alders mingled with the trees of pines and fir and spruce, where rocky escarpments hedge the valley on every side but one. Pulling back the flap of the tipi, the young warrior entered and there a strange sight met his eyes. Seated by the fire was a man whose seamed and lined features and snowy hair seemed to have recorded the passage of centuries. No man in the village of the young warrior seemed as venerable as the one he now confronted. Circling the fire were dozens of buffalo horns, their tips penetrating the ground,

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the butt ends facing the fire. Following the time honored custom of his people, the young man stood silently, waiting for the elder to speak. Presently the filmed eyes of the old man turned toward the intruder and he spoke: 'Many days I have waited for you, my son. Your journey has been a hard one, but you have many weeks of toil ahead of you. I know your mission and I will help you. Rest tonight in this tipi and tomorrow I will start you on your way.'

"The following morning the old man took two buffalo horns from the circle saying: 'You may now continue your quest. Take these buffalo horns, there will come a time when they will prove supremely useful to you. One day you will come to a mountain whose summit you cannot see. Its wall rises vertically from the surrounding prairie, its peak pierces the blue dome above. When you come to this mountain, take a buffalo horn in each hand and make the ascent by pushing the horns into the side of the mountain and lifting yourself thereby until you have reached the top. At the summit you will see a vast plain spread out before you. Cross this plain and you come to the tipi of an old woman. Enter the tipi and there you will receive further instructions.'

"After many days of toilsome travel the young Indian came to the foot of the mountain. Up the side of the cliff he went hand over hand, using the buffalo horns alternately as directed by the venerable Indian. Reaching the summit, he traveled for many days, finally coming to the tipi of the old woman. This he entered and stood silently waiting for the old woman to speak. Finally she said: 'I know your mission, rest here tonight and on the morrow you will reach the village where the young woman lives. Her father is fierce of countenance and stormy of words. He will threaten your life and the outcome will depend entirely on your courage. Stand up to him bravely and all will be well. Show the least fear and your mission will end in disaster.'

"The young warrior did as directed. Approaching the village he entered boldly. A young Indian boy directed him to the tipi of the chief. He had scarcely reached the door of the tipi when his ears were assailed by a fierce and strident voice. Coming to the door the chief drew his bow, presenting an arrow at the heart of the young Indian, told him he was about to die, reviled him in fierce language, but the young man stood firm, not a muscle trembled. His own level eyes met those of the chief unafraid. For a moment they thus stood. At last the old man lowered his bow and said: 'You are worthy to carry a gift to your people, a gift that will change the course of their lives. No longer will they skulk afoot in the coulees of the prairie, on the passages of the mountains, seeking their food among the lower animals -- no longer will they be compelled to surround the buffalo and drive them over the cliffs to secure their winter's food. I will give them new means of traveling and hunting with which they will move swiftly here and there. They will ride up along side of the buffalo and drive their arrows into their bodies while they are in full flight. You shall take my daughter back to your tribe and she will be the mother of many warriors.'

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"Throwing a buffalo robe over his arm the old chief took his daughter by the hand. He sent boys out on the prairie and the latter returned driving before them a number of strange looking animals, with flowing manes and tails. These the old chief took to the brink of the mountain. There he commanded the young man and the girl to stand upon the buffalo robe. Upon the robe he placed many of the strange animals and lifting his hands he made signs toward the east and the west -- whereupon the buffalo robe, with all that were standing upon it, lifted slowly from the ground, moved silently over the brink of the mountain and descended slowly to the prairie below. The young man and the girl each mounted a horse -- for such the strange animals were, and driving the others before them they returned to the village. It was thus that the horse came to the Blackfeet."

I am sitting at the campfire of another venerable member of the tribe of Blackfeet. Again I shot the question: "How did the horse come to the Blackfeet?" In almost perfect English he told me this story: "Many, many years ago, long before the white man came among the Blackfeet, a hunting party of that tribe made its way to the south to the land of Meekskinectape, the men who pound on iron. Far to the south the hunters met a party of these Indians and there for the first time they saw strange looking animals. These animals were being ridden by the men who pound iron. They were nearly all buckskin colored and the Blackfeet hunters gave them the name of Poo-noo-ka-ne-ta -- looking like an elk. The Blackfeet traded for some of these animals and took them back to their village. That is how the horse came to the Blackfeet."

I am sitting in my office. On the other side of the desk is my friend General Hugh Scott, than whom no man in the world is better posted on the history, traditions, legends, and customs of the Indians of North America. I shot the question: "General, how did the Blackfeet get the horse?"

A fine example of the terseness and directness of the military man is embodied in his answer. "They stole them from the Shoshones."

There you are. Take your choice. Your choice will depend upon the mood you are in when you read this story. Now dear critics -- you who take your Indian lore seriously -- forego your criticism -- spare us your indulgent smiles -- save your sneers for those who will take them to heart. The foregoing may or may not be veracious history or accepted legend. The Indian words used therein may or may not be authentic. Again, I say I repeat them as I heard them. If it is of any interest to the reader, I will say that I personally believe, when it comes to the North American Indian, or any other subject, General Scott knows what he is talking about.

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SOCIOLOGY OF THE DEER FAMILY

Earl Dissmore, Chief Ranger

To study the life history of the deer family is one of the most fascinating occupations of the ranger during the long winter months. In our feed yards it is quite easy to become familiar with at least seventy-five or eighty individuals of this most interesting family.

The close observer will soon discern that a deer has characteristics closely akin to those of a human being. Deer can be observed that have exceptional cunning, such as an old doe that was a regular boarder at one of our feed yards at Belton headquarters. She was the first to arrive at the yard when the alfalfa was scattered and went from pile to pile eating the tender leaves off the stocks before others arrived. If it should happen that too many deer came into the yard before she had her fill, up would go her head in a listening pose, her flag would slowly rise and spread fanwise, then she would sound the danger whistle and race for the nearby timber. Immediately the herd would be in action, racing for the timber and cover. Back would come the doe, stamping and whistling. On reaching the feed yard she would make a hurried round of the hay piles, picking up the choice morsels before the rest of the herd should return.

Then there is the bold and braggart type, which is usually a young buck. His time in the feed yard is spent fighting, harassing and cowering others more peaceful. The same buck after he is deprived of his weapons (the horns which are dropped during December and January) loses a lot of his aggressiveness and likeness to a braggadocio and becomes a fit person to become a member of our deer yard family. Other deer are observed that are timid and meek, coming only to the outer edges of the feed yard and who are easily cowered or driven off by their more domineering fellowmen; others that are eccentric, choosing to be alone rather than enjoy the company of other deer, and so on thru the various traits with possibly the exception of penuriousness, of which no deer can be charged.

Another oddity of the deer family and other animals, as well as of man and plants, is that they are subject to albinism. In Glacier Park we have a perfect specimen of an albino deer. Members of the ranger force have reported seeing a two-year old doe whose hair is pure white, and nose and eyes of a pink shade. Ranging in the same vicinity as the doe, there is a buck that may also be called an albino. His coat of hair is of a light grey shade, mottled with white blotches. Otherwise all his features are normal.

Whitetail deer number the largest of any animal in the Park, and for this reason they are the most easily encountered and observed. Visitors to the Park derive a lot of pleasure watching these fleet, trim and graceful creatures bounding thru the timber or peacefully grazing near the highways as the tourists drive by. We of the Park Service thoroughly enjoy their companionship, especially during the winter months when other animal life has migrated south or hibernated for the winter.

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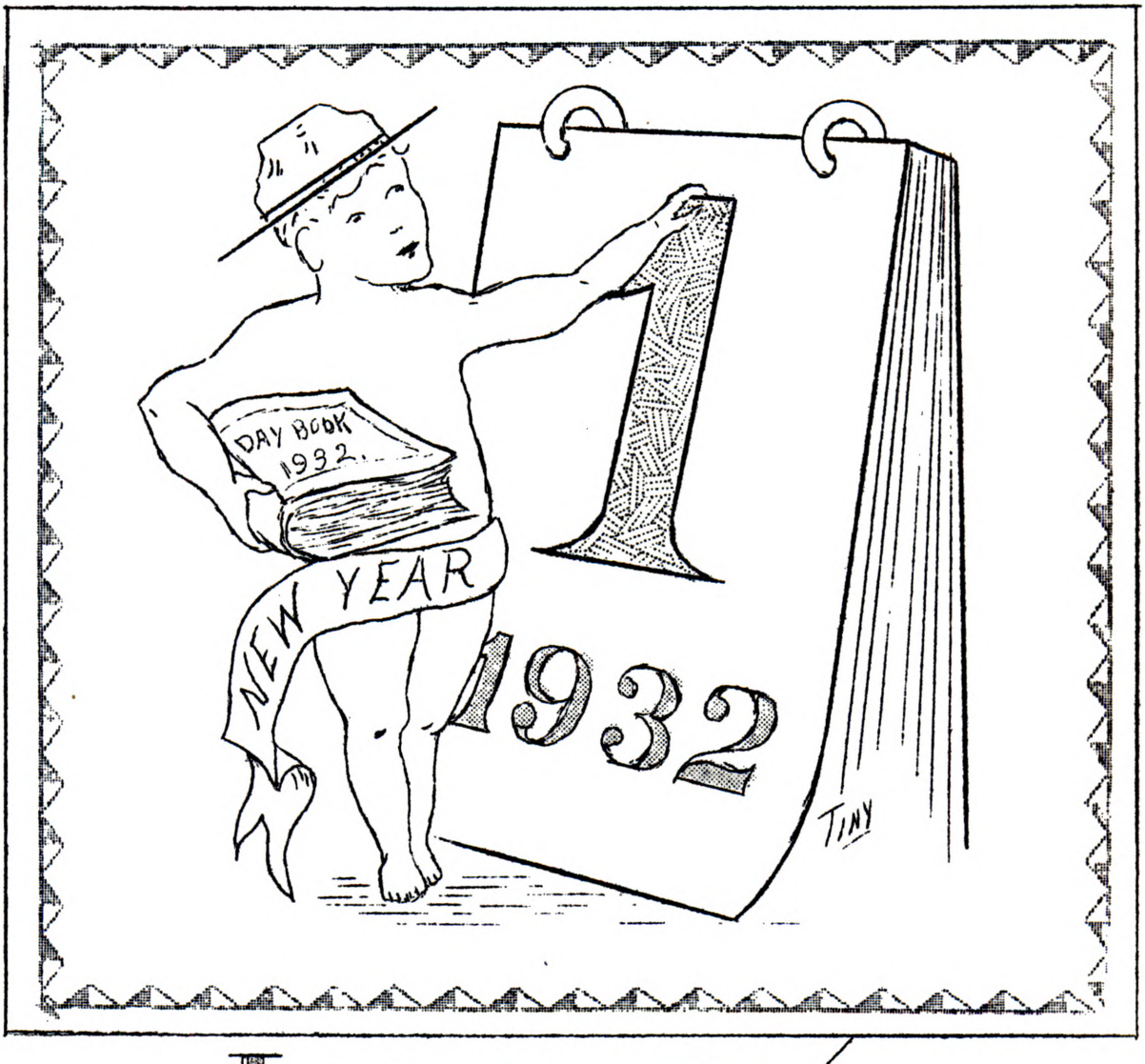
GLACIAL DRIFT

NOTES FROM GLACIER NATIONAL PARK



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UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
GLACIER NATIONAL PARK

GLACIAL DRIFT

Volume V January-February, 1932 Number 1

A popular pamphlet edited by the Park Naturalist and distributed gratis from time to time by the Educational Department of Glacier National Park to persons and organizations interested in the Park and its natural history.

Eivind T. Scoyen, Park Superintendent Dr. G. C. Ruhle, Editor

Perception of Nature leads to knowledge;
Knowledge, to Understanding, Interest, Love.

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"National Parks are spacious land areas essentially in their primeval condition and so outstandingly superior in quality and beauty to average examples of their several types as to demand their preservation intact and in their entirety for the enjoyment, education and inspiration of all the people for all the time." - Camp Fire Club of America

"...(The) policy (of the National Park Service)... is firmly established on three broad principles: First, .. the national parks must be maintained in absolutely unimpaired form for the use of future generations, as well as those of our own time; second, .. they are set aside for the use, observation, health, and pleasure of the people; third, .. the national interest must dictate all decisions affecting public or private enterprise in the parks." - S. T. Mather, Fifth Annual Report of the National Park Service

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AMOS 'N' ANNIE

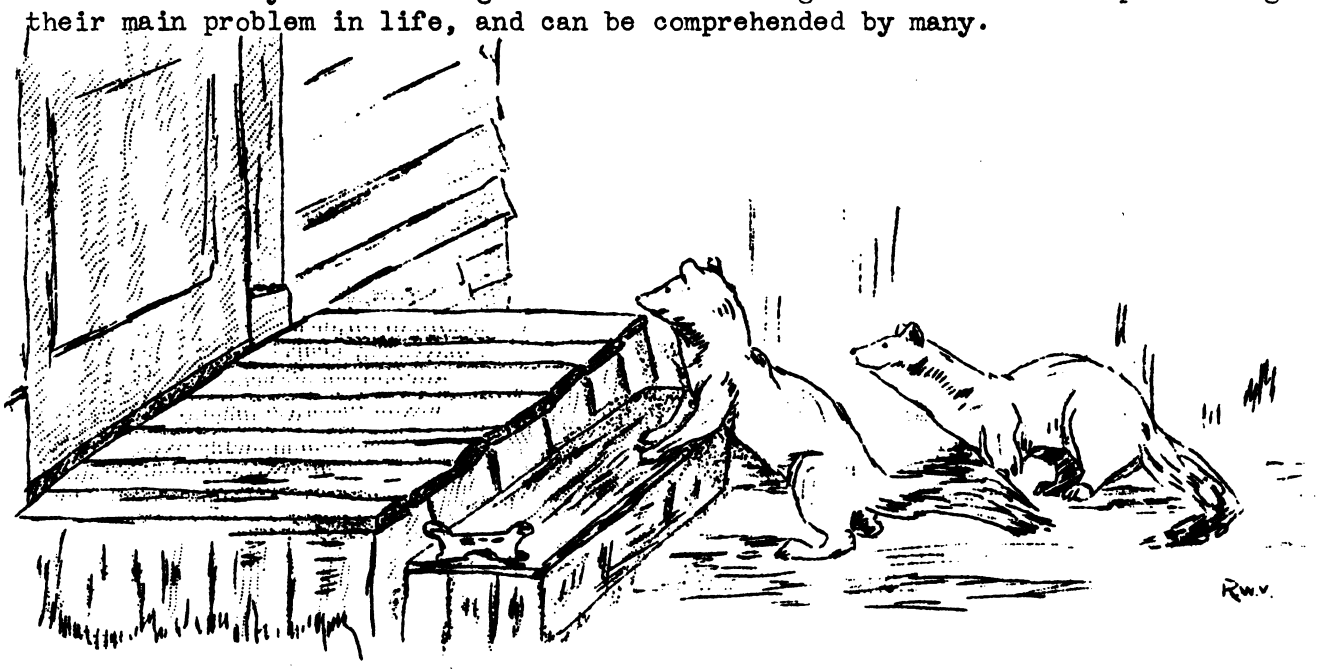
L. O. Hanson, Park Ranger

Marten, though quite numerous in Glacier Park, especially in Waterton Valley, are wary and elusive so that they are seldom seen, even by rangers. Early in February, I noticed each morning the fresh tracks of one of these animals in the snow about my station. By distributing around a few pieces of meat, I soon had him appearing in daytime. Within a week, he could be lured into the ranger station to take food from my hand. His approach was cautious, a hitch at a time, with queer little grunts accompanying. When within reaching distance, he would make a quick grab for the proffered bit and scuttle through the door.

After a short time, he brought along a partner, and so I promptly named them Amos 'n' Andy. Later, I decided Amos 'n' Annie were more appropriate. Wariness soon wore off, the two roaming frequently and freely through the station investigating everything. Now they will jump on my lap to accept bits of meat or to couch there to be petted, purring like cats.

Like others, these two seem to have their domestic difficulties too. Their family rows sound much like the arguments of house cats on the back-yard fence at two in the morning. When a stranger arrives, neither marten makes its appearance at the station, but in a day or two both return gingerly to renew friendship and--more important--to accept my hospitality.

There seems to be no surer way of winning the confidence of creatures of the wild than by the offering of food. It is a gesture of friendship touching their main problem in life, and can be comprehended by many.



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LET'S GO HORSEBACK
(Part I)

-- Dr. Morton J. Elrod

Of the thousands who yearly ride horses in various portions of the Park, but few give any attention to the difficulties in getting and keeping the large number of animals, to the great amount of loose material that is necessary, or to the details of keeping the corrals and horses ready at a moment's notice for many riders. It is no small job. There are about eight hundred horses used during the season, and the number is fast increasing from year to year. Each saddle horse requires saddle, bridle, saddle blanket, and a slicker for the rider. Every horse used on the trails is shod on all feet. There is a tremendous number of straps and buckles to get out of order, stirrups to be adjusted, throat latches to break, saddle girths to get lost, and saddle blankets to be scattered all over the country. There is a great deal of meterial, and it takes constant vigilance to keep it serviceable. Moreover, the horses are being taken from place to place daily; often horses and accoutrements accumulate where they are neither wanted nor needed. Then a herd of animals, saddled and bridled and ready for service, must be deadheaded to another place, where they are in demand. The reader may understand one's feelings when, footsore and weary from a walk of fifteen or twenty miles, a bunch of twenty to thirty horses pass, all good riding animals, going in his direction; yet he must step out of the trail to see them pass by riderless. However, it is but fair to say that no one was ever left along a trail who expressed a desire to ride.

Headquarters for horses are at Lake McDonald Hotel, at Glacier Park, at Many Glacier, and at Going-to-the-Sun. At each of these places a man is stationed to look after the business, and, from each, guides may be secured for trips to any portion of the Park where trails lead. There are regular routes with regular prices, but one may go off the beaten path if one so desires, may go special, the only proviso being that the guide must be familiar with the country.

The largest number of horses is kept at Many Glacier. One may take a different regular trip from the hotel each day for a week; one may travel the North or South Circle trip for five days longer if so desired. The corral at Many Glacier is near the road, plainly visible to all who pass, whether on foot, on horseback, on the busses, or by private automobile. It is a real treat to see the camp when the horses are coming in or going out. It may be possible to see several hundred horses being prepared for the day's work, with dozens of guides and helpers getting them ready. In the evening, when the tired beasts have been unsaddled and turned out into the pasture, their first act is to take a good roll. Dozens are sometimes kicking up the dust at once. As I was raised on the farm, I was taught that unless a horse rolled over he was not worth much. I almost invariably stop to count the number that so perform.

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Fifteen miles a day is considered a day's work for a horse in the Park. Some think this is very low mileage. If the horse were to work only a day or two a week and rest the remainder of the time he could make much more. Indeed, they are frequently taken twenty-five or thirty miles, but they are not expected to do much the next day. And when one considers a trip of fifteen miles each day, each day in the week, all summer, half of the way up hill and the other half down hill, it will readily be seen that a month or so is all that is needed to slow down the best horse. Rarely is it possible to go faster than a walk. Loose stones frequently get into the trails, over which the horses stumble. It is just as difficult and painful for a horse to step on a rolling stone as for a man, and all know what that is like. Then, too, horses have different riders each day. Many of these riders know nothing about a horse and freely admit it. Others think they know all about riding and in reality know very little. Not a few are experienced, but do not discrim inate between riding on a trail and over a good pasture or along a good dirt highway. Park horses have been taught guidance by neck rein, and do not understand what is wanted when pulled by the bit on one side or the other. The horses, therefore, do not have an easy trip of it, and all things combine to general disturbance of daily action. Horses ridden daily by the same person know what is wanted, and respond instantly. Every guide rides the same horse from day to day, and is very particular that his mount is not given out promiscuously. It is, indeed, a great concession when one is offered the special horse of some guide or other person of the Park Saddle Horse Company.

The horses are all well broken, are gentle, are broken to riding with neck rein, are accustomed to standing when the reins are trailing, are accustomed to the trails, and to foraging for food after the day's work. With the exception of the horses that are ridden constantly, and the few that have to be kept for emergency, the horses are turned out to graze at night. This does not apply to all camps, nor at all times. Often the grazing becomes scarce, or the horses have too hard a day, or the season becomes dry. Feeding hay is then a necessity. The amount of hay used during the season is a large item. To Sperry and to Granite Park, hay must be conveyed on the backs of pack horses. Two bales make a load, a very bulky and unwieldly one at that.

Mules have been substituted for packing from Many Glacier to Granite Park. They make the trip daily. They carry everything on their backs from provisions for the table to beds, hay, lumber, bed springs, and cook stoves. They are packed every morning at the storeroom, and are usually watched by an admiring and interested audience.

These mules have traveled the Swiftcurrent Pass so many times they seem to consider the trail belongs to them, and take the inside when passing, so I am told. The guides do not wish to meet the mules any place on the switchbacks and I am sure if I should meet them I should turn about and retreat ahead of them until there was ample room for passing.

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WHY GLACIAL DRIFT?

Drift constitutes one of the most lasting features of glacial action, is one of the enduring evidences of glaciation long past. As a glacier moves down its course, picking up whatever it can use in its work, and purveying it as far as possible, so the Educational Department of Glacier National Park gleans bits here and there to help in its work, and broadcasts them as far as possible. These bits are our tools. Collectively, they constitute our GLACIAL DRIFT.

This pamphlet is edited by the Park Naturalist and issued from time to time as park facilities permit. Its contents are original articles, notes, digests, poems, sketches bits of park life, comments and opinions of interested parties. Members of the park staff and voluntary contributors comprise its aggregation of writers. Editorials are included whenever possible, feasible, urgent. These, true to their name, are solely expressions of conviction or opinion of the Park Naturalist as editor, not necessarily the general consensus of feeling of the National Park Service or of Glacier Park. Many items are included despite lack of literary merit, for GLACIAL DRIFT endeavors to preserve and transmit a cross section of the individuality and atmosphere of the park's dramatis personae.

GLACIAL DRIFT stands primarily for conservation, for the protection and perpetuation of our natural features, for the application and operation of the fundamental policies of the National Park Service and of the Educational Division. It seeks to further its aims by the development of a love of nature through observation and intelligent understanding.

A regular mailing list for GLACIAL DRIFT is maintained by the park. About five hundred copies are prepared of each issue. As long as the supply lasts, these are mailed free anywhere in the United States to every one requesting them. On rare occasions, copyrighted articles may appear in GLACIAL DRIFT by special permission. These are fittingly marked. All other articles in the pamphlet are intended for the free use by any publication. It is merely requested that credit be given to the author and to GLACIAL DRIFT, GLACIER NATIONAL PARK. The Educational Division always greatly appreciates receiving notice or copies of articles thus used by various organizations.

GLACIAL DRIFT is prepared for your instruction and pleasure. The editor is pleased to receive for consideration contributions of general interest to the readers. Suggestions and inquiries are encouraged, and your constructive criticism is invited at all times.

A piedmont glacier is formed by the coalescence of the deploying termini of valley glaciers. Formed of mighty glaciers from the range which includes Mts. Logan (19,850 feet) and St. Elias (18,000 feet), Alaska's great Malaspina, a piedmont glacier, has an area equal to that of Glacier National Park. Its dirt-mantled fringes are capable of supporting a dense spruce forest under which lies ice over a thousand feet thick.

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TILL

Elk in February - Elk on the east side of the Divide have wintered better than those on the west. During the deep snows of the month, a few migrated to more open slopes east of the Park, but after a chinook in the latter part of the month they returned again. It is rather queer that elk did not come into the Two Medicine feedyard for hay during this month of heavy snow, but at the Red Eagle feedyard above St. Mary Lake they broke the fence around the hay stack and ate up twelve tons of hay in ten days. On the Middle Fork of the Flathead River, elk are not faring so well. A small herd of fifteen that was wintering on Running Rabbit Mountain had to abandon the higher levels and move down to the river bottom for browse. One lone bull elk is wintering near the forks of Mineral and McDonald Creeks in the McDonald Valley and six are wintering four miles above Going-to-the-Sun Chalets.

- E. T. Scoyen, Superintendent

Local Adaptation - I was greatly surprised while on a trip up Nyack Valley late in February to find elk living in the deep snow and in dense spruce forests under about the same conditions as moose are generally found during winter months. In my many years in Yellowstone, I do not recollect ever having seen elk trying to winter under conditions as severe as in this case. However, information at hand indicates there is nothing unusual about this in Glacier. It is probably a good example of local adaptation to environment as there are no high, grassy, wind-swept ridges on this side of the Park where these animals can go for the winter. - E. T. Scoyen, Superintendent

Thawed Pride - Snow has piled deep this winter; foraging has been difficult for many forest dwellers. On January 24, two mule deer skulked wistfully on the skirts of Lake McDonald feedyard. For years their kind had disdainfully scorned dole, while white-tailed kin were kept sleek and satisfied with a liberal supply. Even at feeding time, they had stalked unafraid thru the yard, but always with head held high above temptation. Why? These two deer essayed an answer. Gingerly they advanced to eat a few wisps of alfalfa. "It is the first time that I have witnessed mule deer eating at the feedyard," reported Ranger Buchanan of that district. (See GLACIAL DRIFT, IV, 9 -1931)

Affectionate - A tame buck took over quarters and bedded down on the front porch of the home of the caretaker for Lake McDonald Hotel. Then developed a strange, new friendship with the caretaker's cat* Affection is shown by their licking of each other's faces. - H. W. Buchanan, Park Ranger

Flood Victims - Beavers have not been very active until the last of the month, when flood waters brought them out to reinforce their houses or to secure additional food. Three of these animals living near the bridge below headquarters were flooded out by the high water. They spent two days and nights on a partially submerged log near their flooded home. After waiting two days in vain for the flood waters to subside, they gave up hope and drifted down the river to find a new home. - E. F. Dissmore, Chief Ranger

* A menace to wild life, cats and dogs are barred from all public lands within the Park, but cannot be prohibited from private holdings.

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Beaver Dole - Add the beaver to Glacier's growing list of dole recipients. Late last fall, a family moved alongside an old working in a pond of still water four feet deep. Before freeze-up, I noticed the scant food supply and made a mental note of help needed if cold weather were prolonged. On the sixth of January, I started feeding them aspens which were much appreciated, judged from their rate of disappearance. - H. O. Krause, Park Ranger

Here's One for Ripley - The staff of life for porcupines in this region is the bark of lodgepole pines. But cardboard boxes, asphalt roofing paper, tar paper, axe handles, soapy washboards, and perspiration-permeated wood and leather have also been relished as food. Despite the formidable nature of this list, I was astonished to discover that a fifty-pound bale of oakum had been eaten by these rodents. Impregnated with creosotic tar, indigestible to the extreme, repugnant in appearance and odor, oakum seems not to have affected its consumers seriously, for they still plod around in apparent best of health. - L. O. Hanson, Park Ranger

Alleviative - Wood rats and mice are inveterate pests of ranger and backwoodsman. Because it alleviates with its rodent-catching ability, many a member of the weasel family has been welcomed into the park ranger's family. circle just like the house cat is welcomed in the city or on the farm. Trusted but not trusting, Ranger Faulev of Two Medicine District tells of such semi-domesticated weasel in his December report: "The weasel which lives in the woodshed has become very tame and will leave its hiding place to accept a small piece of fresh meat off the toe of my boot. He would eat it out of my bare hand, but I fear his sharp teeth. Very few mice have been seen around the station since he arrived a month ago, although they were very numerous prior to that time."

To the Victor Goes the Prize - Ranger A. Fluetsch of Kishenehn District reported seeing the following incident on January 26: "A golden eagle zoomed from the heavens upon a coyote tugging a ten pound neck of deer across the ice of Kintla Lake. Up it soared, down it crashed again and again, each time bowling over and mauling the dog. Such terrific beating was too much; the coyote slunk for safety of the brush-covered bank. The winged assailant followed close after, pounding continuously and unmercifully with powerful pinions, and rasping with distended talons. Certain of the rout, the eagle turned back, flew off with the lickerish prize."

Snow-gauging - In January, forty snow measurement stations were established at various elevations thruout Glacier Park. Measurements are made regularly by rangers on winter patrols watching for poachers. The reports, filed monthly at headquarters, are of importance since Park mountains mother headwaters of several important river systems. The data is useful in planning forest protection projects and in gauging availability of water for nearby irrigation districts. Records of measurements are available to all interested parties.
- E. T. Scoyen, Superintendent

On the seventeenth of February, a pack of four coyotes ran mountain sheep out of the Many Glacier feedyard, killing two. Next day three more sheep met similar fate. Only choice yearlings were slaughtered.
- C. G. Harkins, Park Ranger

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Welcome to the Fold - Latest to join the ranks of Park Service units who issue popular pamphlets similar to GLACIAL DRIFT are Southwestern Monuments with a fittingly titled monthly, the Epitaph, and Colonial National Monument with its offering, Historical Notes. "Epitaphs and monuments are naturally associated in people's minds so what more natural than the name we have chosen for our venture?" opines Superintendent Pinkley as he embarks his "ship of thot on the ocean of Park Service literature." "The aim (of Historical Notes) will be to present in each number a studied discussion of some historical subject," explains Editor Elbert Cox in the junior publication. GLACIAL DRIFT congratulates as it welcomes with sincerest wishes the new literati into the fold of Park Service editors.

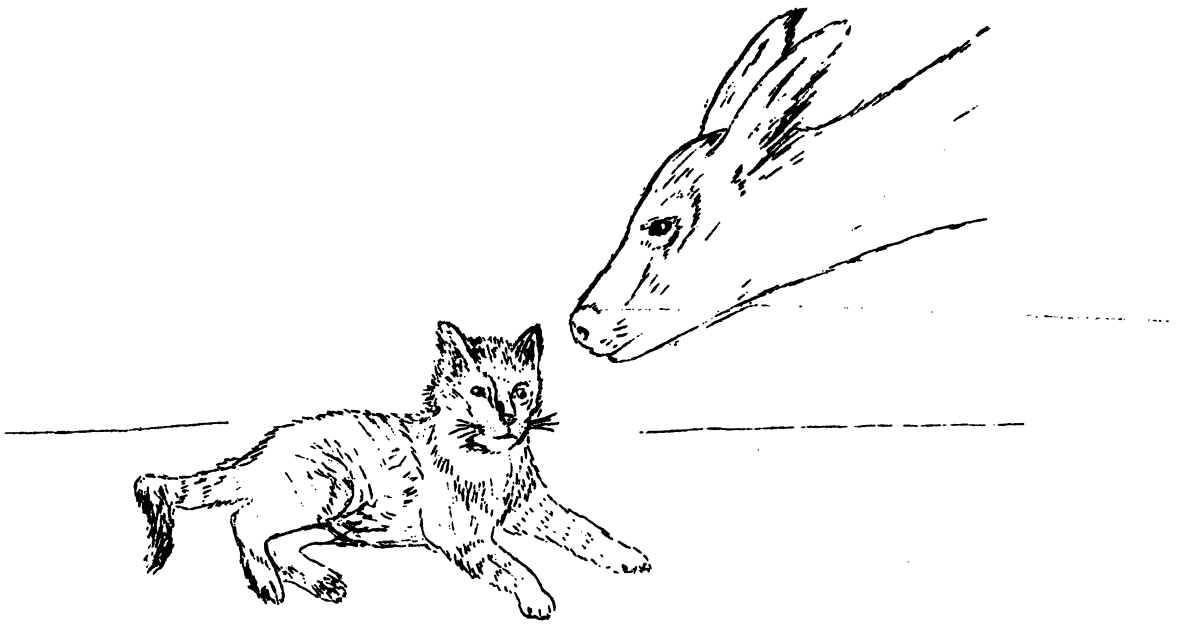
Last of summer resident birds to be reported in the Park were two robins seen by Ranger Howell near his North Fork Ranger Station on November 16.

Waterton Lake froze over on January 12 when the temperature dropped below zero for the first time this year. The thermometer touched -22 on the thirtieth of the month. A solitary mallard endured all month in the open water at the mouth of Kootenai River. - L. O. Hanson, Park Ranger

On January 29, the temperature touched 29 below at Two Medicine. Coldest recording of the winter at Belton was 18 below on February 14.

While crossing the lower end of my pasture at Lubec on November 5, I found four blooming pasque flowers. - A. R. Best, Park Ranger

William Gould Vinal, ranger naturalist at Sun Camp at the close of the last park season, has an interesting article in the March "Cosmopolitan." It is titled "March Winds and Spring Fever."



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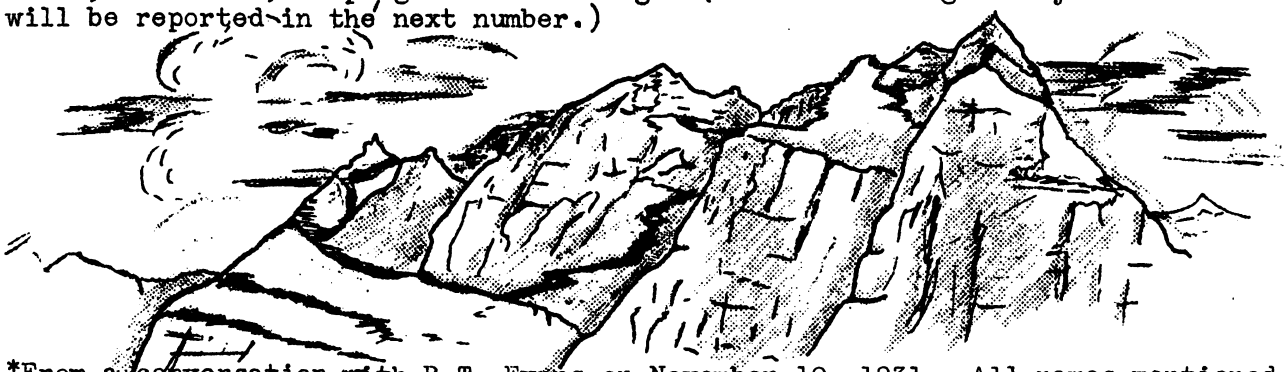
PLACE NAMES
of Glacier National Park and Vicinity

15-29.* At the time that Glacier National Park was created, members of the United States Geological Survey were carefully mapping the region. Among the topographers was R. T. Evans, who with S. T. Penick mapped the sector south of 48°30'. Mr. Evans was confronted with a host of features, only a few** of which were already named.

The year of the mapping, 1910, will always be remembered as the most terrible of fire years. Great forest fires were sweeping throughout the whole northwest. Vast areas in the southern and western portions of the Park were devastated. Vainly a company of negro cavalry helped fight the fire, and affected the naming of features. Thus, RAMPAGE Mountain was named from the fire rolling over it; SALVAGE Mountain, because it was partly saved; SOLDIER Mountain, from the cavalrymen who helped save it. JACKSTRAW Lake was named for the piles of burned trees accumulated on its shores; DEBRIS Creek, from the refuse left by the fire. The humus, or ground cover, burned to a sepulchral white and the lifeless masts of burned trees suggested the name for SKELETON Mountain. A firebrand blown through a pass set fire to forests on the east side of the Continental Divide and suggested its name FIREBRAND Pass.

Mr. Evans obtained a list of Blackfeet chiefs from the Indian reservation and augmented these with names of others of whom he had heard. So LITTLE DOG Mountain was named for that Blackfeet chieftain who sixty years previously had described to Governor Isaac A. Stevens the pass (Marias) which was curiously to elude all efforts to locate it. THREESUNS, WOLFTAIL, EAGLEHEAD, BEARHEAD, RED CROW, and RUNNING RABBIT were likewise named. And as Mr. Evans mapped, he saw the summit of a peak showing over the shoulder of an adjacent mountain: hence, APPISTOKI, Peeping-over-Something.***(Further names given by Mr. Evans will be reported in the next number.)



*From a conversation with R.T. Evans on November 10, 1931. All names mentioned in the article were given by Mr. Evans unless otherwise stated.
**Already bearing names were: Two Medicine Lake; Summit, Elk, Sheep, Squaw, Bison, and Henry Mountains; Church, Butte; Midvale, Ole, Park, Coal, and Nyack Creeks.
***Probably Appistotoki, God, the Maker, who is "Over Everything." (F.X.Guardipee)

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GLACIAL DRIFT

NOTES FROM GLACIER NATIONAL PARK

1932

MARCH
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UNITED STATES
DEPARTMENT OF THE INTERIOR
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GLACIER NATIONAL PARK

GLACIAL DRIFT

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"My thought is that National Parks .. should be those of outstanding scientific and spiritual appeal, those that are unique in their stimulation and inspiration."
- Herbert Clark Hoover

* * * *

"The educational and inspirational value of the National Parks is far greater than any material gain that might be derived thru industrial utilization of their natural resources."
- Ray Lyman Wilbur

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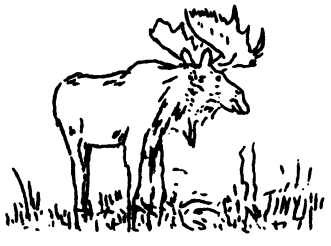
BACKWOODS SPORT

B.C. Miller, Park Ranger

There are two animals, the grizzly and the moose, with whom backwoodsmen will not argue. Both are extremely powerful. Generally they attend only to their own affairs and fade out of a picture before being seen, but on rare occasions they have charged human beings.

It was on my mid-month snow measurement trip that I sighted two moose a mile below Bowman Lake. One of them fled upon seeing me; the other, a magnificent bull, charged my way. At first I thought it was curiosity or ignorance of my presence that brought him on, so I stopped to await developments. When he reached within fifty yards, I hallooed and waved my arms. He stopped, but for just an instant, shook his head and came on, faster this time. In the twinkling of an eye, I had unfastened my snowshoes and bounded up the nearest tree, which was a young spruce, certainly not desirable for a pleasant climb. The moose stopped within four or five feet of the bole, glared at me with a malignant gleam in his eye. The hair on his neck bristled. He constantly shook his head and stuck out his tongue as if "licking his chops."

Perched safely, but uncomfortably, high above him, I discharged my pistol, shouted, whistled, waved my arms, and did all I could in an effort to intimidate him, but he stood his ground, daring me to come down. Changing tactics, I tried keeping quiet to see if he would leave. Perhaps, meanwhile, he too decided on a change of tactics, for at least forty minutes had waned without any change of attitude on either of our parts. He turned and started, as if for the creek. Thinking he was out of sight, I quietly slipped down and buckled on my snowshoes. This was scarcely done when I discovered Mr. Aggressor returning in a lope, and I had to bound back to friendly refuge of the same prickly spruce, there being no other more obliging tree nearby. The performance was repeated as before, except that I omitted all hullaballoo and kept meekly quiet. But there he stood, shaking his head and stamping his feet. Obtaining no satisfaction from this, he lowered his head and stood quiet, as tho buried in deep thought. Then he turned and nonchalantly ambled behind a bunch of willows, from which I could detect him peeping out, first on one side and then on the other. I remained sitting as quiet as a mouse on my spruce limb. He must have decided that I was intent on remaining there, so he retreated down the creek, but this time I let him have much time to continue thinking that I wasn't descending. When I did slip down to shove my feet into the snowshoe harness, I kept a wary eye in the direction in which he had left, but this time I was free to continue on my way.



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EARLY DAYS IN GLACIER NATIONAL PARK*

W. R. Logan

It was my good fortune in the springtime of my young manhood in the years 1881 and 1882 to visit the region which is now known as Glacier National Park with an exploring expedition headed by Professor Raphael Pumpelly, of Newport, Rhode Island. The first year, in the month of June, we made an attempt to enter the country from the east side of the mountains, but the snow was so deep upon the summit of Cutbank Pass that it was impossible for us to continue; so we "back-tracked" to the prairie thru Kootenai Pass. Here again we failed, owing to the tremendous amount of snow choking up the pass, and the attempt to enter was abandoned for that year, as Professor Pumpelly had other exploring work awaiting his attention in the vicinity of what is now Great Falls.

The following year we made a second attempt; this time we decided to try an entrance from the west. In the month of August we started across the Big Blackfoot, on down to the Jocko Agency, thence crossing the reservation, following along the west side of Flathead Lake to the place where the town of Kalispell now stands, which at that time was bare prairie. From that point, we moved up to the present site of Columbia Falls. At that time this fertile region, which is now so thickly populated, was inhabited by a few wandering bands of Indians, our party comprising the only whites in that section. From the site of Columbia Falls we plunged into the mountains thru Bad Rock Canyon. After traversing over portions of the Flathead country for several days, finally we came to the south shore of Lake McDonald, where we picked up an old Indian trail which led us over Cutbank Pass. The trip was a strenuous one, as we had to chop almost our entire way thru the mountains, the Indians having abandoned the trail some twenty-five or thirty years previous. Only one conversant with mountain travel can realize the difficulties to be encountered in making a trip of this nature, and more especially in following an old Indian trail, which is always laid out along lines of least resistance. Our first discovery of a glacier was at a place we called Mud Creek, the name of which in later days was changed to Nyack Creek. This glacier was afterwards named by me "Pumpelly Glacier", in honor of Professor Pumpelly, the leader of the expedition. According to information I now have, Lieutenant Ahern, of the United States Army, was the next man to enter, Ahern Pass being named after him. Then came the great Northern Railway by way of the old Two Medicine Pass, opening up to the world the famous Lake McDonald, located at the southern end of the park within three miles of their track at Belton, Montana. It was not long after that some enterprising people of Kalispell cut out a trail from Belton to Lake McDonald, and for years the people of Kalispell and the Flathead Valley visited the Lake McDonald region during the summer months. Finally the attention of the Members of Congress from Montana was called to the scenic beauties of this portion of the Rocky Mountains, and I believe Lake McDonald was visited by Senators Carter and Dixon, who were very much impressed with the scenic wonders to be found there, and steps were immediately taken to have Congress set the same aside as a playground for the American Public.

*From the "Proceedings of the National Park Conference", page 161, 1911. W.R. Logan was then first superintendent of Glacier National Park.

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LET'S GO HORSEBACK
(Part II)

Dr. Morton J. Elrod

Horses have dispositions and characters of various temperaments. They recognize their places and know what they are to do, become creatures of routine, and are set in their ways of doing things. The lead animal of a pack train, which is usually honored by being decorated with a bell, is not to be shunted from its rightful position at the head of the procession by some interloper that tries to push past. Such essays are precipitately ended by every means which is necessary or possible. Many years with pack trains have proven conclusively that horses scheme not only to get or to hold a favored place, but also to find means of delaying the procession, of shifting packs so a stop must be made for adjustment of the load, of skillfully feigning stiffness or fatigue in order to be packed lightly. A horse is likely to groan and moan and swell the body while it is being packed. Later the ropes must be tightened. On one occasion I was out with Tom Scott, a guide. I was in the lead as we ascended to the summit of a ridge. The trail continued down the opposite side thru a small clump of stunted trees. The old bell mare did not seem to understand where the trail led and was milling about in great shape, tossing her head and making the bell clang vigorously. I was dismounting when Tom came into sight. With asperity he asked what I proposed to do. When informed that I was going to take the bell mare by the head to start her properly down the trail, Tom exploded with wrath. Did I want him to get off his horse all the rest of the summer to start that old mare properly, tho she knew very well where the trail was, but did not want to go down hill? Did I want to ruin a good lead horse by doing such a silly thing? "Use a club and a few rocks, and show her who is boss." From his talk, one would think Tom was vicious with horses, but he was really very gentle, and rarely touched a horse except to throw something in its direction to announce he was watching. A bit of yelling, arm-swinging, and show of a stick was sufficient to declare that business was intended. The lead horse calmly took the proper trail and started down the mountain.

On another occasion we had an experienced pack animal that was always fitted with an aparejo. All others had pack saddles. The guide thought he could make the pack firmer on the aparejo than on a saddle, and this animal had the habit of humping stiff-legged downhill until the pack became improperly adjusted and had to be attended to. This gave a resting spell. We always watched the lash ropes of this horse closely. It was comical to see some of the attempts to shake the pack on one side so as to induce the stop.

When I accompanied the first tourist camping trip to the north end of the Park I was given a special mount by the Park Saddle Horse Company, so

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they said. Smoky had been used in the movies, I was told, to take a rider up the steps of Glacier Park Hotel. This was a sure sign he was all right. One day I saw a length of small stove pipe that had dropped from one of the packs and dismounted to pick it up, for stove pipe is a necessity, and there is none except that which is taken along As I mounted, I unconsciously lifted my arm high to tuck the stove pipe under for easy carrying. That was too much. Evidently the sober horse mistook the thing for a big club, swung for a blow. At any rate, I got a fast ride for a quarter-mile.

Later, just as we were turning to the tie-rail at the end of this ten-day trip, when it was all over and horse and man alike were glad of the return, Smoky struck an empty lunch box with his right foot and kicked it into the air about as high as his nose. Without an instant's hesitation he leaped straight up, coming down sideways and some distance away. When he saw what the thing was, he looked rather silly, for a horse, and resumed his docile appearance. And just a few hours before, as we were coming down Swiftcurrent Pass Trail, I tied the long reins together and held them in the hollow of my left arm, manipulating the camera with the right. As one of the ladies gave a scream and others yelled a note of warning, I felt a tug on my left arm. Looking around, I saw Smoky on the very edge of the precipitous trail, leaning far down to nip off some specially luscious bit of herbage. It was a long way to the bottom, but there was no danger. A two-footed animal might have slipped, but never a four-footed one. And Smoky had been over that trail many times, too. He had learned what was safe, while the tourists were sure he was going over the cliff, dragging me along with him.

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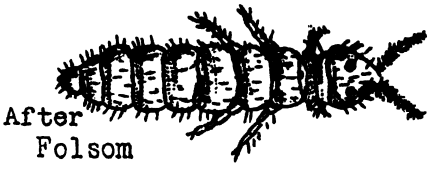
After Folsom

SNOW FLEAS

G. C. Ruhle, Park Naturalist

Creatures equipped with a ventral collophore bearing a pair of eversible sacs thru which exudes a sticky fluid that enables them to adhere to smooth surfaces: such are the insects known collectively as collembola. This name, which is from the Greek, means "glue-pegs." Collembola are wingless insects that have no indication whatever of having descended from winged ancestors. Some species, however, are specially equipped to offset this lack. These carry a caudal furcula which serves as a springing organ to catapult its possessor thru the air. When not in use, this is folded forward under the body and is kept in place by a convenient tenaculum, or abdominal catch. Thus arises their common name, "spring-tails."

Thruout Glacier National Park, there appear on the snow of late winter months great numbers of brilliant canary-yellow spring-tails, commonly known as snow fleas. Tho individuals are very tiny, about one-sixteenth of an inch long, their abundance may completely cover the surface of the snow with golden color. Others float on standing pools of water. This year they have occurred in great numbers very shortly after the severest of winter weather. They exist for a few days only and are carried off with the run-off from the melting snow.

EDITORIAL PAGE

CIVIC PRIDE

Civic Pride is that quality of temperament which impels men and women to strive for civic beauty and orderliness simply because the community is thereby made better and more livable. It is not just a blah-blah of the voice but a deep rooted conviction coupled with industry and an active determination to bend every effort towards its accomplishment. It is more than the erection of statues, more than a lavish of expenditures, more than the hollow laudation of swaggering politician and braggadocio. Its roots sink far deeper than superficialities of sentiment; its genesis is within the very soul of its possessor.

Civic Pride is the glory of the past, the pleasure of the present, the hope of the future. It is a cure for indolence, a hobby for the hobby lover, and a joy forever. It is that glorifying stimulant which automatically subordinants and kills the narrow deceptive advantages of the individual for the sweeping benefit of many. In spirit, it is a splendid democracy of communal good in contrast to crabbed tyranny of selfishness.

Civic Pride makes impossible such atrocious desecrations as automobile cemeteries, town rubbish dumps, corrugated iron shacks. It demolishes buildings, houses, and barns that have crumbled into unsightliness with time and

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disuse. It keeps the lawn mowed in summer, the walks snow-shoveled in winter; it plants trees, shrubs and flowers; it increases the value of property. It removes sharp stones from our pathway, irritant beams from our eyes. It permits wild flowers to grow in places where the hand of God Almighty planted them. It renders unnecessary such statutes as billboard and zoning regulations. It is the palladium of our forests against fires engendered by carelessness and ignorance; it is the insurance for preservation and protection of scenic and recreational resources of our country. It is the oil which keeps transcendant the beacon light of civic beauty and accomplishment. Civic Pride makes the world a better place in which to live.

Civic Pride is that restraining quality which kills advertising on public highways because that detracts from the urban beauty of landscape and aggravates an omnipresent, unsightly cluster of existent billboards. It quashes the inherent greed and graft of power-grabber. It represses the stringing of telephone poles across beautiful vistas, the pocking of landscapes with oil stations and hot dog stands, the rape of vale and woodland with paper, tin cans, and other rubbish left by "Nature enthusiasts" and picnickers. Civic Pride is the death knell of over-exploitation for commercial reasons of areas of civic enterprise, such as the national parks.

Civic Pride is that spirit in you, Mr. Reader, which keeps you from carelessly tossing aside so much as a burned match. It is a manifestation of your greatness, unselfishness, beneficence, utility, solicitude for and love of home and country. It is your badge of patriotism and statesmanship.

Switzerland has a law forbidding the throwing of solid materials from train windows or in all public places. That law is the outgrowth of Civic Pride in Swiss legislators.

I have seen a ranger in a national park stoop to pick up empty kodak cartons, cigarette packets, tinfoil, gum wrappers, and orange peels to bury them out of sight under a rock or stow them in his pocket for subsequent disposal. A real exposition of the active presence of Civic Pride!

Do you, Mr. Average American, respect America? Do you really love it? Is your respect and love to be gauged by the rubbish you cast in the streets, the screaming discords of color with which you streak your properties, the spirit of "I don't give a damn for the other fellow so long as my own interests are best served"? It may appear great for you to go about shouting "Let's make America great! Let's make America beautiful!" but what are you actually doing about it?

A community is the summation of a myriad of factors, great and small. That community has Civic Pride in which every individual strives with splendid unselfishness of purpose and magnanimity of sacrifice towards the common goal of municipal betterment.

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CURRENT SPRING

A most pleasant privilege of growing spring is to watch for the reappearance of old friends who have been absent during the winter months. For scientific record, GLACIAL DRIFT has been diligent reporting arrivals of birds each year, going even to adjacent territory, tho outside the Park, for information and records.

Observations of arrival and appearance are later this year than in the preceding biennium. Again, first of the birds to return was the varied thrush that appeared at headquarters on March 15. Last year, one of these birds was seen as early as February 8 (GLACIAL DRIFT, IV, 32). A killdeer was reported near Belly River Ranger Station by Ranger Krause on March 17; robins and bluebirds, near St. Mary Lake by Assistant Chief Ranger Tom Whitcraft on March 31. Canada goose flew northward over Lake McDonald on March 21; hundreds of snow geese, a truly remarkable sight, paddled in the small open stretches of that frozen body of water on March 30 and 31. While snowshoeing thru hushed forests near headquarters on March 15, the Park Naturalist discovered the first flicker who hammered out his call in haughty voice. The rollicking ruby-crowned kinglet, seldom seen tho constantly heard in spring months, was back on April 15. It forages exclusively in lofty crown foliage. Pipits teetered their tails as they minutely examined plowed fields and meadows below Belton on April 24. Next day, Assistant Chief Ranger Croghan saw pink-necked avocets stalking in shallow waters near Sprague Creek Camp Grounds and hundreds of horned grebes, coots, and American mergansers paddling the waters of Lake McDonald. On April 27, two swans floated serenely near Rocky Point above Fish Creek Ranger Station; that morning the Park Naturalist had heard his first Audubon warbler at headquarters, that afternoon, his first Cassin purple finch near Lake McDonald Hotel.

Perhaps an abundance of hawks and owls are responsible for the fact that Glacier Park is almost entirely destitute of reptiles. Only garter snakes may be seen at lowest elevations. Abundance elsewhere prevents their rare observations from being news for GLACIAL DRIFT. It is news, nevertheless, that Ranger Channing T. Howell saw two of them as early as March 22 this year. It was near his North Fork Station.

On the same day, Ranger Ness reported Richardson ground squirrels on the plains at the lower end of Cutbank Valley. On March 25, Ranger H. W. Buchanan fed rolled oats to the first chipmunks he had seen this season and which appeared in his woodshed at the head of Lake McDonald. Tho Ranger Hanson saw his first bear on March 8, subsequent reports on bears did not occur until the end of the month. Not until April 23 were signs of one reported at headquarters.

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THE CONCEPTION OF THE EDUCATIONAL SERVICE

Long before the creation of the bureau which is known as the National Park Service, there had been talk of educational activities in our national parks. Associated with this idea were chiefly such items as pursuit of scientific studies within the parks, preparation of popular bulletins describing scientific features, advertisement of the recreational advantages, and distribution of materials such as slides and photographs for use in visual education.

The first park naturalist was appointed on April 1, 1920, in Yellowstone National Park. His duties as then prescribed consisted primarily of observing and reporting conditions affecting natural phenomena. During the summer, he delivered popular lectures to park guests and published monthly sheets with items of interest about the natural history of the park. Nature guiding in national parks had its start in Yosemite in the same year, Dr. H. C. Bryant, now Assistant Director in charge of education, being brought to the Valley by Stephen T. Mather for that purpose. Not until two years later did educational activities sponsored by the Government start in Glacier National Park. And thus the Educational Service proper was born in Yellowstone and Yosemite.

But the inception of the idea took place in Glacier, according to Robert Sterling Yard, President of the National Parks Association, who was associated with Stephen T. Mather from the beginning of his charge of the national parks. Messrs. Mather and Yard had attended the National Park Conference at Berkeley, California, March 11 to 13, 1915. Together they visited several national parks, beginning with Yosemite. In the middle of the season they visited Glacier.

For some time, several noted geology professors from leading educational institutions had been conducting geology classes to Glacier National Park. Among these was Professor Lehnertz of the University of Wisconsin, in Glacier for the third consecutive year. Messrs. Mather and Yard heard Professor Lehnertz lecture in the lobby of Lewis' Glacier (now Lake McDonald) Hotel. They were very impressed by the effectiveness of presentation, and cogitated much over it. Mr. Lehnertz told of the extremely useful and advantageous method of getting first hand knowledge of a science in a spot where its presentation is most attractive and impressive. The individual is brought face to face with reality; his impressions are molded by observation. Mr. Mather never forgot the fact. In 1918 and '19 he observed the methods of Dr. Bryant who had been sent to Lake Tahoe by the California Fish and Game Commission for educational reasons. With the cooperation of the Commission, he started the movement which has developed into the Educational Department of the National Park Service of today.

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FOR ACKNOWLEDGEMENT AND REPORT

THE APPEARANCE OF THE CURRENT ISSUE OF GLACIAL DRIFT HAS BEEN MADE POSSIBLE THRU A GENEROUS GIFT OF THE GREAT FALLS, MONTANA, CHAMBER OF COMMERCE, who contributed twenty-five dollars for paper, mailing envelopes, and stencils. The editor expresses the thanks of the staff, of Glacier National Park, and of appreciative recipients.

Several subscribers have sent in contributions which speak loudly in these days of Depression. These have to be used to purchase materials for production of GLACIAL DRIFT. These gifts are hereby gratefully acknowledged again.

The great number of letters in splendid response to the editor's circular letter dated March 11 prevents what he would like to do: namely, to acknowledge receipt and to thank answering subscribers individually. This little note, tho inadequate, must serve.

One subscriber writes "I wish Uncle Sam might shave down Boulder Dam a little and turn the amount over to GLACIAL DRIFT."

Another subscriber would just as soon "miss the Literary Digest during its Prohibition Poll as a single number of your little pamphlet"; still another "would rather miss a copy of Time, and that's sayin' sumthin'!"

"I wish with all my heart that I had lots of money and you had lots of money so we could keep GLACIAL DRIFT encircling the globe."

Does "Ye Ed" feel good? Colloquially, "And how!"

It was suggested by a number of subscribers that a nominal fee be charged for GLACIAL DRIFT to offset the cost of materials. The editor has persistently shied from this since difficulties arise from the handling of funds and loss of franking privileges. Members of the Park force are barred by legislation from handling such monies. The principle obstacle, however, is that he wants every one to feel that these notes are being distributed for no monetary reasons whatever. Their motive is a love of Glacier National Park; their impelling force, a desire to share with others something of the inspiration and beauty which is one's portion as an employee of the National Park Service.

<u>The Cover Design</u> - One of the commonest permanent-resident birds is the red-breasted nuthatch, "Little Quank", whose bigger, rarer brother, the white-breasted "Big Quank" of shiny black crown and slaty blue upperparts, has been sketched for the cover by Eugene Kingman of Yale University Art School. As in previous years, "Tiny" (Fire Chief George N. Paige) did the lettering.

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TILL

Fallible Judgment - Do bears possess uncanny intuition which guides them in choosing safe hibernation dens? Although their choice is excellent, it certainly is not always infallible. On March 2, almost a month before the end of hibernation, I saw the tracks of a bear on the west side of Waterton Lake . He had evidently been drowned out of his sleeping quarters by the heavy rains of the previous days. - L. O. Hanson, Park Ranger

Capers - A pet buck at Lake McDonald Hotel continues to do all kinds of unusual things. During the height of winter, he would jump upon the roof of the dining room to strut and caper while the caretaker shoveled off snow or snapped pictures of him. One day he wheedled a cooked bone away from Geduhn's dog, chawed off the remaining meat, licked it clean.
- H. W. Buchanan, Park Ranger

Elusive Fishers - Because fishers are becoming rare--their fur is very valuable--and because old timers have said that they were to be found around St. Mary at one time, Ranger Elmer Fladmark has kept careful watch for their presence all winter. So far he has failed to see a sign.

Companions - My pet weasel (see GLACIAL DRIFT V, 7) is still with me and, strange to relate, a pine squirrel lives in the woodshed in companionship with him. Old trappers told me that they never used squirrel for bait when trapping weasel. They apparently do not fancy squirrel meat, altho I have seen them kill chipmunks in summer, once right on my station porch.
- C. C. Fauley, Park Ranger

On the Wings of Storm - Terrific winds and falling snow caused immense flocks of waxwings to huddle in sheltered brush thickets around Two Medicine in early March. On the wings of the storm came one hundred pine grosbeaks of crimson beauty, visited the ranger station. - C. C. Fauley, Park Ranger

The Destruction of the Pole Bridge - The old bridge that spanned the north fork of the Flathead River in front of Bowman Ranger Station was destroyed in the evening of February 28 by a large ice jam. My wife and I were the only eye-witnesses to the destruction. Jumbled cakes of ice filled the river from bank to bank as far as the eye could see. First, the middle pier was swept away; the pier on the Park side followed; then the whole bridge sagged in the middle, listed, was caught on the crest of the onrushing flood of ice and water. With a crashing and splintering of timbers, the whole structure was swept away, having lasted only ten minutes after the first impact. All that remains of the old landmark are the approaches on either side of the river. - B. C. Miller, Park Ranger

On March 22, Ranger Harkins saw twelve bald eagles on Sherburne Ridge.

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PLACE NAMES
of Glacier National Park and Vicinity

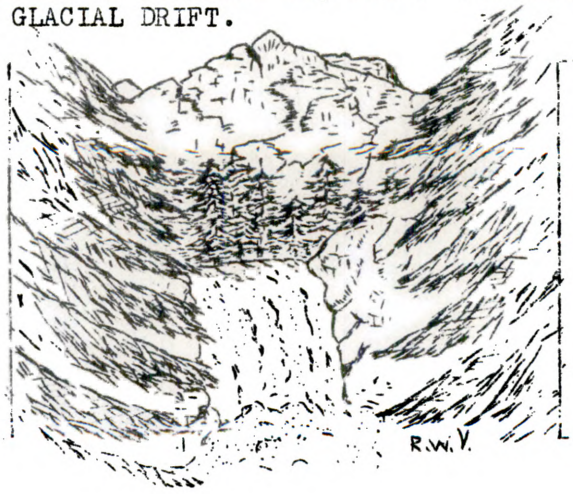
30-46* Many place names given by Mr. Evans were descriptive and self-explanatory: THREETOPS Mountain, BATTLEMENT Mountain, DOUBLE Mountain, ROTUNDA Cirque, COBALT Lake, PARADISE Creek and Park. BUTTERCUP Park, ASTER Park, and ASTER Creek were named from an exuberance of these flowers. RIVER-VIEW Mountain affords a splendid view of the Middle Fork of the Flathead. SNOWSLIP Mountain was the site of a great avalanche. AUTUMN Creek is aflame with colorful aspens late in the year. SCALPLOCK had a small tuft of trees on its summit which were spared from the fire. STATUARY Mountain is beset with many pinnacles. LOST Basin was so called since it is beautifully tucked away. BARRIER Buttes hide it from the view of the adjacent country. Mr. Evans experienced great difficulty in climbing PERIL Peak. On account of the dense smoke from forest fires, in despair he had to climb Mount DESPAIR four or five times before completing a single day's work.

As long as his camp was situated near VIGIL Peak, a lone white mountain goat kept vigil nearby. Thirty odd goats were counted by Mr. Evans as they capered on CAPER Peak. GRIZZLY Mountain was the rendezvous of a silvertip. BLACKTAIL Hills were referred to as such by railroad men.

Mr. Evans called LENA Lake after his wife. DAWSON Pass was named after Thomas Dawson, or Little Chief, an Indian Guide. He was son of Scotch Andrew Dawson, last factor of the American Fur Company at Fort Benton, and a Gros-Ventre squaw. Lake ISABEL was named for Mrs. Dawson. Mount ROCKWELL was named for an old timer. So, too, was SHIELDS Mountain. Mr. Shields was a polished idler from Virginia whose wife ran a store at Essex. Ole Creek had already been named after an old trapper.

TWO MEDICINE Pass, referred to in history and tradition of the region, was placed by Mr. Evans. From time immemorial an old trail from the Middle Fork up Park Creek passed over it.

*This article concludes the list of names given by Mr. Evans and related by him to the Park Naturalist on November 10, 1931. For other names, refer to the previous issue of GLACIAL DRIFT.



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GLACIAL DRIFT

NOTES FROM GLACIER NATIONAL PARK

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MAY

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UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
GLACIER NATIONAL PARK

GLACIAL DRIFT

Volume V May, 1932 Number 3

A popular pamphlet edited by the Park Naturalist and distributed gratis from time to time by the Educational Department of Glacier National Park to persons and organizations interested in the Park and its natural history.

Eivind T. Scoyen, Park Superintendent Dr. G. C. Ruhle, Editor

Perception of Nature leads to Knowledge;
Knowledge, to Understanding, Interest, Love.

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GLACIER NATIONAL PARK AND THE BLACKFEET INDIANS

Our neighbors to the east, the Piegan or Pikuni division of the tripartite Blackfeet Confederacy, once owned that portion of the Glacier National Park which lies east of the Continental Divide. Under pressure of prospector and miner who dreamed of a possibility of wealth hidden in its mountain fastness, unused by these Indians except on rarest occasions, this land of beauty was purchased from them in 1896 by Congress. Never since the Park was born in 1910 has there been such a feeling of goodwill towards it by the Indian as today; never before has he comprehended as fully the meaning of this preserve created for his benefit and enjoyment. In early March, as a gesture of friendship and desire for better understanding, the Park Superintendent and Park Naturalist addressed the Council of Fullbloods thru the medium of an interpreter. Both were subsequently duly adopted into the Blackfeet Nation, the former receiving the name O-mahk-es-tka, Big Mountain; the latter, Ninnah Stahkoo, or Mountain Chief

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March 27th 1932

Life is an ——→ Therefore you must know, What to at.

how to use the Then it to the

and let it .

To Doctor

From Richard Sanderville or Chief bull

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AHPISKUN

Mahkski, Park Ranger

Before man learned the use of modern weapons, or any weapon or tool for that matter, to get his food or defend himself or his from enemies, he of necessity must have had some means of obtaining food without the use of weapons; hence the Indian, the Pikuni, in his wild environment found it expedient to make use of the "Ahpiskun" with which to get his meat and incidentally the skins from which to make his clothes as well as the material for his lodge.

The Peigan or Blackfeet word "Ahpiskun", translated, literally means to roll or push off anyone or anything; hence in this case the word means a place where game such as buffalo or antelope were run over, a cliff for buffalo or a steep cut bank for antelope, and where the people were then able to get their meat without the use of weapons other than a knife or axe.

In locating the place of the "ahpiskun" or "fall", as it is called by modern man, several things were taken into consideration. First of all were the abundance of game, the ease of access to hunting ground, and the grazing habits of the game to be hunted. Then, proximity of the location to the regular lane of travel of the Pikuni in his seasonal and nomadic wanderings to and from winter and summer camp grounds. Another factor was the possibility of sojourning in that vicinity for weeks or even months considering the abundance of water, fuel, and other camp items.

The location being selected and proof that there was an abundance of game to warrant the chase of either buffalo or antelope, depending on the kind of fall to be used, runners were sent out to find the game. On finding the game, a messenger was sent back to camp to acquaint the hunters that a run could be made and to prepare for it.

The grown men of the tribe were then sent out to the route of the "run", as it is now called, and hid behind the piles of rocks that had been previously placed there. These piles of rock were usually placed in the form of a large "V", the lower end of the "V" being near the cliff or bank. The wings of the "V" extended out sometimes as much as five or six miles and perhaps a mile or two apart. The piles of rock were fifty or more yards apart, depending on the nature of the country, and were sufficient to hide one man. When all was ready, the decoy began his work.

If one were to look up the antelope run located just north of the Blackfeet Agency at Browning, Montana, or visit the large buffalo run and fall that is near the Holy Family Mission, on Two Medicine River about sixteen miles from Browning, it would be discovered that the country along these runs is of a rolling nature, one rise of land following another. It would be noticed also that the piles of rock placed nearest the fall would be some distance apart.

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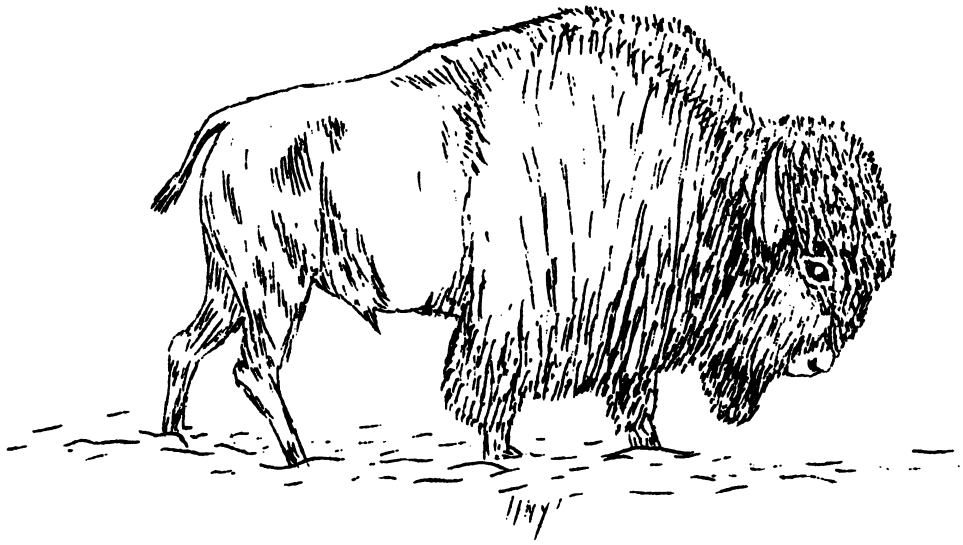
The buffalo and antelope, being very curious by nature, were the means of their own downfall. After the runners had all been placed, one was designated to act as a decoy. The game having been sighted, the decoy, carrying a blanket or anything that could be used to attract the attention of the game, went to a hill from which he could just see the quarry; rising up and waving the blanket, he disappeared as soon as the attention of the animals was gained. He did this very slowly so as to arouse the curiosity of the game, who went to see what it was all about. When the game reached the hill where they had last seen the object, they saw it just disappearing over the next hill. Not being satisfied, they followed until they eventually broke into a run to see more speedily what it was. By this time they had come within range of the piles of rock behind which the hunters were hiding. Then began the real adventure for the hunters. As the game passed, they jumped up, yelled waved their blankets, and followed after. Thus, as each pile of rock was passed more hunters entered the chase until the game was so frightened that they eventually ran over cliff or cut-bank and were killed. Here the Pikuni, men, women, and children, then assembled and skinned and ate, ate and skinned until all of the game was used up.

The Pikuni in all cases prepared for the hunt very religously by fasting, praying, and making presents to the Sun, or whatever may have been his guide in matters of religion.



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THE NAMING OF ADULTS BY THE PIKUNI

Mahkski, Park Ranger

It has been supposed that the giving of a name means adoption into an Indian tribe; this, however, is not the case. An adoption among the Indians was a very rare occasion, happening only when one had lived among them for a great many years and was literally one of them, or had done something for the tribe that was extraordinary. Many men have been known to have lived among them for years who were never made members of that tribe by adoption tho they may have been classed as belonging to that particular tribe thru association. The ceremony of tribal adoption was a very formal one. I shall not try to tell about it this time, tho I will relate of the ceremony of the giving of a name.

The giving of a name is usually attendant to the esteem that one is held by the Indians and the feeling of friendship that they have for him. This is an honorary affair, just like the conferring of a degree on a person by some college. The real significance lies in that one has the goodwill of the Indians, that no matter where he or she will happen to be they will always be called by that name by any of the Indians that know of that name and when it was bestowed.

In the giving of the name, present-day precedent is usually this: When the Indians gather for their tribal meetings or dances where there are distinguished guests present and the giving of a name is considered advisable for some thing that has been done for the Indians or they feel that an honor must be given to the person present, some one proposes that a name be given. Immediately a controversial condition exists; one's antecedents or succeedents, if I may be permitted to use that word, are passed upon and, if all agree, a name is bestowed. At one time this was considered a very great affair but due to the modernization of the Indian it no longer holds the signification that it once held.

When the board of review has passed on one that has been favorable, the selection of the name is in order. Usually the names given are appropriate to the work or profession followed. The name of a renowned warrior, hunter, chief or leader may be given, or the name of a noted woman, but the name is usually befitting.

When the name has been selected, a committee waits on the person to be named and tells him of his election for adoption, if you will, brings him up before the assembled people, stands him in front of them, and the master of ceremonies says in a loud voice: "Know ye all people, men and women, young and old, from the east, the west, the north, and the south, that by virtue of the friendship and esteem that we hold for this man and the feeling of goodwill that he has shown for us, as a token of that relationship which we hope shall always exist as long as we live, you will call him by this name. THIS IS....." Here follows the name. He is then given a push and all and sundry shake hands with him and call him by his new name.

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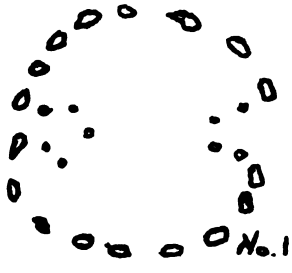
THE ROCK CIRCLES OF THE PRAIRIES

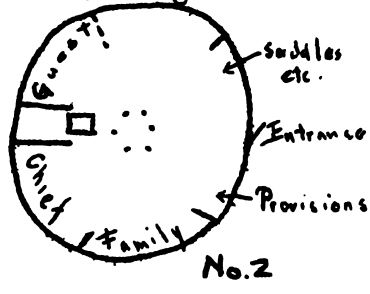
Mahkski, Park Ranger

Seated on a hill, I was looking eastward over that vast expanse of prairie stretching from the Rockies out beyond Kahtoissiks, the Sweet Grass Hills, as far as the eye could see. I visualized this land teeming with buffalo; in fancy, I roamed with the people of that once powerful nation, the Blackfeet, who at one time claimed this expanse of land as theirs, but who now are seemingly standing with their backs to the wall, the Rockies, and who now only dream of a day long and forever gone.

I was seated on a large rock that was one of a circle of rocks. Directly below me on a knoll was another such circle. As a boy I had often seen such circles and had wondered who their makers were and where they had gone. I saw these circles in Canada, as far north as the Blackfeet supposedly had roamed; I saw them at the foot of the Rockies; I saw them east of the Dakota line and far south of the Missouri River. Always I wondered just what tribe of Indians, if Indians they were, had in the past used rocks to mark their camps; I know of no Indians doing so in the present day.

A similarity exists between the placing of these rocks and the general make-up of a present-day lodge or tepee, as will be shown by the drawing. No. 1 shows the usual arrangements of rocks in the circle; No. 2 shows the inside of a lodge of the present day. It will be noticed that the rocks as placed in the circles correspond in a measure to the present-day directional practice. The door is usually placed toward the east and the chief's particular place in the lodge to the west side of the lodge.





Rarely have I seen these circles very near to a stream, spring, or lake. Most of the circles have been seen on buttes, ridges, or small knolls, in some instances miles from the nearest sources of water and fuel. Did this race of people live at a time when water was much more plentiful than now so that they had to live on higher ground?

Thus musing over the forgotten history of those who left their footprints on the sands of time, a rider approached, apparently attracted by my presence. At first I thot it was a young man from one of the ranches, but as he drew nearer I recognized who it was. Seventy-five years of living in a time of transition from the old nomadic days of the Indian to the complexities of

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present-day life had not dimmed those eagle eyes, nor bowed that tall figure, nor weakened the memory of things long past. Here perhaps was an answer to part of my musings.

"Hello! I thot it was you, but I wanted to make sure, I've not seen you in a long time."

"Yes! I'm glad you came, for there is something you may be able to tell me. Who made these circles?"

"Indians. Some believe that they were made by Blackfeet, but that is not so, for they were made long, long before the Blackfeet came to this country. They are generally supposed to have been left by the Snakes before the Blackfeet drove them from the prairie with the Kootenais, Flatheads, and Nez Perces. From their size, you can see that they pegged down rather large lodges. At the time of their placement the Blackfeet had no horses, but were using dogs to transport their outfits."

"But those circles are found as far east as the Red River, I have been told."

"That may be so, but I learned this from the old Pikuni themselves, who said neither they nor their fathers had made these circles. They foretold that altho they would leave no mark to show that they had ever been here, the new generation would leave their mark to show where they had lived. Evidently they predicted that this generation would live in houses."

Editorial Comment - Mr. Guardipee's article on rock circles found east of Glacier National Park recalls the fact that two hundred years ago the Blackfeet roamed in the Saskatchewan country before driving out the Snakes and other tribes who lived east of Glacier's borders. The Blackfeet are of the same linguistic stock, Algonkian, as the Mohicans, Narragansets, Powhatans, Ojibways, Sacs and Foxes, Arapahoes and Cheyennes.

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TILL

Mahkski - This spring there joined the Park ranger force a French-Piegan Indian named Francis X. Guardipee. Born on the Blackfeet Reservation, educated at Carlisle, his career while working for an education has been checkered. It included driving a taxi in New York City and a sight-seeing bus in Denver, appearing in the movies ("Covered Wagon", etc.), participating in a revolution in Mexico, punching cows, posing for artists, working for the American Museum of Natural History. In 1924 he became forester for his home reservation until his recent transfer to the Park Service. Handsome Guardipee's Blackfeet name, Ah-ko-in-stam-i, Chief Lodge Pole, was bestowed while making a trip with Blackfeet notables to the Shriners' Convention at Atlanta, Georgia, in 1914; but his youthful name, Mahkski, means Ugly Face. It was given to him by his grandmother a week after he was born. His adult name, given him by Two-Guns-White-Calf (the "Indian-on-the-buffalo-nickel"), the Indian judge Bird Rattler, and others, is that of his illustrious grandfather whose historic hand-to-hand conflict with the great warrior White Dog brot tears to his eyes when he discovered whom he had killed.

Peigan, Piegan, Pikuni - The Blackfeet name Pikuni means far-off robes (i.e., buffalo-robes). It has been corrupted in translation to Piegan (pronounced pē-găn), tho some authorities prefer the unaccented Peigan (pā-găn). Park place names are spelled Piegan; Mr. Guardipee prefers Peigan.

Enieotokan and Maisto - The cover with Piegan name meaning buffalo skull and raven is by the pen of Eugene Kingman, Yale '32 art student. See also July and November, 1931, covers.

Translation - The letter from Richard Sanderville (Chief Bull) to the editor (Mountain Chief) appearing on page 21 reads as follows: "Life is an arrow; therefore, you must know what mark to aim at, how to use the bow. Then draw it to the head and let it go. Your friend and tribal brother, (signed) Chief Bull."

A lone lodge within the wilderness-
Gray dusk and silence and a moping moon-
A spectral lodge, who once lived here are gone,
Their day is done, the night is on,
And there is no tomorrow.

- Mrs. Elsie E. Newton
Former Special Indian Inspector

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PLACE NAMES
of Glacier National Park and Vicinity

47 GOING-TO-THE-SUN Mountain. As the legends have it, the Blackfeet Indians originally enjoyed an ideal and happy existence in this region known today as Glacier National Park, a state which must have approximated our Biblical "Garden of Eden." Evidently, the Blackfeet were unfitted for such an Utopia, for they soon fell into evil ways.

As time went on, they were made increasingly miserable by failure in every endeavor and the additional ravages of a terrible plague. In their trouble the Blackfeet turned once again to their mystic "Creator-of-Things", the Great Spirit, who made his home on the sun. Moved by their supplications, this omnipotent "Chieftain" sent his representative, Napi, or Old-Man, down to live among his people and redeem them.

Napi came and lived among the Blackfeet. Besides ridding them of the plague, he showed them how to make bows and arrows, how to hunt and fish, how to build tepees, how to raise crops successfully, and in general how to live a "richer and fuller life."

After his work of teaching was finished, Napi made ready to depart for his lodge on the sun. And lest his people forget his works and return to their evil ways, he resolved to leave for them a perpetual reminder.

Engraved on the front of the mountain from which he made his ascension can be seen the gigantic profile of an Indian chief. This most striking face, supposedly left in the never-melting snow by Napi on this peak which rises a mile above St. Mary Lake, gives to it the name of GOING-TO-THE-SUN Mountain.

-- M.E. Wilson, Ranger Naturalist

Editorial Comment - Mr. Wilson's narrative of the legend of Going-to-the-Sun is the popular current story, requested by the editor. There are some authorities, however, who deny its authenticity and claim that it was invented by some white man. Others credited with, or claiming credit for, naming Going-to-the-Sun Mountain because of its imposing uplift into the blue: L.B. Sperry, for whom Sperry Glacier is named; George Bird Grinnell (See II, P. 12, 1929); J.W. Schultz.

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GLACIAL DRIFT

NOTES FROM

GLACIER NATIONAL PARK

1932

JUNE

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UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
GLACIER NATIONAL PARK

GLACIAL DRIFT

Volume V June, 1932 Number 4

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Eivind T. Scoyen, Park Superintendent Dr. G. C. Ruhle, Editor

Perception of Nature leads to Knowledge;
Knowledge, to Understanding, Interest, Love.

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Pasque flower in fruit.

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INTERNATIONAL PEACE PARK

Thomas Mooney, Temporary Ranger

With snow-capped mountains forming the background, citizens of two nations gathered in front of the Glacier Park Hotel veranda June 18 for dedication of the world's first international playground consecrated for peace and good will--the Waterton-Glacier International Peace Park.

The new park has been formed as the outcome of a joint meeting of Rotarians of Alberta and Montana at the Prince of Wales Hotel in Waterton Lakes National Park July 4, 1931. Following the adoption of a motion at the meeting which favored the establishment of the park, Congressman Scott Leavitt of Montana and Brigadier-General J. S. Stewart of Alberta introduced similar bills creating the park at meetings of the legislative bodies of the two nations. The bills were passed and approved, and the dedication date was set for June 18, 1932, at which time the second annual meeting of the Montana Alberta Rotary clubs was held.

The purpose of the Peace Park is best set forth in Congressman Leavitt's bill which speaks of the park as being established "for the purpose of permanently commemorating the long-existing relationship of peace and good will existing between the peoples and governments of Canada and the United States."

At the dedication ceremony, prominent Park Service men, government officials and Rotarians of both countries were the speakers on the program. Superintendent E.T. Scoyen represented Glacier National Park and Joseph M. Dixon, former governor and United States senator from Montana and now first assistant secretary of the Interior, read President Herbert Hoover's message of congratulation upon the establishment of the new park. The program was in charge of the Rotary clubs of Montana and Alberta, with Harry P. Mitchell, president of the Great Falls Rotary Club, and the Reverend S. H. Middleton, of Cardston, acting as chairmen of their respective committees. Mr. Mitchell also was chairman of the dedication program and Canon Middleton delivered the invocation.

Sir Charles Mander of Wolverhampton, England, at present a director and formerly president of Rotary International, was the first speaker called upon by Chairman Mitchell. Sir Charles and Lady Mander stopped at Glacier Park, making a side trip to Cardston, while on their way to the international convention of Rotary at Seattle. During the afternoon the Blackfeet Indians adopted Lady Mander into their tribe. Chief Two Guns White Calf bestowed upon her the Indian name meaning "Princess Bright Shining Star Woman" before a crowd of interested spectators gathered near the tepees on the Glacier Park Hotel front lawn.

During the program, musical numbers were offered by the Cardston Glee Singers and the Great Falls Associated Choirs. Patriotic songs of the two countries, sung by the entire audience with the choirs leading, opened and closed the program. King Scouts from Canada and Eagle Scouts from Montana

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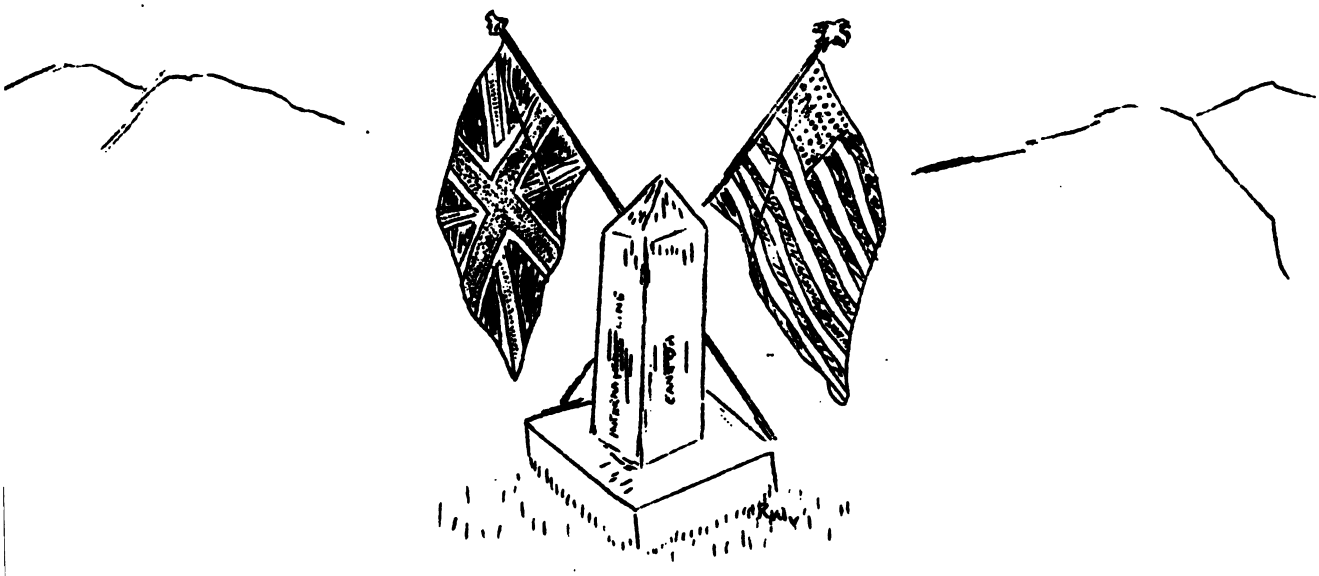
followed by a body of other Scouts from the two countries, recited a pledge in unison, following the giving of the salutes of the two organizations. The Scouts marched from the lawn below the veranda to the front of the speaker's stand where they carried out the exercises. Boy Scout and national flags of the two countries were displayed at the time.

The new park comprises an area of 1,754 square miles, which, if it were transplanted to Europe, would make a strip three and one-half miles deep extending along the entire boundary between Germany and France. Within the confines of this area are numerous lakes nestling in the shadows of towering mountains whose cloaks are snowy glaciers persisting from the last great ice age. Over two hundred and fifty of these glacier-fed lakes and countless streams and waterfalls lend to the enchanting beauty of the country. Glaciers are scattered thruout the high mountain ranges and wild flowers of every describable hue are sprinkled over the region at various times during the year.

The administration of the Waterton-Glacier park will be carried on by the separate governments just as it was before, but for all other purposes the two areas will be as one. In this way, it is thought that aside from being a permanent monument of the two countries, the Peace Park will offer a larger choice of travel to visitors.

In recognition of the establishment of the Peace Park, the bronze tablet commemorating the event will be erected at a later date along the new highway which will connect Montana and Alberta. The tablet will be placed at the international boundary, imparting added emphasis on the fact that the American-Canadian boundary is the longest one in the world that has no fortifications along it.



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BENCH LAKE

L. O. Hanson, Park Ranger

Bench Lake is one of the many beauty spots of Glacier National Park that has been rarely visited. It is located in a glacial cirque on the west wall of Waterton Valley. Its presence is rarely suspected by the tourist riding along the trail on the opposite side of the valley. It can be reached only by a strenuous climb of seventeen hundred feet, but once the upper rim is reached, the hard work of the ascent is forgotten in contemplation of the huge mountain bowl that opens out ahead.

The lake lies against the mountain at the rear of the amphitheatre. It is about three eighths of a mile in diameter, nearly round, and crystal clear. There is no visible outlet, the water escaping thru the moraine that encircles its entire front. Farther down the slope it reappears in large springs which finally unite into a stream that plunges over the rim to the floor of the valley below. The moraine marks the last terminus of an ancient glacier that once occupied and excavated the depression, and which has now completely disappeared. The diorite band which appears in the Siyeh formation thruout the Park is well exposed in this region. Broken pieces of this ignious rock are scattered all around the shore and on the moraine.

Grassy plots covered with flowers and groves of Alpine larch, spruce, and limber pine scattered here and there gives the bowl a park-like appearance. It appears to be a favorite haunt for grizzly bears, for I saw two of these big beasts digging for bulbs and gophers near the lake. Like others of their kind, they showed not the slightest inclination to attack me, but shuffled off a short distance and watched me until I was out of sight.

Like hundreds of similar unvisited hanging valleys existent in Glacier Park Bench Lake offers possibilities for an interesting and profitable day for him who loves to wander off the beaten path and explore the hidden nooks of this natural wonderland.

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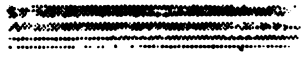
SHOCKING BEARS

G.C. Ruhle, Park Naturalist

Late in fall six years ago I made a fishing trip into the Hetch-Hetchy region of Yosemite National Park. At the foot of the reservoir stood the cabins of the laborers who had constructed the dam. Bears were there too, but all bore a disinterested, if not disgusted look even for the cabin in which hung hams, bacons, and other bruin delectables. There certainly was a reason for this curious anomaly in the state of affairs. If truth were to be told, all of the bears had been quite shocked into a remarkable respect for the integrity of the cabins. Wire screens and special metal protective strips around doors and other openings had been connected to high potential sources of electricity. In earlier days, each expectant bruin, foraging about for a lickerish prize, had touched a wet nose to these shocking devices to complete a circuit to the earth to receive the extreme surprise of his life. Without exception, every bear exhibited a thoro-going and permanent disapprobation of the sensation.

Glacier Park road and trail camps have always been seriously annoyed by prowling bears. Cognizant of the effectiveness of the above, window openings last year were crossed and recrossed with steel bars, frail indeed, but connected with a deterrent series of batteries. The palliative has been most successful. One shock is always enough to send bruin precipitantly and permanently back to his most secluded retreat.



Supersession - A few weeks ago, a whistling marmot moved down from his home among the rocks to take up his abode under the Cutbank Ranger Station, driving out a few squirrels that lived there. He stayed for a few days only, moving out most hurriedly. A few nights later, I was awakened by a peculiar noise in the room. A flashlight disclosed a large porcupine a few feet from the bed and uncomfortably close to my favorite boots. Under a shower of magazines, he was shooed out into the night to take refuge under the cabin. Perhaps his presence there was the reason for the marmot's precipitant departure. - Harry W. Doust, Park Ranger

Summer Home - Many a vacationist has returned to his summer home in the early year to find it in a sad state of disrepair after the severity of winter. Ospreys are known to cling firmly to one summer home (See NATURE NOTES III, 30). A pair that nested on top of a snag near the mouth of Olson Creek, however, were compelled to build a new nest this spring. They had attempted to restore the old home, which was badly damaged by the storms of last winter, but a severe blast early this month nullified their labor. Discouraged from another attempt at restoration, a new nest was constructed. A pair of ospreys, presumably the same one, had nested in the old home for ten years or longer.

- L. O. Hanson, Park Ranger

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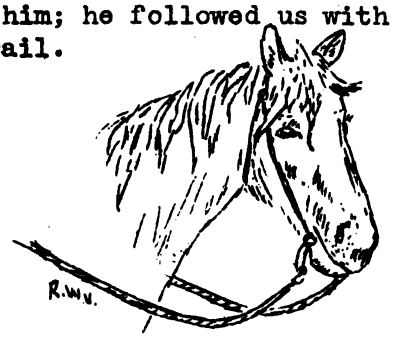
LET'S GO HORSEBACK
(Part III)

Morton J. Elrod

Most horses do not like to be left behind on the trail and will make it very uncomfortable for a rider who wishes to loiter to take pictures or collect other material. I was once going over Gunsight Pass from the eastern to the western slope. At the particular spot that seemed to be the highest part of the trail on Mount Jackson, I decided to take some pictures. It was a grand sight in every direction. In a back pack I was carrying a six and one-half by eight and one-half camera, a heavy tripod, nine double plate-holders, and a series of lenses. The whole weighed forty or forty-five pound I dismounted, but could find nothing to which I could tie the noisy and prancing horse. I found also that I could not mount again with the heavy and bulk pack. Losing my temper, I tied the reins and hooked them over the pommel of the saddle and told him to hustle and catch the party if he was so crazy abou it. And I am stating that he went up the trail in a hurry. It did not disturb me until I was thru with the work of taking pictures, when I discover that the trail descended about 500 feet, again to make an ascent to the pass. And from the pass I had a descent of 1,200 feet to camp. The pack was heavy by the time I reached camp, and my disposition was not quite as good as when I dismounted far up the side of Mount Jackson.

Just the opposite of the disposition above given was experienced with a fine little bay mare that I rode on one of the trips to the north end, then over Brown Pass, down to Bowman Lake, and back to Lake McDonald along the old road on the west side. This mare became friendly, assisted by an occasional lump of sugar, and would never leave, no matter how long I was in taking pictures. Indeed, it often happened when I sat down to fix something about the camera or plate-holders I would hear footsteps coming up behind, and the little nag would stick her nose over my shoulder as tho to ask what I was doing. A gentle rub on the nose and a lump of sugar, if I had it, was all th pay she wanted. Another time I had a fine gray horse, Charley, that I rode for about four weeks. When we started I was told he was well broken to ride. I do not claim to be anything but an ordinary rider, and do not wish to start out for a period of time with a doubtful horse. When I returned at the close of the summer I found he had been ridden only three times before I took him, yet he was one of the best horses I have ever had. The last thing I did before leaving was to walk far back on the trail to the corral to say good by to Charley and some of the other horses. He recognized my voice at once, cam across the corral, submitted to a bit of nose rubbing and tasted the last bit of sugar I was to give him; he followed us with eyes until we disappeared around a bend in the trail.



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TILL

Article of Diet - Not only porcupines (GLACIAL DRIFT V, 7), but also deer seem to relish a bit of tar paper with their regular articles of diet. Mule deer ate up half a roll of tar paper that had been cached on the veranda of Rainbow Chalet at the foot of Bowman Lake. Two bales of hay stored with it remained untouched. - B. C. Miller, Park Ranger

Discrimination - Every year the Park Service is annoyed by bears' apparent dislike of signs. Fire trails on the west side, marked every fifty yards with bright yellow discs to do away with blazing on trees, become littered with them as bears paw them off. Last month Ranger Fauley at Two Medicine reported a grizzly that had taken a swipe at every sign as he passed along. Such oft-repeated indulgences provoke the ire of the most mild-tempered man whose duty it is to restore them. Quite the opposite was affected by the Belly River bear that with fine discrimination demolished signs reading "It is dangerous and it is prohibited to feed the bears," but left all others untouched.

Grebes - Waterfowl life on Lake McDonald is interesting indeed in early spring. On April 22, the lake was desolate; on April 25, horned grebes by the thousand dotted its surface, singly, in pairs, or in groups of ten or more. Two flocks, each numbering by actual count over five hundred, swam about a mile below the Sprague Creek Camp Ground. Graceful swimmers, these birds are like others of their type. They walk or run on the water for a considerable distance before getting under way in flight. Once in the air, they are quite speedy, but a flock of five hundred or more trying to take off at once present an amusing sight worth witnessing. - C. L. Croghan, Asst. Chief Ranger

Bird Recordings - The following birds were noted at Belton for the first time this year: May 4, Magillivray warbler; May 5, Northern violet-green swallow; May 9, red-eye vireo; May 11, spotted sandpiper; May 13, Cassin purple finch and fox sparrow; May 23, olive-backed thrush and Louisiana tanager; May 25, warbling vireo; June 2, olive-sided flycatcher.

Floral Splendor - Rushing streams and temporary waterfalls tumbling over steep cliffs characterize Spring at Two Medicine and play their part in the setting for the Annual Drama of Passing Seasons. Sweeping are the roles in the early year, for the vernal season is abrupt and very brief. Countless glacier lilies, pasque flowers, buttercups and fritillarias flash where snowdrifts shied under the sun's caresses a few days earlier. Natural rock gardens, agleam with an abundance of carpet pinks, streak with splendor the flanks of ridges whose feet are tucked in the rose purple of yellow-eyed dodecatheons. - C. C. Fauley, Park Ranger

Fish Food - I discovered a spring pond swarming with Gammarus Linnaeus, the largest amphipod of the four important species to be found in the United States. This crustacean is a perfect little shrimp, and is used as fish food at Gremaz, France, a noted and important trout-farming region. There is no record of its being found in Glacier National Park before.

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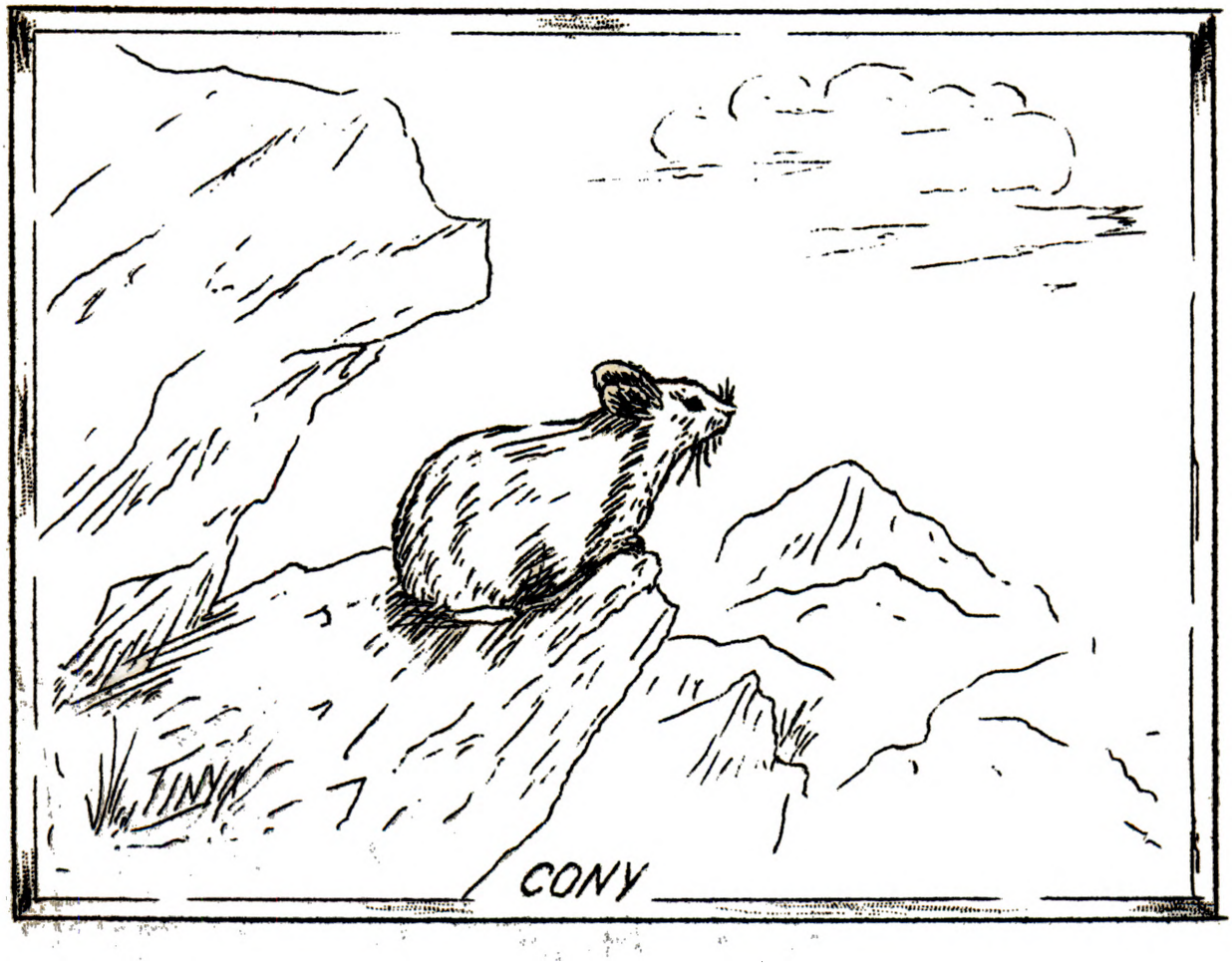
GLACIAL DRIFT

NOTES FROM GLACIER NATIONAL PARK

1932



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GLACIAL DRIFT

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GLACIER'S 1932 STAFF OF RANGER NATURALISTS consisted of the following: Dr. W. T. McLaughlin of Northwestern University, Harold E. Bailey of the University of California, W. Stephen Thomas of Harvard, Marvin E. Wilson of Stanford, E. A. Flottman of Flathead County High School (Montana), all of last year's staff; John LeRoy Arnold of the University of Pennsylvania and last summer's Yosemite Field School; John Cannon of Williams and Cornell, field assistant to William Beebe on his celebrated Bermuda deep-sea expeditions in 1930 and 1931; John Thompson Emlen of Cornell, formerly on the staffs of the American Museum of Natural History in New York and the Philadelphia Academy of Sciences, for whom he went on collecting expeditions to Honduras in 1929, to the West Indies in 1930; E. A. Spingarn of Bowdoin College who has collected birds in Labrador and has served under Mr. Scoyen in Bryce Canyon National Park; John S. Trembley of Indiana University, who has conducted nature study work at Culver Military Academy for some summers past; Louis Wessel of the University of Oregon, a nature-study pupil of Dr. Wm. G. Vinal; Russell Grater of Wabash College and the Yosemite Field School, information ranger at Two Medicine, assigned by Chief Ranger Dissmore to assist the work of the Educational Department there.

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GETTING ONE'S GOAT

W.T. McLaughlin, Ranger Naturalist

In the western vernacular "getting one's goat" may have more than one meaning. For example, it may refer to the disturbance of mental and spiritual complacency, such as is brought about, for instance, by taking one's wife on a fishing trip for the first time and, after you have explained just how she should cast and play the fish, to have her land the big ones while you fail to draw even a nibble.

To the photographic enthusiast, whether he be equipped with a two dollar box camera or a two hundred dollar outfit, "getting his goat" means the ultimate in photographic endeavor in this park; it means a close-up of a Rocky Mountain goat in his native haunts.

And what haunts they are! Thousands of visitors each year ask the ranger naturalists where they can see a goat. If luck is with them and they see thru field glasses a moving speck of white, high up in the crags, they are apt to feel assailed by doubts as to the actual existence of the interesting quadruped climbers. How little they appreciate the effort, the luck that enables one very occasionally to get within camera range! And yet if one is willing to make the effort it is quite possible.

Once up in the remote crags, the goats seem to feel fairly secure and inaccessible to their enemies. What a thrill it is to have climbed laboriously for hours up some precipitous wall in an out of the way corner of the Park and, on pulling oneself over an especially difficult ledge, to come face to face with a nanny and her kid as they feed complacently on the dwarf sedges and alpine willows. She faces you head up for an instant. That is your chance. If you are quick enough, you may get one picture. It is almost axiomatic that it will be only one. Then, enervated by a common impulse, nanny and kid are off on a gallop, up and over the slide rock slope, kid ahead, running for all his seven weeks as tho he had spent a long lifetime among the dizzy heights. As you watch you are astounded to see them continue directly across the face of what had appeared to be a vertical wall. While mounting higher, the nanny stops now and then upon some prominence to see if you are following. If you are wise, you won't.

Up on Mt. Edwards, near Sperry Glacier, alternate layers of white quartzite and red argillite have been twisted into a series of remarkable folds. By the action of frosts and rain, the rocks have become weathered, as the argillite is more easily eroded than quartzite, there is a series of ledges, following the lines of the folds, and yet having a nearly vertical face. One morning, as I was waiting for a party which was to be guided over the ice fields, I saw an old billy goat slowly making his way up over the folds and down again. It reminded me of a small boy and a roller coaster.

One clear day in early September, I was picking my way carefully along the trail which skirts the head of Bowman Valley. According to the topo-

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graphic map, it is two thousand feet to the valley floor -- not all a sheer drop, but sufficient, I judged, so that an object once started rolling would stop only at the bottom. At one point there is a dry draw with an overhanging wall above. Just at the moment when I approached this point, a stone, the size of one's fist, hurtled down, fairly singing as it flew by a few feet from my head. I turned and ran back, thinking I should thereby avoid a possible avalanche, but found myself in the midst of bounding rocks of all sizes. There was no ledge to crouch behind. I did the only think I could do, I kept going. Somehow, I escaped being struck; and, with knees a bit wobbly, looked up to see two goats running along a ledge above me. I had startled them. In their haste, they had precipitated the rocks upon me. That is one theory, but it may be false. I had been chasing goats, disturbing their peace of mind, all summer long in an endeavor to get close enough "to get my goat." Here was their chance for revenge. They saw me and noted that it was I who had been a bane to their tranquillity, so they deliberately waited until I was below them and then showered those rocks upon me.

THE WESTERN WINTER WREN

E. A. Flottman, Ranger Naturalist

Surely no naturalist can boast of a more fitting climax to a nature walk than the one found on the Sprague Creek Nature Trail. When seventy-five yards from the end of our walk, the members of the party are greeted by what Vernon Bailey calls the "watch-winding scold" of a stubby tailed Western Winter Wren. She scolds and sings her tinkling melody in turn as she accompanies the party to the end of the trail, keeping most always on the dead burn timber along the bank of the creek. So pert and so attractive is she, and so appealing is her song, that it is difficult to further interest tourists in anything else. "Such a dapper, fidgety, gesticulating, bobbing-up-and-down-and-out-and-in little bird, and yet full of sweet, wild melody!" is John Burrough's description of the Winter Wren. So in keeping are her actions with her music that she would put the most renowned of classic dancers to shame.

Her nest is under a pile of decaying logs near the point where she greets us. To see it, one would need to enlarge the opening leading to it, and this I have dared not do for fear she would leave the neighborhood of the trail. Time and again tourists have told of going back up the trail to sit and watch the wren and to further drink their fill of her tinkling sweet, wild melody. In all probability it was the song of the wren that Thoreau failed to identify when he likened it to "a fine corkscrew stream issuing with incessant lisping tinkle from a cork, flowing rapidly, and I said that he had pulled out the spile and left it running."

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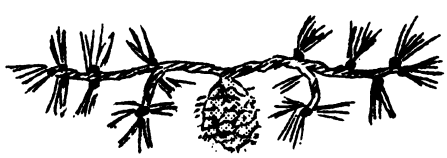
HOW THE TREES CAME TO GLACIER PARK

H.E. Bailey, Ranger Naturalist

Glacier National Park is distinct in the type of plant life which it contains. It is the southern limit for many plants of Canada, and the eastern limit of many Pacific Coast forms. It is little wonder that botanists come from all over the world to collect and study plants here. The Park is becoming a classic field for botany just as it is already in the geology. The forests of the Park are particularly peculiar because of the small number of kinds of trees and shrubs which it contains. There is no native oak, hickory, elm, walnut, chestnut, sycamore, or locust. The species of birch, alder, maple, plum, cherry, and hawthorn, so abundant in the eastern states, are represented here by a few inferior species. If reason for this be asked, the answer can be found only by going back to ages long past.

The organic remains of the trees, preserved as fossils in rock, offers us the first and most important clue in solving the question. "The vegetation has changed many times in the course of the earth's history, but scraps of its green mantle are strewn among the rocks as so many natural archives." From these may be reconstructed the ancient history of the forests of Glacier National Park.

In early Cretaceous times, all North America was covered by forest. Later in that same period, an arm of the sea extending from the Gulf to the Arctic cleft the continent in two. During this time, there developed a marked differentiation of the eastern and western flora. Still later came an uplift and glaciation of the region. Lastly there pushed into the unoccupied area the plants from the two principal regions which had not been glaciated. From the Pacific Coast came the grand fir, the Douglas Fir, the western larch, the white pine, the hemlock, the arbor vitae, the yew, and the black cottonwood. From the distant Appalachians, came the balsam cottonwood, the aspen, the paper birch, and the hawthorn. The Engelmann spruce, alpine fir, yellow and lodgepole pines are remnants of an old flora indigenous to the region. Pushed down from the Northland by the great Ice Ages came others of elfin stature which have since retreated to the cold mountain tops as a warming climate made lower elevations tenable to warmth-loving plants. As we gaze upon the glory of our forests, we seldom think of their past history or of the reasons why or how its individuals came to be present. This presents a most fascinating aspect which engages the minds of those researchers who yearly make their pilgrimage to such places as this Park, where individuals advancing from different forest sectors clash with each other.



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Dodecatheon

TWO MEDICINE TRAILS AND FLOWERS

J. L. Arnold, Ranger Naturalist

Two Medicine Valley has much to offer to those interested in natural history. The charm and quietude of its peaceful setting may be sufficient reason for extending a casual visit to several days or even weeks. The real beauty is, however, revealed to those who explore its many alluring trails. Each of these leads you into regions of diversified natural interests, whether it be along the wooded shoreline of the lake leading to Twin Falls, or to the more distant summit of the Continental Divide. Along each trail one experiences new delights in discovering the many interesting phases of the flora, the fauna, and physical features of this region.

The flowering plants are among the first features to attract the new arrival. The highway leading into the valley takes you thru a region abounding in native flowers. The artistic blending of the many varieties frequently prompt the visitors to inquire whether they have been planted by man. Here the lupine, Indian Paintbrush, gaillardia, bear grass, and stately hollyhock greet you in such splendor and beauty as to rival any man-made garden. In order to see Nature's most choice offering in flowers, one must leave one's car and follow the trails leading into less frequented areas. Along these, one finds the cheery queencup, intermingled with the fragile lace-flower, the bright blue bur-forget-me-not, the thimbleberry and the colorful pink spiraea. The array of bloom furnished by the twinberry, service berry, chokecherry, and whortleberry give promise to a bountiful supply of fruit for both man and beast.

The real treat to the lover of wild flowers is to come upon one of the delightful rock gardens which cover the exposed mountain slopes. The most interesting of these is located on the north shore trail leading along Two Medicine Lake. Here on a rising slope over-looking the crystal blue waters of the lake with the precipitous slope of Rising Wolf as a background is as delightful a flower garden as one could wish for. Nature has even furnished the inevitable stream and cascade waterfall to complete the setting. In this small area of less than one acre, one can easily find at the mid-season fifty or more varieties of flowering plants. The natural blend of their many colors would satisfy even the most critical landscape gardener.

An alpine rock garden is another interesting find. The more hardy hiker may visit the delightful gardens found on the summit ridge of Mount Henry or the crest of the Continental Divide of either Dawson or Cut Bank Passes. The latter regions excel in the glacier lilies, mountain pasques, dryads, gentians, and the alpine saxifrages.

It is always interesting to see how nature removes the scar left after a destructive fire has swept a wooded region. Such a scene may be witnessed by following the Cut Bank trail thru Dry Fork. Altho the ghosts of a former former forest are still still standing as a grim reminder to man of his carelessness, nature has made remarkable progress in covering over those burnt scars. The green foliage and the many flowers give one a reassuring feeling

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of the better things in life. One can forget the damage of the former by the bright colors cast by the many flowers along this trail.

Should we be so fortunate as to have another season of sufficient rains, the region of Two Medicine Valley will offer to the next year's visitor a display of flowers seldom seen here before.

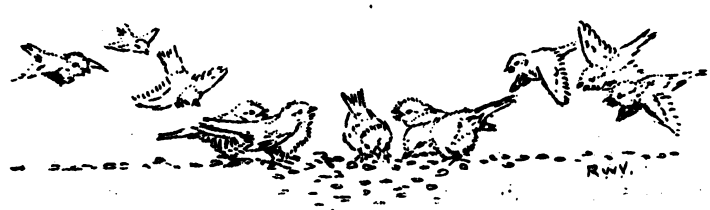
.....

FIRST AID

John Cannon, Ranger Naturalist

Of late, a pernicious disease has been gripping large numbers of visitor to the National Parks. The symptons are very apparent, but most painful to both patient and doctor. The approach of the disease is marked by an ever increasing desire to hurry thru wilderness areas. In most acute cases, the affected stop only to collect a sticker for his car, like a cony in a frenzy of collecting grass before the snow flies. The main attack of the disease is accompanied by severe apathy to all wild life and natural beauty. If lured onto a trail, the patient walks as one thru a gigantic zoo. He expects the whole array of wild animals should pass before him along the trail, since he has condescended to step out of his way to get out of his car to see them. Several cases under the observation of the author had the rare privilege of seeing a black bear getting the best of a hot afternoon in a high snowbank above Grinnell Lake, of a flicker feeding its young, of an osprey plunging down to catch a fish from Swiftcurrent Lake. The reaction was one of extreme complacency, of expecting that and more as their due. The mountains a half-billion years old, the splendid peaks of many colors splashed with bluest of lakes and crowned with glaciers are passed up without a flurry. Such are the ravages of this disease.

Sometimes the cause of it is an acute indigestion from too big a helping of scenery and wild grandeur from the feast of mountains laid out in this western land. To offer first aid to these wretched ones, to help them assimilate the banquet, to produce that feeling of having partaken of something tremendously worthwhile, is the work of the naturalist service. Cures are being affected daily. Preventative measures are being taken to check the spread of the disease which is slightly contagious. With such fortification the tourist can go safely through the parks in perfect health -- and appreciation and enthusiasm.



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FEEBLE FOLK, BUT WISE

W. Stephen Thomas, Ranger Naturalist

More than once, a sincere but misinformed visitor to Glacier National Park has asked a ranger naturalist where he could find the zoo or the place where the animals were caged and held available for inspection. It so happens, however, that one of the outstanding charms of our National Parks is the very fact their wild life populations are, except in rarest incidents, uncaged and allowed to roam and carry on their lives as in the day before man came to upset the balance of nature. But there are certain animals. perhaps abundant, which, because of their peculiar habits, are seldom seen by the casual tourist. In this Park, one such creature is the cony, alias rock rabbit, alias hay-maker, alias pika, alias little chief hare.

Any naturalist, or for that matter any outdoor person familiar with the Rockies, will know well this small member of the rodent tribe which is so unique it is neither rabbit nor rat, nor anything else readily recognized, but forms a family all by itself. Nevertheless, one is astounded at the number of newcomers to Glacier who have never heard of a cony. It is entirely fitting then that the new tent museum at the Many Glacier Camp Ground should have a live and contented cony as one of its prize exhibits.* Many were the comments of naturalists and others to the effect that this small, seven inch captive would not survive many days. But thanks to the care of Ranger Naturalist Harold Bailey, in charge of the museum, the cony has not only taken to captivity but thrives on its varied diet of green things, ranging all the way from spirea buds to alpine fir needles. Often a visitor will find it hunched up in the posture of a fire-side tabby, secure in the shelter of its little shale house within the cage. If disturbed, it will run about its enclosure rabbit-like and nervously jerk its head in true cony fashion. Again, it appears to become intensely exhilerated and bounds about the cage, springing against the glass and exhibiting all the technique of a highly experienced jumper.

There is many a pile of talus or broken shale in the Many Glacier district where an alert observer can see conies at any time of the day, providing he possess just a fraction of that spirit which made a Henry Thoreau stand for hours knee-deep in a swamp to hear a bullfrog croak, or a John Muir to hike a thousand miles to the Gulf of Mexico to collect plants. If one makes a practice of visiting a cony colony at regular intervals and remains quietly for long minutes, curious habits of the animals will reveal

*To be released after several weeks of "pleasant captivity" for lecture and other educational purposes are three smaller mammals, a cony, a pack rat, and a flying squirrel. Very few visitors see these interesting individuals alive and in natural habitat. All three have become great pets. - Ed.

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themselves. It was my pleasure to watch such a cony community over a considerable period last summer behind the Many Glacier Ranger Station. Generally, three or four of the animals were out at a time, some apparently on guard, others venturing beyond the rocks to neighboring tangles of grass and bushes from whence they dragged tid-bits of leaves and plant stems to pile in their miniature hay-mows. And it is this unusual capacity for laying away winter provisions that marks the cony from most other animals. As in the case of the beaver, storing his willow branches under water, we wonder what is the secret behind this peculiar wisdom.

Equally significant is the cony's custom of locating its runways among the tumbled rocks for protection from a host of enemies. We can easily see how its small furred body, provided with no adequate defense, could fall prey to anything from eagles to weasels. Last year, I watched just such an invader of this same cony village. As I observed two of the conies scampering over the rocks, one of them uttered its piercing cry and dove beneath ground at the same instant as the rest. Immediately, a slim, brown-furred body, white underneath, an Arizona weasel, shot like a streak across the tumbled shale and dashed into one of the burrows. The animal reappeared in no time and was off in another direction, apparently thwarted in his pursuit. Whether it was the singular construction of the cony apartments, or their own agility that saved them is a question. There is no doubt though that when the Old Testament writer said, "The conies are a feeble folk but they build their homes within the rocks" he not only pointed a moral, but told a zoological truth.

INGLORIOUS RETREAT

W. T. McLaughlin, Ranger Naturalist

At least two parties have reported seeing a moose cow with two calves above Trout Lake, but two employees of the Lake McDonald Hotel had something more to report than merely seeing her. It was near the beaver meadows above the lake. They heard a crashing of timber. Suddenly a moose calf appeared, waded thru the stream and disappeared. A moment later, a head emerged from from the thicket to be followed by the body of the cow.

"Look out; she's going to charge!" There was nothing to do but to take to the nearest tree, which was done with alacrity. While the cow pawed the ground, seemingly bent on seeking revenge on these creatures who had somehow disturbed her calf, there was a bustle in the branches and camera shutters clicked.

After a time, the moose wandered away, and the refugees dropped to the ground. But the cow was not done with them yet. Back she came, and once again the tree became a haven of safety. When she wandered away a second time, the opportunity was employed to cautiously steal to the ground. The retreat was effective, if somewhat inglorious.

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BITS FROM AVALANCHE CAMP

L. Wessel, Ranger Naturalist

Five hundred and eighteen visitors in one hundred thirty eight cars came to the parting of the waters at Logan Pass on Sunday, July 24. Of these cars, ninety-eight carried Montana licenses, twelve were from Washington. ten from California, two each from Minnesota, New Jersey, New York, and Utah, and one each from Oregon, North Dakota, Wisconsin, Missouri, Nebraska, Pennsylvania, Massachusetts, Illinois, Maine, Georgia, and Key West, Florida -- a fair representation from all parts of the country. The following are approximate figures of the questions asked: What flower is that? 324; what animal is that? 224; what tree is that? 24; do you live in that house all the time? 108; what is that house for? 108; are there any bears here? 89; where are the goats? 99.

A classification of the activities of the visitors at Avalanche Camp on the evening of July 25 shows that thirty four attended the lecture at the camp fire. There was a total of fifty-three campers in nineteen cars, besides two hikers. The two hikers returned to camp at eleven o'clock, after hiking from Logan Pass to Gunsight Pass and thence back by the way of Sperry Chalets. One couple returned at eleven after a drive to Kintla Lakes; a party of four returned about the same time after a day's fishing in Trout Lake; one group of five finished supper about ten and immediately retired -- they had had a daylight to dark outing to Avalanche Lake; two young couples (suspected of honeymooning and camped a quarter of a mile from the camp fire circle) let the rest of the world go by in blissful oblivion; a party of four (the bears had paid them a visit early in the evening) devoted the night to heaping anathema upon all of the otherwise noble and highly respected tribe of Bruin; finally, one individual remained to guard his tent while his partner attended -- they take turns about guarding their worldly possessions against ursine depredations, and drinking deeply from the fountains of knowledge nightly on tap at the campfire.

On the evening of the 23rd of July, a mother bear for the first time, as far as is known, brought her twins to camp to acquire a touch of the influences of civilization. She ripped open the tent of a harmless citizen, presumable to show her young hopefuls how white men live when they are overcome by the primeval urge.

In a heterogeneous group such as one may find about any National Park camp fire, one can't always tell by looking at a frog how far he can jump. On the evening of July 21, our evening circle was treated to a most interesting account of Europe's mountains and glaciers by Dr. Maurice Becker, of the National Physical Laboratory, London, an alpine enthusiast. In these days of the slogan "See America First", when we wonder why so many well meaning Americans will insist upon spending their good time and money over-seas, it is refreshing to know that occasionally the tables are reversed. Dr. Becker is spending several months with his wife "seeing America" incidentally climbing a few peaks

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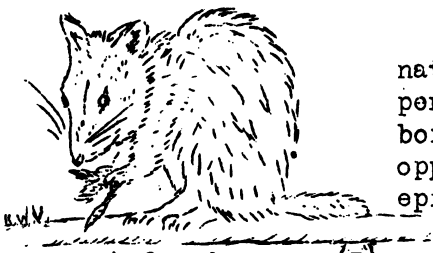
FISHERMAN'S LUCK

Russell Grater, Temporary Ranger



Doubly fortunate is the person interested in natural history who has occasion to personally experience some interesting contact with his wild neighbors, but fortunate, also, is the person who has the opportunity of hearing of some interesting wild life episode.

A few days ago I was seated at my table writing when a young man entered and asked if I could assist him with a problem which was causing him no little amount of speculation. It seems that this young man decided to go fishing at Cobalt Lake, and had gone with his lunch and a pack to that region. Upon arriving at the lake, he put his pack upon the ground near a rock wall, and upon this pack he placed his wallet containing all his extra flies. For a few minutes he fished, but experienced no luck. Deciding that perhaps he might have more success if he tried a different fly, he came back to his pack to procure another. However, presto!, during his absence his wallet had disappeared! Search as he might he was unable to find it, and he was ready to hurry back and report a theft when he saw a piece of paper near the talus slope. Upon examining the paper he found it belonged to him, and had been in his wallet. Looking farther on he saw one of his lost flies, and, beyond that, still another. After picking up several flies, he came to the end of the trail at the foot of a huge pile of rocks and debris -- and there was his wallet -- or what was left of it! It had been almost completely chewed to pieces.

That was the story as told to me. I explained to the young man that he had, without doubt, come in personal contact with one of our most interesting forms of small animal life, and told him the name of his "four-footed thief." And so another interesting story of the peculiar habits of the gray bushy-tailed woodrat -- popularly known as trade rat or pack rat -- has been recorded.

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GLACIAL DRIFT

NOTES FROM GLACIER NATIONAL PARK

SEPTEMBER
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1932

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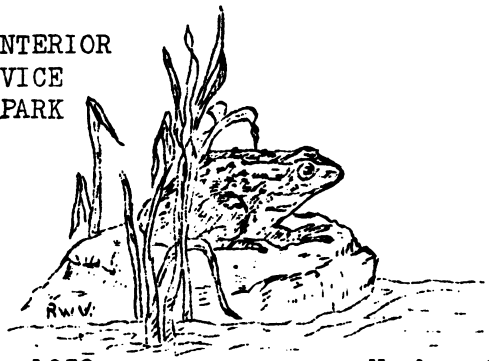
UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
GLACIER NATIONAL PARK



GLACIAL DRIFT

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A popular pamphlet edited by the Park Naturalist and distributed gratis from time to time by the Educational Department of Glacier National Park to persons and organizations interested in the Park and its natural history.

Eivind T. Scoyen, Park Superintendent Dr. G. C. Ruhle, Editor

Perception of Nature leads to Knowledge;
Knowledge, to Understanding, Interest, Love.

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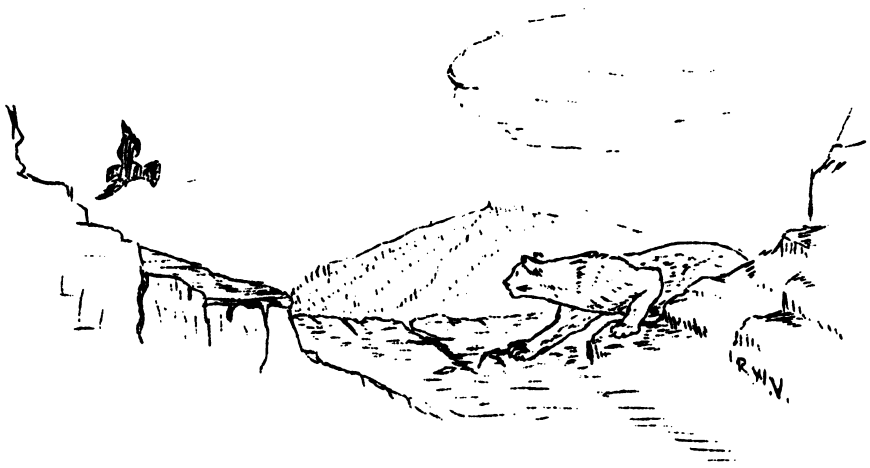

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THE SOURCE OF GLORY

Dr. John C. Merriam

The parks may not be pictured solely in a setting of science as it is commonly known. In ways we can define only imperfectly they express peculiar elements of beauty and grandeur which lie beyond the realm of formally associated facts and logic. Partly does this attractiveness reside in that which stirs emotions thru influence of aesthetic and artistic values, partly it is recognition of sublimity in the power and order behind nature.

I remember standing last summer facing the great mountain range at Glacier Park, thrilled with the living charm of forest and meadow and the cold brilliance of snowfield and glacier. But behind the splendor of this mantle over nature there was clear revelation of the movement of creation--shown in the body of the range which had been lifted and thrust forward many miles above the level of the plain on which I stood. This act of building was the source of glory in the mountain. The overwhelming bulk and strength of cliff, with appeal of lake and glacier, represented only residual evidences of power exerted in this great work. And the garment lost nothing of its beauty thru knowing of the majesty it clothed.

While the National Parks serve in an important sense as recreation areas, their primary uses extend far into that fundamental education which concerns real appreciation of nature. Here beauty in its truest sense receives expression and exerts its influence along with recreation and formal education. To me the parks are not merely places to rest and exercise and learn. They are regions where one looks thru the veil to meet the realities of nature and of the unfathomable power behind it.

I cannot say what worship really is--nor am I sure that others will do better--but often in the parks I remember Bryant's lines, "Why should we, in the world's riper years, neglect God's ancient sanctuaries, and adore only among the crowd, and under roofs that our frail hands have raised?" National Parks represent opportunities for worship thru which one comes to understand more fully certain of the attributes of nature and its Creator. They are not objects to be worshipped, but they are altars over which we may worship.

(A great and potent friend of our National Parks, famed Dr. John C. Merriam, President of the Carnegie Institution of Washington, included the above declaration in his "The Responsibility of Federal and State governments for Recreation.")

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REPORTED MOUNTAIN LIONS

G. C. Ruhle, Park Naturalist

Mountain lions play a part in many western tales, most of which are as wild as they are imaginative and untrue. A mountain lion, borrowing reputation as well as name from its African distant relative, conjures up hallucinations of ferocity and danger that it cannot do when designated by other milder terms such as painter, panther, catamount, cougar or varmint. Knowing people appreciate not only that these powerful but harmless animals are extremely scarce, but also that they realize the necessity of their keeping out of sight of the killer, man. Lions are seldom seen in the wilds unless hunted down with dogs.

Every red-blooded American wants to see a mountain lion which is not behind cage bars, even if only for the certain amount of distinction and prestige that is gained by such observation. Ofttimes desire to see one increases one's faculty of imagination and stretches beyond the limit of error faith in one's keenness of perception.

Lions, once plentiful in Glacier National Park, have all but completely vanished following repeated campaigns to exterminate them in behalf of the deer population, a policy no longer in favor with the Park Service. In 1922 alone, Biological Survey hunters killed twenty-four in the Park. An estimated total of seven were reported in the Park at the time of the last game count; but, as lions are great travellers, there is no assurance that one lion may not have appeared in several districts to be counted as two or more. This conjecture is strengthened by the fact that thruout the season no two rangers reported the presence of a lion in their districts on the same day. For the same reason, it is not likely that the appearance of a lion in a district would be overlooked in wintertime, for every ranger crosses and recrosses it many times on patrol. No animals, but only their signs, have been reported as seen by rangers since August, 1930 (See NATURE NOTES, III, 69). The park naturalist conscientiously believes that there cannot be more than three individuals now living in the Park, and these may or may not divide their time with adjacent National Forests.

Carefully weighing all evidence and circumstance, it should truthfully be stated that considerable doubt must becloud reports of the seeing of three lions in the Park during the past summer. One was reported within a quarter of a mile from Headquarters, being seen in broad daylight. A party of hikers told the Waterton ranger that they had seen "two small lions in the basin east of Indian Pass."

On three different occasions last July, three Park Saddle Horse Company guides independently reported seeing caribou on the Skyline Trail between Fifty Mountain Camp and Granite Park. - C.G. Harkins, Park Ranger

Former Park Ranger Paul Schoenberger reported the presence of a caribou on his North Fork (Flathead) ranch last June.

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THE INITIAL FLIGHT

C. G. Harkins, Park Ranger

Mushroomed on top of a snag on the west shore of Swiftcurrent Lake, an osprey nest with its drama of life held my attention all last summer. Three young ospreys saw their first light of day there; three survived the precarious days as fledglings. In due time, the naked bodies became covered with plumage and the trio grew to be as big as their parents. The time for a new episode of life was at hand.

With apprehensive uncertainty, the three clung erect to the edge of their lofty perch. They whistled shrilly in reply to the plaints of their parents above, redoubling the clamor every time one of the latter appeared in sight with a fish. Growing birds, like growing children, require much nourishing food, so are always hungry. One day there was extra rumpus. One youngster had gathered sufficient courage to slide off the edge of the nest into abysmal, forbidding space. The wings were spread; it was soaring away thru the air. Soon the other two followed, and the heavens were filled with their loudly whistled happiness.

Young birds of prey seldom return to their nest after the initial flight. Only one of these young returned to the beetling castle of sticks once it had left it.* And certainly this maiden flight must be the most thrilling of all events of the osprey life, even more so than that first swoop after a fish.

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*In 1930, the park naturalist observed ospreys to return to this same nest at least two weeks after the initial flight. He did not observe whether they returned nightly to roost. Ranger Naturalist John T. Emlen, ornithologist from Cornell University, reported to the park naturalist that the young ospreys at the head of St. Mary Lake did so last summer. For some information on the life history of the osprey, see NATURE NOTES III, page 30.

The number of goshawks at Two Medicine is remarkable. I foresee a precarious existence for rabbits during the coming winter.

- Clyde C. Fauley, Park Ranger

In Martha's Basin, Ranger Ben C. Miller found thirty-six goats feeding together as one herd.

Ranger Harkins reports a young ram drowned in Iceberg Lake. Evidently he had fallen off a cliff into the lake and had crippled himself so that he could not swim.

The albino robin, reported for the past two years at Essex (Nature Notes III, 68), returned to his haunts this past summer to nest again.

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FEMININE CURIOSITY

W.T. McLaughlin, Ranger Naturalist

Since the mule deer is comparatively seldom seen around Lake McDonald, and the white-tail is the more abundant animal, I was surprised one morning to find an old mule deer doe by my tent. Later that morning I started hiking up toward Snyder Lake, and had gotten some distance above Crystal Ford, perhaps a mile and a half, when I heard something behind me and turned to find the same deer I had seen by my tent, following along for all the world like a dog. She continued to follow for a mile and a half farther, sometimes ten feet behind, sometimes a hundred feet. If I stopped, she would stop and feed; when I started again, she was sure to be not far behind. How long this would have continued I can't say, but for an incident whic which apparently changed the doe's mind. Suddenly, in the path six feet ahead, a ruffed grouse hen appeared and, with a great deal of excited clucking, attempted to distract my attention from her chicks. I immediately headed into the underbrush where I suspected the chicks were hidden, keeping one eye on the hen to see what her tactics would be. She seemed fairly composed. Probably her chicks were elsewhere for I never saw them. I had forgotten the deer and just then chanced to see her standing in the trail curiously watching the performance. Apparently she didn't quite know what to make of it. I suspect she concluded then and there that such an extraordinary creature who would make such a fuss over a grouse was certainly not one to be followed. At any rate, she soon disappeared into the woods and I saw her no more.

LET'S GO HORSEBACK
(Part IV)

Dr. M.J. Elrod

It is impossible to recount all the interesting events with horses, but I feel disposed to relate on incident that sticks very clearly in mind. It was many years ago. Marcus Jones of Salt Lake City, Dr. J.E. Kirkwood of the university, Walter Lehman of Lewistown and some others were in the party. We had set up a tent for developing plates in the field, and, of course, had developing and fixing chemicals with us. Marcus Jones had developed about two dozen 5 x 7 plates, had poured out the old hypo fixing bath in front of his tent, and had set his plates about in the woods against trees, and on snags, logs, and stones to dry. Not a wink of sleep did he get all night. It seemed the whole band of pack and saddle horses were outside of his tent, kicking and fighting. The tent was almost wrecked. In the morning all his plates were ruined. It was tragic, but laughably ludicrous. The plates he had secured with so much labor, carrying a heavy camera and pack to the summit of the Garden Wall and for two miles along the summit, had one by one been nosed by the horses, evidently in search for the same material about which they fought all night. After that, when we wanted the horses to stay around and not leave us we dissolved some hypo-sulfite of soda in water and poured it on the ground in several places about camp. They are much more desirous of this than salt, and will paw and dig all night to get the last taste of the stuff.

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When on the trail, the horses are strung out in a line, sometimes for a long distance. Even a dozen pack horses make a good string. It is thus easy for a horse to delay the entire party by loitering or grazing. The usual method of procedure is to have a rider in front of the entire train, other horsemen distributed here and there so as to be near to the animals in the center of the line, with a rider bringing up the rear. Thus someone is ahead of the train and someone behind. In this manner it is very difficult for horses to get away or give trouble, since the trail is the only place horses can travel easily, and they will rarely leave it.

The same method is employed with a large party of tourists. Some times as many as seventy-five leave Many Glacier for Iceberg Lake, requiring eight guides. As stated in a previous article, it is the guide's business to look after the horses, and see that the dudes (tourists) do not experience trouble. Any difficulty is met by the guide nearest the person who is in trouble.

The pack horses are thus free on the trail. If a man must handle several pack horses and can not take chances on them he will lead the first horse, with the others in line, each tied to the tail of the horse in front. In this manner he is not worried by a laggard in the rear, nor can the horse in front run away or take the wrong trail. For, be it known, when a horse knows he is free on a trail he goes in a hurry.

This was clearly proven one day to a party on the trip to the north end of the park. There were about thirty pack horses. The tourists went out about an hour before the packs and stopped for lunch at Cattle Queen Creek, where the packs would pass. Fire for the coffee had just been started, when someone remarked the pack horses were coming. Silver, the head guide, remarked on the impossibility of such a thing. There had not been sufficient time. Nevertheless, there came a horse tearing down the trail, pell-mell, with a thunderous rush. He was sans pack, but the pack saddle was still on. One end of the lash rope was fastened to the saddle, to the other, some twenty or forty feet behind, were tied two dishpans, only remnants remaining.

It was an exciting moment. Eight or nine horses were tied in a row to small trees or limbs. The frightened, panicky horse rushing down the trail, vainly trying to escape from the unknown noise behind him, made one frightened rush to the group of horses, dashed in front of the row, and with his projecting pack saddle threatened to lacerate the mouths of the unsuspecting beasts by catching the bridles as he ducked under the reins. Instantly Silver was in front of the foaming, quivering horse, speaking low and gently with outstretched hands. The poor beast stopped still before harming the first tied horse.

In a few minutes it was again stated the pack train was approaching. Instead, a single pack animal, with a ridiculous load of mattresses and blankets, came trotting down the trail. Vainly had he striven to keep up with his horse companion ahead. With head and ears erect,

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searching the scenery, he finally joined the horse group, and was ready to graze. Later came the packs. The jingler rode madly down the trail trying to catch the runaway. He had stepped off the trail for but a moment, but that was sufficient time to allow the two to slip past. Frank Jessup said things when he came along at the rear of the procession. But it was all soon forgotten.

Each horse on the trail is likely to have a name to which it will respond. The names are such as may be clearly detected, as Blackie, Blue, Brown, Baldy, Smoky, Ned, Dick, etc. Ordinarily, all orders to horses are conveyed by voice or whistle. Should a horse loiter, a shriek of his name will often suffice. Sometimes a pebble will be thrown at him. When it strikes and he hears his name he knows that means business. This applies to animals heavily loaded.

When a group of horses is deadheaded, there is no loitering. The animals are free, without loads, and for both horses and men the meal and rest are at the end of the trail. Few tourists would care to keep up with the procession. Up or down the trail they go with a rush and clatter, splashing mud or throwing dust, as the case may be, all eager to reach the destination.

There is a bit of humor as well as a bit of truth in the reply of the corral boss to the woman who complained of the thickness of the horses, making riding so difficult.

"Have you no thin horses?" she inquired.

"Lady, we have thin horses only at the end of the season," he answered.

Yet it does not take one very long to understand why a horseman does not like to walk even a short distance. The first day is stiffening, the second not so bad. After that, riding for most persons is a real pleasure. And yet the horse has much to do with the pleasure, for some are as comfortable as a rocking chair, while others cause misery every time they go faster than a walk. Some are intelligent, others dumb. Some are timid and easily frightened, others push along stolidly, all senses alert, yet not easily disturbed. Some are slow and pokey, others spirited and ready to go. The wonder to me is that with so many different riders, experienced and inexperienced, so many good mounts are always available for tourists.

The end

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TILL

Peregrination of a Marten - How far does a marten travel? In August, Amos, the pet marten (See GLACIAL DRIFT V, P. 2), appeared at Pass Creek trail camp, five miles from the station. In September, he appeared ten miles away at Boundary Creek trail camp. In the meantime, he called twice at the station. His identity was established by general appearance and the unhesitating manner in which he took food from the men's hands, which is something a wild marten would never do.

- L. O. Hanson, Park Ranger

Weasel Family - A family of weasels have made their home in the woodshed. The young ones are very active, agile, and playful. They have become very tame and come within a few inches of your feet. They are about four inches long, with a pretty brown coat, white throat, black tipped tail, and sparkling black eyes. These busy little creatures have driven the mice from our doorstep and we hope they remain with us for a long time.

- H. L. Doust, Park Ranger

Pugnacious Mother - On my horseback patrol to Coal Creek the other day, and old mother ruffed grouse caused me a few very exciting moments. As I leisurely rode along, enjoying the balmy summer day and inspecting now and then the numerous flowers along the trail, a ruffed grouse appeared in the trail ahead of me. From her actions and from the noise that she was making, I knew that she had a brood of young nearby. I supposed that, as I drew nearer her young, she would try to lead me away by pretending she had a broken wing or was badly crippled, and could be easily caught. This is the usual habit of grouse, but this particular mother did nothing of the sort. She merely sat there in the trail with her feathers all ruffed up for a show down. When I got within a few feet of her, she flew right into my horse's face. Of course it startled him, and only much good luck and "pulling leather" kept me from being unseated and having a long walk back to the station.

- Ben C. Miller, Park Ranger

Transformation - About this time last year, Ranger Willey and I were fortunate enough to witness the transformation of a dragon fly from an ugly water insect to one of these beautiful creatures that are now seen flying around. We were hiking to Upper Quartz Lake snowshoe cabin. While crossing a log jam, Ranger Willey called my attention to something that was crawling up a limb protruding out of the water. As we watched it, the ugly brownish-black shell split and a beautiful bluish green dragon fly emerged. It crawled up the limb a little ways, stopped, and was perfectly still for perhaps five minutes. Then it wiggled its wings a little. Satisfied with the results, it tried them again and again until they fluttered so fast that they became only a blur. All at once, they stopped. It sat there a few moments, then spread them again and started to fly across the creek. Just as it reached the bank, a bird darted out from a young spruce and nabbed it. Short and sweet was its life, but such are the ways of nature: the strong ever prey on the weak.

- Ben C. Miller, Park Ranger

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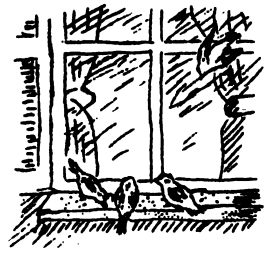

GLACIAL DRIFT

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Eivind T. Scoyen, Park Superintendent Dr. G. C. Ruhle, Editor

Perception of Nature leads to Knowledge;
Knowledge, to Understanding, Interest, Love.

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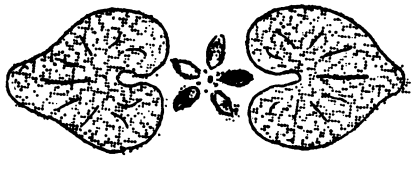

CENTENNIAL

On December 27, 1832, Thomas Wright Blakiston, celebrated bird-lover and explorer, was born in Lymington, Hampshire. As meteorologist for the John Palliser Expedition which explored Western Canada in the late fifties, he prepared and published the first map of the Northern portion of the park. A mountain and a brook in our Canadian sister, Waterton Lakes Park, commemorates his name. (See NATURE NOTES, III, 91)

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THE STONE ALPHABET TO THE ROCKIES

William G. Vinal
Western Reserve University

It is no longer true that there are seven wonders of the world. In the United States, every national park is a wonder unto itself. In Yellowstone, its geysers and boiling springs; in Mesa Verde, its cliff dwellings; in Hawaii, the volcanoes; and in Glacier, the ice fields. After the park visitor has satisfied his curiosity as to the distinctive characteristic of the particular park which he is visiting he usually turns to the geology. The pinnacles and caverns, the towering ranges and startling precipices, the remarkable colorings and the scenic interest all hark back to a rock foundation.

Thus it was at Sun Camp in Glacier National Park. Next to the story of the glaciers the pebble talk seemed most popular. It was my experience that the general visitor did not want an encyclopedic discourse. He wanted a simple key which would help him to interpret what he would see on his trips. He wanted to be able to read the historic record directly from the rocks. It was by understanding small pebbles, close at hand, that the visitor was enabled to translate the interesting story of the formation of the Rockies. The stone alphabet is so simple that an educated person, even without any previous knowledge of geology, can see and enjoy it.

Emerson once wrote that "Everything in nature is engaged in writing its own history." The history of the Rocky Mountains has been written in stone and is still being written in stone. Every process that took place in the remote past may still be seen in action. In glancing at the stone alphabet to the Rockies you must first realize that none of these rocks have always been as they are now. Each rock tells what went on in the past, is being worked on today, and will look different in the future. Each rock has a life history which is of great interest. Knowing this life history will add greatly to one's intelligence and pleasure.

The Rockies, with its four differently colored strata, the rivers and the lakes, the mountain passes and garden walls, may all be explained by these small rocks. The alpine meadows, the forests and flowers, all depend upon the underlying rocks. Each stone is a fact but by no means a dead fact. At first it may be no more intelligible than the heiroglyphics of the Egyptians, but the story gradually unfolds to those who are persistent in their efforts.

Every stone is made up of layers That simple fact is of vast significance. Water is the only agent in Glacier Park today that is sorting out mud and sand and putting them down in layers. Since all these rocks are in layers, the geologist says that they were formed in

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water. It took several generations for the scientist to realize that fossils are not chips left over from the creation. Since he now knows that fossils are the evidence of remote life and since the fossils of the Rockies are of animals that live in the ocean the interpreter says that these rocks were formed in the sea. Since this sediment was changed to rock it must have been under immense pressure. He reasons further that the lowest rock must have been put down first.* That is why the stone alphabet is arranged from the bottom up. He reckons that the thicker the layer the longer the time that it took to put it down. Today it takes about 2500 years to put down one inch on the continental shelf. Since Sun Mountain is one mile high and since its peak is about two miles above sea level, the geologist says that these rocks were laid down about 80,000,000 years ago.** All these are according to the laws of nature. The laws of nature have always been the same. Man's interpretation of these laws has changed. Again I want to say that it took man many centuries to arrive at these simple laws what may be called the key to rockscript. If you do not get the concept right away that these mountains are sedimentary rocks that came up out of the sea, do not be discouraged.

I have a friend who claims that he can find water by walking along with a forked hazel stick. He firmly believes that the stick will point to water. If you dig where he directs, you will have a well of water. My friend believes that by some force the witch hazel stick will point to water. Scientists know that underground water is present nearly everywhere, and, consequently, there will be water where the witch hazel points.

Suffice it to say that anything that man has ever discovered in the strata of the Rocky Mountains fits into the story that in the dim past this land was the sea bottom.

We will now try to interpret each member of the stone alphabet. As has already been explained we must begin with the lowest rock that the visitor will see.

1. Altyn Limestone. This is the lowest stratum exposed in Glacier National Park. It is visible at the Narrows in Saint Mary Lake and because of its hardness was not completely worn away by the glacier. The buff color of the most eastern mountains in the park are due to the weathering.

*True, naturally, only if no subsequent disturbances have taken place, the effect of which would be readily recognizable to the naked eye. The Lewis Overthrust is an example of such disturbances on a grand scale. See NATURE NOTES III, 79. - Ed.

**It is estimated that over ten thousand feet of rock overlying Glacier's formations have been removed by processes of erosion. Furthermore, millions of years have elapsed since the ocean receded from this region. Present most generally accepted age-estimate of the oldest of Glacier's rocks is 400,000,000 years. - Ed.

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of the Altyn Limestone and the whiteness of the rock used in the construction of the Transcontinental Highway near the Narrows is due to the freshly exposed surface of the limestone. This stratum is about 1,600 feet thick.

2. Green Shale with Ripple Marks. The same process that formed this bit of shale made Goat Mountain. This pebble is a big story in miniature. It must have taken an infinite amount of time to lay down 3400 feet of green shale. The wind made ripples on the shallow water which in turn made ripple marks on the clay. The record was then preserved in stone.

3. Green Shale with Sun Cracks. Mudstones are among the most abundant rocks in Glacier Park. Shale is a mud stone or hardened clay. When one finds sun cracks near the top of Goat Mountain he begins to question himself. How did these sun cracks get on the inside of a mountain? When mud flats are exposed to the sun and dried they crack. The next waters fill the cracks. These markings are the casts of the cracks. There was a time when man thought that they were turtl backs. Scientists now know that this is another evidence that the region was once a shallow mediterranean sea.

4. Red Shale with Quartzite. Above the green shale is 2,200 feet of red shale. The red color is due to a small quantity of iron. It gives the color to Red Eagle Mountain. The white layers are quartzite.

5. Quartzite This is one of the hardest and most enduring of the Glacier Park rocks. It is made up of pure silica, the same substance which composes common sand. It is often mixed with the green and the red shales.

6. Red Shale with Sun Cracks. This indicates that the sea remained shallow over a long period of time.

7. Siyeh Limestone. The deposition of 4000 feet of limestone marked the end of flood days. This gray rock makes up the hardened crests.

8. Diorite. A fiery rock liquid worked its way up from the deep interior and pushed between two layers of Siyeh Limestone. The intense heat of this intrusive mass changed the adjoining limestone to marble. That accounts for the white rock to be seen just above and just below the dike of diorite. This liquid intrustion wedged its way into the limestone for miles. Diorite is made up of hornblende and feldspar. It appears as a dark band in many of the mountains.

9. Iron Pyrites. The dark cubical crystals form a very hard mineral called pyrite. It is composed of iron and sulphur. The effects of oxidation can be easily seen in the largest crystal. Fool's gold is another name given it because of its pale brass color. Pyrite crystals are to be seen near Logan Pass.

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10. Folded Rocks. It is sometimes difficult to believe that a rock can fold and not break. These two pebbles illustrate the great process which folded the thick layers into the Rocky Mountains and made them a great playground for tourists. The folding was gradual rather than an upheaval. The layers folded like soft wax. This is the force that brought the ripple marks and the sun cracks from the ocean bottom to the mountain tops. Each fold may be several miles long. This slight yielding to internal pressure is the same sort of yielding that led to the Lewis Over-thrust. When the job was over, the western strata over-lapped the plains for ten to fifteen miles. That is the reason that the mountains present a bold steep front to the traveler from the east. While the thrust was going on there was erosion. The crest of the range has thereby migrated westward. The over-thrust may still be going on and there was probably not much more disturbance at any time than there is now. Each stone is not only an isolated fact but it is related to every other stone. The folding included all the rocks.

11. Rhombic Block. During the strain and stress of folding, the rocks were weakened along the bedding planes and at acute angles, which are known as joint planes. Consequently, the frost action tends to break the rocks into rhombo-hedral blocks. That the rocks will break this way is an advantage in building trails and roads. It is also utilized by glaciers in plucking rocks and by rivers in making valleys.

12. Dendrites. Dendrites were once thought to be fossil trees. They are now known to be a chemical "hand-writing-on-the-wall." While the mountains were slowly wearing down, the water was seeping between the layers of rock and often etched markings much after the fashion of Jack Frost.

14. Weathering. Some layers are more easily worn than others. This is another way in which the faces of the rocks are sculptured. The process is so slow that it is hardly appreciable.

15. Green Shale Pebble. Rocks broken off the cliff by the ice and other mechanical forces are always angular. Eventually they are taken up by a stream and after a long process they are rounded.

16. Red Shale Pebble. The red shale pebbles are also rounded by the river. How long would you need to roll a cubic specimen one foot on the edge to make it round and less than six inches in diameter? All pebbles in Glacier National Park are bound back to the ocean from whence they came. How long will it take them to make the journey? Each clay stone may be ground down to mud on the journey.

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17. Glacial Polish and Scratches. The hand writing of the glaciers is clearly visible in the park. Ice carrying grit in its base makes a clean sweep of the rock surface. A specimen can be polished like a mirror. The striae all run in one direction, which is down hill. The rock is as sound and fresh as though it were done yesterday, yet some geologists estimate that it may have been 20,000 years ago that all the valleys were occupied by ice streams. You will note that each member of the alphabet emphasizes that the scenery of Glacier National Park is not due to any sudden or occult catastrophe but to ordinary processes now going on much in the same way as they have at all time. Each pebble is a mile stone which measures back into a past almost inconceivably remote.

18. Fossil Algae. Beds of seaweed gathered lime out of the ancient sea and helped to build some of the limestone in Glacier National Park. This fossil alga is known as Newlandia concentrica. Six species of fossil algae have been described by Dr. Charles D. Walcott, Secretary of the Smithsonian Institution. Three new species have been recently found by Dr. and Mrs. Carroll Lane Fenton. Although the geological record of the park has been written, it has not all been read. Scientists enjoy visiting Glacier Park and are continually trying to get a complete set of the volumes that have been written.

19. Lichens. If the algae were the first plants in the sea, the lichens may be considered the first plants on earth. As a matter of fact, the lichen is a growth containing an alga and a fungus. The alga with its green material makes starch and the fungus tends to the water needs. This is a profitable association. They are able to live on naked rocks, and in the alpine country often furnish food for animals.

20. Four Lichens. There are four species of lichens on this one pebble that I have before me. Some of the grays, browns, ochres, and golds that you see on the mountains are due to this lowly form of plant life. One has to have the right gleam of light to see the golden lichens that seek the black band of diorite which is situated near the top of Little Chief and the other peaks. Can you estimate how long it took for these plants to climb to the peaks after the glacial period? Surely they did not break the speed laws.

This stone alphabet is not only presented as a means of interpreting the mountains of Glacier National Park, but as a typical means of making clear the rock story of any locality. Having worked out such an alphabet, one might easily knit together a story as read in the rocks.

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MT. GOULD

Norman Clyde

From Swiftcurrent Lake, in the vicinity of Many Glacier Hotel, one is impressed by the array of noble and beautiful mountains that sweep around in an almost unbroken circle. Prominent among these are the lofty tower-like form of Mt. Wilbur, the picturesque pyramid of Grinnell Point, a spur of Grinnell Mountain, and the broad, massive Mt. Gould rising in fine perspective near the head of Cataract Valley, on the Continental Divide. One never wearies of gazing at them as they stand in striking and majestic repose around the quiet valley with its beautiful sapphire and turquoise lakes and verdant forests. When the latter are calm, the mountain peaks are mirrored with magic beauty and softeness in their limpid depths. It would be difficult to choose between the bold form of Mt. Wilbur, towering high with a certain haughtiness, as it were, and the majestic, reposeful one of Mt. Gould. According to mood one may prefer now one, now the other.

Mt. Gould is not only beautiful to behold, but affords one of the finest views obtainable in the entire Park and has the advantage of being comparatively easy to ascend. From the Garden Wall Trail which winds horizontally along well up its western slope, it is a matter of no great difficulty for one accustomed to walking to ascend the thirty five hundred feet intervening between the trail and the summit, as a way can readily be found over the limestone ledges and argillite shelves which form its western face.

There the wonderful panorama of mountain, valley, and plain amply repays all effort expended in the ascent. Being centrally situated and having no nearby mountains to obstruct the view, the greater portion of the Park is seen in its length and breadth, with its astonishing wealth of beautiful and sublime mountains, profound cirques, hanging glaciers, verdant valleys, various-hued lakes, outspread in every direction. North and south the eye wanders along the eastern crest from one rugged peak to another, every one beautiful and striking, every one differing from its neighbor. Turning westward, it dwells upon the Livingston Range, whose mountains, altho they do not possess the marvelous variety of form of those of the other range, do possess a certain stateliness and loftiness fascinating to view.

Nearer at hand the view down the Swiftcurrent Valley has some resemblance to that obtained from Half Dome into the Yosemite. In either case, one looks downward from a great precipice, approaching a mile in height. In the former, however, one gazes at the level, pine-clad floor of a gorge enclosed by sheer walls of gray granite; in the latter, one looks down over a crumbling precipice of somber-hued limestone and dark argillite at the valley clothed with spruce forest, interspersed with several lakes ranging in color from light turquoise to deep blue. In the one with all its massiveness and sublimity there is a certain atmos-

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phere of lightness and joyousness; in the other, with all its grandeur and repose there is a certain air of melancholy. In the first there is the brightness and joyousness of the south; in the second the soft-toned pensiveness of the north.

One can easily clamber for some distance in either direction along the ridge and survey carefully the Garden Wall with its array of precipitous pinnacles and its cliff wall which drops almost sheer for a great distance to the crevassed glacier clinging to its lower slopes far below. When satisfied with the view secured one can return by the route followed in the ascent or vary it somewhat by going down a different portion of the same face of the mountain. Superb views of the mountains about Logan Pass and those across the Valley of McDonald Creek, especially of the stately Heavens Peak, regale one whenever a pause is made in the descent, and perhaps numbers of the bighorn sheep that are abundant on the slopes of that side of the mountain may be encountered on the ledges or the pastures below them.

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TILL

Spinach - For the fourth time this season, bears have wrecked Arrow Lake Snowshoe Cabin, in spite of added precautions taken to prevent this. Much canned goods had been left by a two-man trail crew; all was opened and consumed, except the cans of spinach. These were opened and left untouched. You can't fool a bear with that!
- Ray E. Newbury, Park Ranger

Lassoed - On December 29, a large buck appeared in Logging feed yard with a mass of baling wire tangled on his antlers. This was dangerous as there was ample opportunity for him to become ensnared in brush and starve to death. I fetched my lariat and tossed a loop over his antlers, baling wire and all. Things happened right there. A most meek and docile appearing animal became a demon of frenzy and fear. He bolted to the end of the rope, and my head snapped on the neck joint at this sudden crack-the-whip maneuver. He snaked me about as he fought the rope until at last I managed to get a dally around a passing fir tree. Bit by bit I took up slack until his antlers were securely snubbed against the tree. I cut away all the wire and then the rope. He fell over backward, got up running, and has not been seen since. I should hate to rope a moose. - Hugh Peyton, Park Ranger

Adoption. Near the mouth of Ole Creek, there lives a mule deer doe that has adopted a whitetail fawn. In addition she has two of her own. The first time I saw the four together, I looked for a whitetail doe, but did not find her. Meanwhile the four stood watching. The mule deer fawns started up the nearby hill; their mother started after, but stopped to wait until the young whitetail got ahead of her.
- Ben C. Miller, Park Ranger

Third Antler - In November, there appeared near Belly River Station a buck mule deer which had a third antler. This was attached just above the normal right antler. It curved down the right cheek so that the points reached beneath the throat. - Elmer N. Ness, Park Ranger

One hundred three mountain sheep appeared at Many Glacier on Christmas day for their holiday dinner. For lack of something special, they were given an extra bale of hay.

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Tournament - The mating season of deer was still in full swing at the close of November. Two fatalities were known to have resulted from the annual jousting between whitetail bucks. Ranger Buchanan at Polebridge found two bucks with antlers interlocked. One buck was dead from a broken neck and much frantic exertion was needed to free the living animal from its late adversary. Foreman-electrician Modisett reported the other, a dead battler on the North Fork Road with both eyes gouged out by the tines of an enemy. - Chas. L. Croghan, Asst. Chief Ranger

Mink and Hawk - On patrol up Midvale Creek in December, I came upon the track of a mink following up the creek on the snow and ice. He would plunge into every spot of open water, apparently for fish. At two holes, blood stains indicated his success at getting dinner. Upon rounding a bend in the creek, I discovered a big hawk perched on a windfall across the stream. His eyes were glued on one of the holes used by the mink in fishing. I approached to within ten feet before he became aware of my presence and flew away. Whether it was his intention to make a meal of the animal or to rob him of his catch, I can not say. In either case, he should have had a long wait ahead, for I overtook the mink three hundred yards further up the creek.

- Thos. E. Whitcraft, Asst. Chief Ranger

Enter the Villian - During December, Two Medicine Station was visited by many creatures. Jays squawked rauscously around the door. Grouse paraded stylishly about the yard. Rabbits hopped all over the back porch. A weasel and a squirrel lived together in the woodshed (See GLACIAL DRIFT V, 20). On the twelfth, a marten made his appearance, killed and ate the squirrel, and evidently drove off the weasel. He lifted the drop door on the meat box and imprisoned himself until liberated. Later food was put in for him, and he now knows how to lift the door at will. Whenever the marten leaves for several days, the weasel returns, but their tracks have never been seen together.

- Clyde C. Fauley, Park Ranger

Amos 'n' Annie, Again - Amos 'n' Annie have returned to Waterton Station this winter. They burrowed under the station wall into the cellar to steal all of my eggs and part of a box of apples. The eggs were removed without leaving a trace. - L. O. Hanson, Park Ranger

Prosperity - Several years ago, the importance of an abundance of rabbits to the welfare of the wilds was expounded (See NATURE NOTES III, 88). Such an abundance graces the Park now, in strong contrast to the dearth of five years ago. Numbers of smaller animals that hunt and are hunted have thrived proportionately. Tom Whitcraft bore testimony on his December report thus: "There are hundreds of rabbits on the east side this year.....on several occasions I have nearly stepped on one that was nearly buried in loose snow, for a rabbit would sink almost out of sight with each jump. The same is true of grouse, which are extremely numerous. Several of them have exploded from right under my snowshoes. ....The east side is showing a rapid increase in marten population. ....Weasel signs are plentiful in all districts. There are

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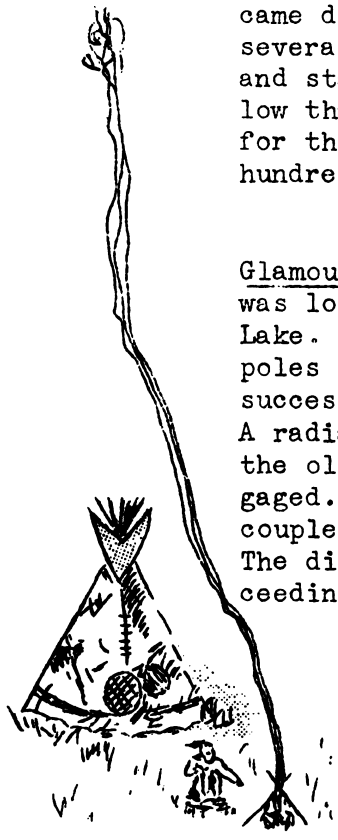
great numbers of pine squirrels in evidence." Mr. Fauley reports: "Rabbits fairly swarm. Marten are plentiful, altho five years ago my diary remarks that they were uncommon. Coyotes are attracted to the green timber by the abundance of rabbits. Mink signs are numerous." Other reports read similarly, and the frequency of mention of lynxes, foxes, skunks, hawks, owls, and their ilk, indicate that for these, at least, prosperity is not "just around the corner," -- it has already arrived.

Plans Awry - Much has been said of an uncanny engineering skill shown by beavers; but their plans, too, may go awry. On the North Fork, they felled a thirty inch cottonwood, which dropped the wrong direction and lodged securely in a forked spruce. - Channing T. Howell, Park Ranger

Befogged Ducks - More geese on their southward flight came thru in November than in October. A large flock numbering about seventy birds came during the big storm on the thirteenth and stayed several days. Each day they would rise from the lake and start for Koctenai Pass, but the clouds were so low that they could not find it; so they would return for the night and try again the next day. About one hundred ducks of many kinds accompanied the geese.

- L. O. Hanson, Park Ranger



Glamour of the Past - During October, an Indian camp was located above the outlet of Lower Two Medicine Lake. A squaw tended a small fire beneath a tripod of poles strung with long strips of meat from an elk, successfully stalked by her husband on the slope above. A radiance about her indicated how dear to the heart of the older Blackfeet was the task at which she was engaged. Here was glamour of the old days for this elderly couple which brightened their present drab existence. The dignified old man told me that last winter was exceedingly pleasant for his people, thanks to the Yellowstone buffalo meat given them by the Park Service. "It was fine meat, covered with yellow fat, because it was so rich," he said.

- Clyde C. Fauley, Park Ranger

The last bear of 1932 reported was at Belly River on December 9. The last one on the west side was at Lake McDonald, November 25.

Signs of mountain sheep on and near Chief Mountain indicate that they are again inhabiting this region. - Thos. E. Whitcraft

Ranger Newbury reported that on December 2 a mule deer buck had butted another buck and a doe off the highway into McDonald Creek above the trail-crossing viaduct. These were dashed over the series of waterfalls and drowned.

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Algae For Beaver Houses - During a trip around Avalanche Lake last summer I picked up some tan, hair-like material from the surface of one of the beaver houses. From its odor and appearance I surmised it to be of animal origin, but sent it to the Wildlife Division for identification. There the material was identified as algae of the genus Rhizoclonium. Quoting Joseph S. Dixon, of that Division: "This identification coincides with my own observations and experience, since on numerous occasions I have found that such algae grows profusely on the bottoms of ponds, lakes, and irrigation ditches, especially in the late summer. On many instances I have found such material on beaver houses. Presumably it had been carried here along with the mud which the beaver used to plaster the house. I have never found any animal remains in the material that the beavers used to mud their houses."
- M. N. D'Evelyn, Ranger Naturalist

Audacious Marten - A marten of most audacious temperament inhabits the woods about Sun Camp. I first saw him one July morning as he crossed the trail near Baring Falls. Next he appeared on the porch at Sun Chalet, again in broad daylight. Never did the little chipmunks and mantled ground squirrels take to their burrows in greater haste! Later he ran thru the chalet lobby in pursuit of a ground squirrel. The best view of him was obtained near Sun Camp Ranger Station in August, as he walked leisurely down a sequestered trail, passing just a few feet from the naturalist's tent. Where he lives I do not know; but if he cares as little about showing his home as about showing himself, it will not be long before we find out.
- John S. Garth, Ranger Naturalist

Marauding Mink - The trail crew at the head of Red Eagle foiled a visiting mink's plans for breakfast of bacon and eggs. The mink had been noticed making trips in and out of their egg crate but no one paid any attention until it made a great fuss on one of its outbound trips. On investigating they found that the reason the mink did not slip under the tent with its usual agility and lightning speed was because in its mouth it had part of a slab of bacon which caught on the lower edge of the canvas. They retrieved the bacon all right, but soon learned that their egg supply was short by two dozen.
- Elmer Ness, Park Ranger

Ground Squirrel Hunt - One day I watched a weasel go down one ground squirrel's hole after another on Logan Pass. He did not stay in any burrow for any length of time and never seemed to find his prey, but there was not a ground squirrel in sight for a long while afterwards. The weasel allowed me to come within ten feet and I admired his sleek beauty, tho his appearance was that of the cruel, bloodthirsty little devil that he really is.
- B. A. Thaxter, Ranger Naturalist

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PLACE NAMES
of Glacier National Park and Vicinity

(No. 48-54) *Mr. R. H. Sargent mapped the regions of Glacier National Park in the northeast corner, around Lake McDonald, and around Bowman Lake. So far as is authoritatively known, he and Major Ahern are the only two people ever successfully to have led a pack train over the treacherous Ahern Pass between the South Fork of Belly River and Mineral Creek.

Being an admirer of the great poet, he named LONGFELLOW Peak. Lake Evangeline followed, naturally, and still later Evangeline Creek, tho these names were not given by him. His admiration for color furnished him with the name for RAINBOW Glacier and Peak.** The name GOATHAUNT had been suggested by Bailey Willis, who led the celebrated geological expedition thru the region in 1902. Dr. Willis first recognized and named the most celebrated geologic feature in the Park, the Lewis Overthrust.

Several features named by Mr. Sargent were for members of his party or for local people. GLENNS Lake was named for T.C. Glenns, born on the Crow Indian reservation, who was with Mr. Sargent as station assistant and recorder for several years. James Kipp had his cabin near Mount KIPP. VALENTINE Creek was named for Frank Valentine, a youthful packer from Columbia Falls. For his cook, Charlie Olson, friend of Frank Valentine, was named OLSON Creek. Later, someone named OLSON PEAK after the creek.

Mr. Sargent utilized all existent names which he found on a small map of the region published by the Forest Service, Glacier Park being part of Blackfeet National Forest prior to 1910.

A L. McDonald
B Longfellow Pk.
C L. Evangeline
D Ahern Pass
E Mt. Kipp
F Belly R.
G Glenns L.
H Goathaunt Mt.
I Valentine Creek
J Olson Mt. and Creek
K Waterton Lake
L Rainbow Peak and Glacier

**It is said that Frank Liebig, former Glacier Park ranger and now with Blackfeet National Forest was with Mr. Sargent on a trip on which the glacier was viewed glowing with iridescent colors in the light. "Just look, the glacier shines with all the colors of the rainbow!" remarked Liebig. The simile gave rise to the name.

*From a conversation of R. H. Sargent of the U.S. Geological Survey with the Park Naturalist.

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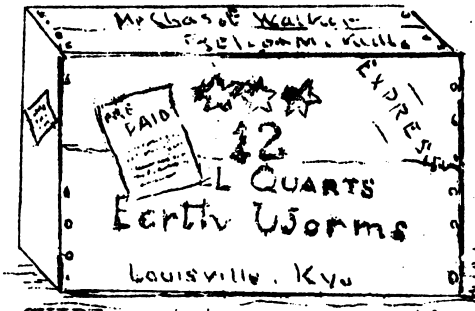
ROD -- A sporty name for a "fish-pole" costing over $5.00. Rods are sold by weight, the lighter the rod, the heavier the price. Like knights of old who splintered their lances in tournaments, all fishermen strive to have a fish break their rod--an event of great distinction to boast about.

REEL -- A coffee-mill invented by Satan, and designed to come loose, get out of order, or snarl up at critical times, thereby inducing lurid and profuse profanity.

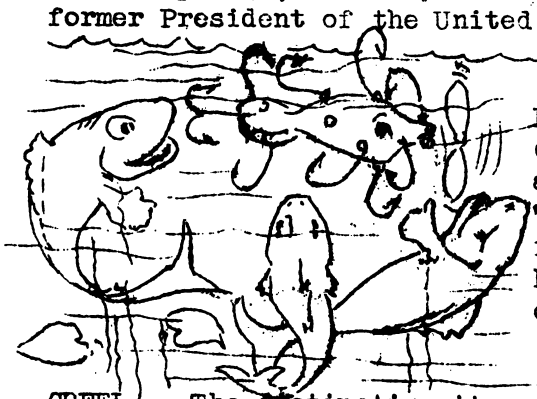
FISH-LINE -- An expensive piece of string used on a reel. It snarls, gets snagged, and is guaranteed to break at the right time, thereby creating the necessary alibi for the "whopper" that always gets away.



BAIT -- A secret word of the fishing fraternity for an illegal but highly exhilarating beverage, which is carried "on the hip". It will remove varnish, and counteract heat, cold, snakebite, bad luck, "that tired feeling", or "what-have-you".

GUIDE -- A true conservationist in disguise. His duty is to take you fishing "where they ain't", and to encourage you to come again "next week", when the water is lower, or higher, or clearer, or wetter.

WORMS -- Greatly scorned in writings and in public, but used widely and secretly by most trout fishermen. A few, hardened anglers, unmindful of public opinion, brazenly admit their use. Outstanding among them was a former President of the United States.



PLUGS -- Imitations of bananas, dill-pickles, darning needles, bugs, birds, bees, and animals. Now manufactured in many alleged "lifelike" shapes, and primarily designed to fool the fisherman and lure a dollar bill from his pocket. However, authentic records exist of many feebleminded fish taken on these lures.

CREEL -- The distinctive item of a trout-fisherman's uniform. A fragile wicker basket in which to hide a worm can, carry a fly book, lunch, slicker, etc. Occasionally used to hold small trout.

"THE CHRONIC FISHERMAN"

Plot on Thursday,
Organize on Friday,
Start on Saturday,
Fish on Sunday.
"Never Again" on Monday,
Still tired on Tuesday,
All set for more again on Wednesday.

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ANGLER'S DICTIONARY

This dictionary was compiled by some unknown fish-fan and was distributed on mimeographed sheets at a Sportsman's Show at Los Angeles last winter. Further details about its origin are unknown to the editor.

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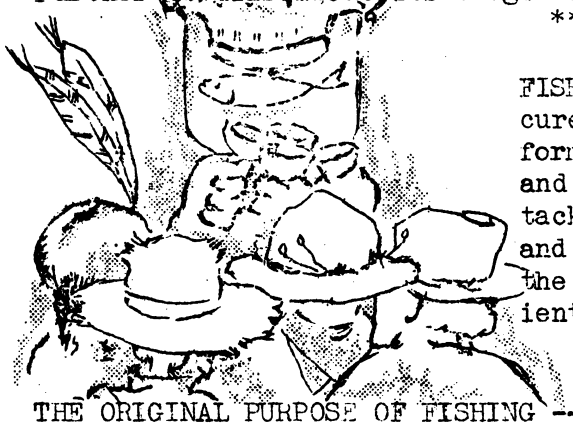

FISHING -- A disease for which there is no cure; "catching but not contagious". It formerly infected only savages, small boys, and village ne'er-do-wells; but it now attacks presidents, judges, ministers, doctors, and ten million others. In extreme cases, the fever can be reduced by placing the patient in the hot sun for several hours.

THE ORIGINAL PURPOSE OF FISHING -- Of inflicting pain upon the worm, the minnow, the frog, and the fish, has been reversed. It is now an endurance test of the fisherman--trials by sunburn and moon shine--mosquitoes--poison ivy--lack-of-sleep--camp-cooking and excessive confidence in "wild-deuces".

FISHING CAMP -- A place to wear out old clothes; play "old maid"; eat half cooked food; fight insects, and act red-blooded. Liveliest hours are from midnight to daylight. Happy camping parties have been spoiled by erratic individuals who insisted on "going fishing". A favorite camp motto is "Fish and Visitors smell after two days."

BOOTS OR WADERS -- An effective means of carrying a large quantity of water from the stream to a convenient log. Guaranteed to keep the feet hot in summer and freezing in cold weather. "Waders" hold more water than "Boots", and therefore are preferred in putting out camp fires.

FLIES -- A feather imitation of nothing-ever-before-seen, with very fanciful names, and the favorite food of house moths. Flies are principally used to decorate fishermen's hats, although some are kept in a fly book. Made in two kinds, "Anti-Volstead" and "Prohibitionist". Wet flies are gaining in popularity, are now favorites along the Canadian Border, and in Wisconsin, and some other states.

BOAT -- A leaky, ill-smelling tub, provided with two tomato cans for bailing, and a pair of mismated oars with one oarlock. Usually rents for $2.00 per day. Antique boats command a great premium.

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Five miles up the valley we came to the lower falls, and under the protection of the steep bank and just beyond the spray of the falls we pitched camp for the night. This apparently was as far as the stray fishermen ventured into the valley, for little trace of human visitation was found beyond. The following morning we took the trail on foot, to explore the upper reaches of the valley. In this case "explore" is an apt word: there was no trail with the exception of the first mile; the dense forest made any progress difficult, and it was obvious that few had ever trekked it.

At the very head of the valley, some four miles from our camping spot we saw below us bell-shaped Miche-Wabun Lake, named in memory of the Cree Indians that sometimes wandered into the northern sections of the Park. Its color was a deep blue, and reflected the white of the Miche-Wabun Glacier which snuggled under the cliff at its head. No mountain highway, not even a trail skirted the shore of this lake. No boat docks, no trout fishermen broke its even surface. Mount Cleveland swept upward sheer from the talus slopes on its southern shore.

Everywhere on those bleak appearing slopes fruited the curious bladder pods with two bladder like cells puffed side by side on the end of each stem. More protected slopes were covered with stunted shrubby cottonwoods, here growing at an elevation of over six thousand feet. Here too were thousands of tiny raspberry bushes, each covered with delicious, rosy-red fruit.

For him who is unafraid to venture into remote regions, there still is wilderness in ample measure in Glacier National Park.

Ropers - Glacier Park was cursed with amateur lariat whirlers this summer. Early in August some sinner roped a little black bear cub, one of the twins of a brown mother bear that has been near the Switchback on Going-to-the-Sun Highway all season. Perhaps the mother charged and the fellow had to drop the rope, but not before it had tightened enuf to strangle the cub to death. The grief of the mother was pathetic, according to a bus-driver who passed by later. She would nuzzle the little one repeatedly, seeming not to understand why it would not respond. Finally she picked it up in her mouth and carried it down into the woods. A similar incident occurred a week or so later on Logan Pass. I found a Columbian ground squirrel with a fish line around its body just behind its shoulders. Somebody must have attempted to catch ground squirrels by laying a noose around their holes. This one had gotten away, but had snarled in an alpine fir. Thus I found it. I held it by the back of the neck, cut the string, and away it went--a good deal happier than the little cub. Why must people annoy little animals in that way?

- B. A. Thaxter, Ranger Naturalist

All sketches in this present issue are by Merritt Johnson of the Fire Protection Organization.

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"Come!" said the Counselor, "Let us sit in this poplar grove and rest. That silver that you noticed gives this tree the name of silver-leaved poplar." The Camper marveled at the flattened leaf-stem which was the cause of the leaf-dance. He had heard of the trembling aspen but did not know that aspen and poplar were different names for the same group of trees. And he had read in western story books about the Indians camping in a thicket of cotton wood along the streams. "This down", continued the Counselor, "prevents the loss of moisture. No, that is not the reason that it is called cottonwood. It has cottony fruit which is much like the milkweed except that it is on a smaller scale. The aspen, poplar, or cottonwood is great beaver food," volunteered the Counselor, whereupon another volley of questions were shot forth by the camper. At the end of fifteen minutes one could have heard the Counselor say, "We will have to save my other beaver stories until a later time."

As they stood to go the Counselor said: "My grandmother called this tree the necklace poplar. If you have fair eyesight you can find one of these necklaces." Whereupon, the Camper scurried about and soon presented a fuzzy catkin. He shook the catkin and caused a miniature "snow-flurry." "How would you like to play detective?" queried the Counselor. This led to an animated discussion on prevailing wind, cottonwoods along streams, and how the silver-leaved poplar had been introduced from Europe by homesteaders.

They left the cement road and searched across the fields for the ancestors of the silver-leaved poplar. New questions were brought to the feet of the Counselor. Seeing cottonwood groves, smelling the balsam poplar, listening to the rustle of the leaves, hearing the story of the farmer as to how his "grandpap drove the cows home and stuck the gad in the ground which was the beginning of this old asp tree" were woven into a pattern of everlasting experiences.

Now this Camper became a man and whenever he had a vacation he spent happy days in the woods and taught others that trees are interesting and beautiful. He would gaze at vistas along the roadway and often left the cement pavement to investigate a clump of trees. He bordered the windows of his home with silver-poplars that brought pleasant memories. And he served his fellowmen unselfishly thruout all his days.

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WILD FLOWER STUDY IN GLACIER NATIONAL PARK*
Introduction

William Gould Vinal

What things in wild flower study are of most worth? Does the human race find more value in mounted specimens or in the simplicity and grandeur of the wood rose on its stalk? It is estimated that there are nearly 125,000 kinds of flowering plants. If the main objective is to name each kind, even those to be found in one locality, it would be an impossibility. Then again, if a school rewards its pupils for learning fifty flowers, perhaps pressing and mounting them, to discover later that society is trying to conserve our native wild flowers the change may be too great for normal behavior. The work of school should relate to life activities, and the mastery of a subject should be in terms of human relations.

In a contemplated visit with one's students to Glacier Park, let not the science teacher complain that he does not know the names of the alpine flowers. Let him learn together with his class. Ignorance is not the greatest evil. And the observing teacher will learn much of method from the ranger naturalists. They also are school men for the most part and have become especially skilled in the ways of making the plants of the outdoors interesting and understandable. They can translate the timber line, the alpine meadow, and forest swale into intelligible and appreciable items. The ranger naturalist has analyzed the interests of laymen. High school students are not being trained to become botanists but to take their position alongside the non-professional.

On this basis we might divide wild flower study into academic botany and practical botany. The high school student is not serving apprenticeship to a job but to life. There are qualities of personality that cannot be developed in a laboratory. He must keep the ethical standards of the field. He must get back to the beginning of things. He must see living plants in relation to soils and climate and have a good time doing it. He must get an appetite for life. Too many teachers would have their students go to the laboratory to read what Emerson, and Lowell, and Agassiz said about getting out into the world.

Our best literature does not refer to the dissecting needle and razor blade but to nature. While the student sits at the table studying the difference between the monocotyledons and the dicotyledons, the saunterer is hiking the trail with elasticity of step and a glow in his face. There is no reason why one cannot have pure air, pure water, forests, and flower study at the same time. The closet naturalist does not realize the meaning of "do not pick the wild flowers" as he has no basis of knowledge to tell him how people feel about it. Destruction by forest fire does not strike home until he has seen one or tramped among the charred remains. He has no realization of the pleasure that awaits him from a trip above timber line. Let him get the "feel" of

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Glacier National Park, and when he picks up a chewing gum wrapper to make an alpine flower garden more beautiful.

Civic pride is a possession of every old timer in Glacier National Park. The spirit is contagious and soon a part of the being of every newcomer. It keeps the film pack tabs in your pocket, paper bags and picnic rubbish in receptacles; it prevents the carving of trees; bill boards are unknown; forest fires are criminal; and wild flowers remain in their native haunts. Whether this will carry over to the home community or not I am unable to say, but I do know that public sentiment is better than laws in obtaining outdoor good manners.

Last but not least, flower study must have pleasant associations. Anyone who has ever ridden thru acres of bear grass will always have a feeling of delight when seeing a field of this cottony flower. The yellow mimulus near the cool melting glacier, the Richardson tree squirrel gathering cones from the Douglas fir, the fringed parnassia on the edge of an unknown rock cliff, the scent of aspen wood smoke, the odor of the honeysuckle, the feel of cold air on the face when you left the heather to struggle over crag and rock, the mountain goats getting a living off the sparse plant life on a rocky ledge possess beauty, mysteriousness, dangerousness, and rarity. They are not isolated specimens but arouse the passion for discovery, unexpectedness, and the recreational diversion that can only come thru a flower trip to the land of eternal snow. What high school boy or girl would not list these as opportunities rather than requirements?

There are those who may still wish to figure the value in hours and dollars. If the class stays a week and works and thinks nature study for ten hours a day it will amount to seventy hours which will be equivalent to a two hour course for a year. In the senior high schools of Cleveland, the cost of instruction per pupil was $170 per annum in 1930. It is possibly $150 today, which would make five courses cost $30.00 apiece. From this data one may do all kinds of figuring about the cost of a week's trip in Glacier. This is the way we would reckon the cost of beans, cigarettes, or a movie. This, however, would not be the value.

*Editor's Note: Each year science teachers from high schools and universities bring classes to Glacier National Park for field study and observation. In this series of three articles, Dr. Vinal gives advice to high school teachers, but which is timeworthy for all nature students, young and old. Dr. Vinal ("Cap'n Bill"), ranger naturalist at Sun Camp in 1931, is head of the nature-study division of the School of Education, Western Reserve University, at Cleveland, Ohio.

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BEAVER RATIONS AND TAILS

C. G. Harkins, Park Ranger

Beavers are expert woodcutters and builders, and, while not endowed with the degree of human intelligence often ascribed to them, they are quick to learn and take advantage of the creations of man. Last summer a pair could be seen every evening storing food for winter under an old dock on Swiftcurrent Lake. At times, what appeared to be a huge brush pile would be seen moving upon the water. On reaching the dock, it would suddenly duck; a great commotion would ensue under the floor as it was being stored away.

A number of tourists asked me, "Why is a beaver's tail flat and wide?" To answer, it is only necessary to see it in use. In the water, it serves variously as rudder, propeller, and signal gun. Its full width and steering power are taxed to the limit as the beaver swims by the side of a pole or log towed to its house, dam, or food cache. Only the tail thrown out sideways prevents traveling in circles. As a signal gun the tail is squarely whacked on the surface of the water, thus warning all their kind of the approach of an enemy.

TILL

Elk Cow - A two-year old elk cow lay on the ice of St. Mary Lake near the Narrows, having evidently fallen on the smooth ice and injured her hip or back. Tho she appeared very poor, I thot it would be worthwhile to move her to the station where I could feed her; I went for help and a team and sled. At the station, she drank water and ate hay, and seemed to be convalescing splendidly, when one afternoon she suddenly died. I was sorry for this, as she was heavy with calf and I should like to have known whether she would be tame if she had recovered.

- Art R. Best, Park Ranger

There are 26,242 acres of lakes in Glacier covering 2.67% of the total park area; 178,432 acres or 18.17% is barren rock.

- G. N. Paige, Fire Chief

The first bear sign of the year: March 30, on the North Fork District, reported by Ranger Channing T. Howell.

The name "cedar" is popularly associated with trees possessing wood of exceptional durability. True cedars are native to the Old World only.

The botanic name "Thuja" for the Western Red Cedar tree is derived from the Greek meaning "sacrifice." A resin procured from this genus was used as incense.

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Age Challenges Youth - On returning from Upper Park Creek on February 14, I came across an old mountain goat fast asleep on a log at the uppermost crossing. I holloed to awaken him; he looked up, batted his eyes a few times, stood up, and stared. I tried to scare him, but goats are not easily frightened. At last he climbed off his log, jumped the creek channel, stomped on the ice as if in challenge -- dauntless in spite of his great age and haggard appearance. He must have come down from the cliffs to spend his few remaining days. - Ben C. Miller, Park Ranger

Thunder Bird Island - In Lower St. Mary Lake there is an attractive little island known to the Indians as "Thunder Bird Island." The Indians believe that thunder is made by a large partridge-like bird flapping its wings. A party once found it on the island and took it home with them to their tipis. They showed it to the medicine man, who claimed it was a medicine bird. As long as it stayed inside, the bird kept its eyes shut, but one day they were opened and streaks of lightning came out. The bird spread its wings and flew away, its wings beating out thunder. Whenever the Indian sees lightning and hears thunder he says that the thunder bird is flying. (Told by H. A. Noble, former manager of the Glacier Park Hotel Company)

Two Medicine in Winter - Two Medicine Chalets in February presents sublime winter desolation. Several of the cabin lodges have only the roof ridges visible above the snow. Huge drifts surround the grounds, and the roofs are swept bare of snow most of the time. A porcupine makes his rounds of the buildings and walks under the eaves. A coyote makes his nightly stalk across the yard in front of the main lodge and is literally king of all he surveys. Winds of terrific velocity sweep down the lake and strike the chalets, giving forth drab wailings of loneliness. - Clyde C. Fauley, Park Ranger

Trick Falls in Winter - In January, Trick Falls presents a very different picture from that familiar to summer visitors. The water is imprisoned behind an armor coat of ice, from which it breaks forth at the bottom of the fall. A sombre quietness pervades which to some would be drab loneliness; to others, a rare delight. On a waning January afternoon, dark shadows steal across the gorge; while in the background, Rising Wolf looms up, flooded with sunshine. Fir, spruce, and lodgepole are weighted with snow. Below the falls, the blue-green Two Medicine sings among the pines and plays hide and seek with the snowbanks in best approved fashion. - Clyde C. Fauley, Park Ranger

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SEP 30 1935

GLACIAL DRIFT

OCTOBER 1935

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GLACIAL DRIFT

NOTES FROM GLACIER NATIONAL PARK

JUNE 1933

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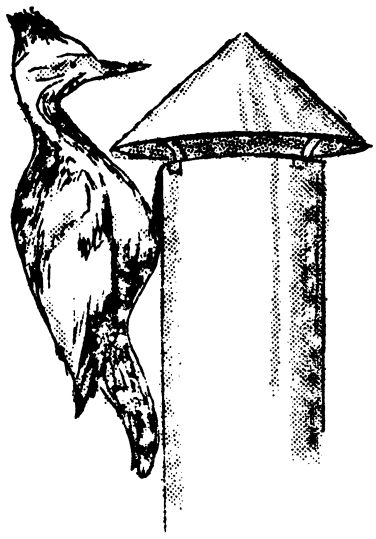
Pet Owl - A great horned owl, believed to have been brought from Idaho when C.C.C. Camp 1 came to the Park in the spring of 1934, has made the Belton mess hall its headquarters during the present spring and summer. At the whistle of cook Glenn Montgomery, the owl will swoop out of the trees nearby to be fed raw beef by hand. During daylight hours it will cock its head quizzically but is apparently unable to distinguish objects more than a foot or two ahead of it. One afternoon the owl permitted Montgomery to bring it out of the dark woods into the open sunlight to pose agreeably for a photo. It has become so accustomed to man and its adopted surroundings that it remains perched on the gong outside the messhall door while the flunky rings the first call in the morning. Despite its hand fed diet of beef, the owl has not given up its natural food of small mammals, and the gopher population around headquarters is diminishing as a result.

Nesting Pipit - On July 14 I found a pipit's nest under a clump of white dryads on a rock slide above Preston Park. The five eggs which it contained were not deserted by the female, until I had nearly stepped on her. Glacier Park, with the highest portions of the Rockies and the Arctic regions, is in the nesting range of the American pipit. It winters in California, Nevada, Gulf States, and south thru Central America.

- James L. Dyson, Ranger Naturalist



Broadcasting Woodpecker - At the head of Lake McDonald we have a woodpecker who has done his contemporaries one better in advertising his presence during the mating season. Usually a dead snag or telephone pole serves as a sounding board for the hammering bill of the male, but this particular individual makes use of an iron chimney cap and thereby broadcasts over a much larger area. Each morning at daybreak he is on the air with a rat-tat-tat which sounds not unlike Morse Code. Tho I have not yet been able to understand his language and while I am hardly elated at having such a noisy neighbor, I do greatly admire his power and technique. "By gar she got hard nose".

- Ray Newberry, Park Ranger

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Cracker Lake Marmots - Two marmots at Cracker Lake seemed to ignore the usually accepted idea that animals will fight, if necessary, to gain sole possession of food. Two of the latter had darted for a slice of buttered bread that lunching hikers had thrown to them, and had reached it at the same time. To the surprise of the onlookers, no fight took place. The marmots immediately began to eat, working slowly towards each other from opposite sides. The hikers complimented the animals on their fine sharing spirit, but too soon! for when just one thin strip of bread intervened between their jaws, the fight began. - James L. Dyson, Ranger Naturalist

Patient Grouse - A Richardson's grouse has made her nest under a small log twenty feet from the station barn. She has posed for her picture several times, besides receiving the daily attentions of the CCC boys of the spike camp, who pass within six feet of her when going to and from work. Her worst threats are a crow that uses a tree nearby as a perch and a sparrow hawk that sits on the ridge of the barn almost directly over her. So far she has successfully concealed her presence from them. She hatched five chicks from six eggs on June 29. - Hilbert Krause, Park Ranger

Bark Beetle Flight - The evening of June 10, 1935, I noticed hundreds of small insects flying thru the air near the woodshed at the rear of my residence at headquarters. Specimens examined were identified as Douglas Fir Beetles (Dendroctonus psuedotsugae). So far I have been unable to locate any trees near the scene which show evidence of an attack. Two years ago I observed a similar flight in the same place, and no Douglas Fir near the house suffered any damage.

- E. T. Scoyen, Park Superintendent

Sprague Creek Flight - On the evenings of June 21 and 22 the Douglas Fir Beetles swarmed into the Sprague Creek camp and attacked 14 trees, just about all the remaining Douglas Firs in that area. A snap decision would indicate that they were in for a heavy infestation of beetles this season. However, the winter of 1933-34 provided an immense number of windfalls as ideal host material for both fir and pine beetles, and observations indicated that these conditions were fully utilized.

- Charles L. Croghan, Assistant Chief Ranger

Cascading Moraine - Sexton Glacier, nestled on a shelf high up on the north face of Going-to-the-Sun Mountain, is an excellent example of a cliff or cornice glacier; it is hemmed in by a towering rock wall in the rear, and the front of the ice rests along the edge of a cliff rising high above the head of Baring Creek. At several places the ice is so close to the edge of this wall that there is no room for morainal material to accumulate, so it is spilled over the edge to form a huge talus cone in the valley below. Such a feature might aptly be termed a "cascading terminal moraine". - James L. Dyson, Ranger Naturalist

Melting snows revealed an unusual accident this spring, as I found a dead mink in the tunnel of a pocket gopher. The mink had evidently burrowed after the gopher, had found that the frozen ground made further advance impossible and then that retreat was also impossible. The evidence indicated a terrific struggle. - Clyde Fauley, Park Ranger

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WOLVERINE RECORDED IN TWO MEDICINE DISTRICT

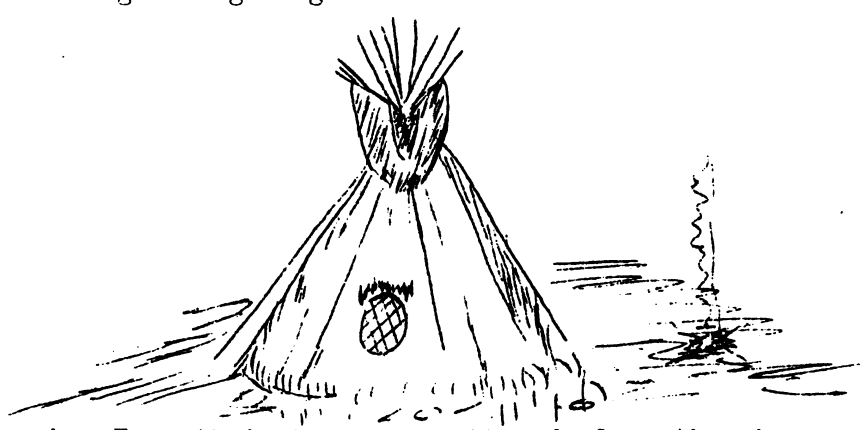
Joe. C. Walters, Engineer

For the first time within a decade, a wolverine has been recorded within the park. Ranger Clyde C. Fauley of the Two Medicine District reported that he observed signs of this peculiar animal in the vicinity of Trick Falls in the early part of April.

"With an awkward, shuffling gait, somewhat like a porcupine, the big tracks puzzled me, until I came to a deep hole in the snow which the animal had dug. Here a very distinct wolverine odor greeted me, and I was positive of the identity of the departed traveler."

Naturalists speak of this animal as one of the most remarkable of the hundreds of four-footed creatures in North America. The wolverine is a sturdy, able-bodied animal about the size of a bull dog, has a ravenous appetite, fierce temper, and great cunning. With mechanical assiduity, it will rob a trapper's line of bait and catch, all the while avoiding traps set for it with uncanny precision. It is the greatest thief in the animal kingdom and will fight any animal its own size or many times larger.

Before Glacier Park was created in 1910, a number of these animals were caught, but until this lone wanderer appeared, it was seldom that signs were seen in this part of the country. The wolverine is a great wanderer, and in this forested region one is likely to appear at any time from some neighboring range.



Indian Landmark - From their teepees scattered along the shores of Two Medicine Lake, Blackfeet Indians looked up to a smooth, rectangular slab of rock on Two Medicine Ridge which in its frame of erect mountain pines glistened in the sun like a mirror. With characteristic aptness, they named the boulder "Looking Glass." After the relocation of the Blackfeet Highway, the Blackfeet returned to their traditional campsite but missed the shining landmark on the distant slope. It had been blasted away in making the present roadbed.

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the tender soil fungi that spread thru the thin soil and feed the tree rootlets; the rest have succumbed before the onslaught of fierce winds, as protective barriers have been destroyed so quickly that individuals and colonies could not readjust themselves to the change. Other developed sectors have suffered similarly to the Many Glacier Region.

Let those who, clamoring for the opening of the last primitive valleys of the park, for Belly River, for the Kintla and Quartz regions, for the Flattop area, well remember that the charm of many places rests in their solitude and inaccessibility, that if Boulder Pass were as accessible as Logan Pass, it would be scarcely any more desireable. Let those who consider accessibility and ease alone weigh carefully which gives more enduring recollection, the dash over Logan Pass or the horseback or foot trip over Indian Pass, and learn that one appreciates in more lasting measure those things which one must gain thru the expenditure of effort. Let those who urge more roads well bear in mind that the marring of countryside does not end with the construction of a broad, two-lane highway, absolutely safe when driven at a sane speed commensurate with the full enjoyment of a National Park, but that even the gentlest curves must be eliminated, the width ever increased, each reopening a wound to leave a more gaping scar, with no more turns with delightful surprises beyond, for there are to be no turns: only greater speed and safety, tho we may well note the irony of the latter in mountainous regions where improvement always has resulted in more fatalities. Let us too recall the hundreds who dash daily over Logan Pass, without so much as a stop, or the great number who continually are like the camper from the Atlantic seaboard who boasted he had just been in three National Parks on that day and would be in Mt. Rainier on the morrow!

Despite the thousands of burned acres fringing our park, despite the areas denuded for man's improvements, despite the yellow slash across the virgin side of the Garden Wall, Glacier Park still contains some of the largest unspoiled mountain wilderness in our country. It has always been a trails park, and much of its attraction has been due to this fact. The aged and the infirm, as well as the lazy and the hurried, have been given a grand opportunity to see one of the finest of Glacier's mountain passes from comfort in an automobile. Let us stop here and be done with further rape of pristine beauty. This is addressed to those who understand the Park Service and its purposes less, yet who constantly clamor for greater exploitation. The Park Service in general, the utility operators, the majority of true lovers of Nature and the Park do not wish further development. Why must there be a constant giving in to further and further desecration?

Visualize the future of the Park. Will the national parks a hundred years from now be what we might wish them to be? We who administer must bear in mind that the direction and operation of the Park Service is a big job demanding big men--who in succeeding generations should deserve not the finger of scorn but admiration and a feeling that "there were giants in those days". In the days when the service was small and appropriations light, the task was easier. Great crowds bring greater popularity, wealth, and power, but have made more difficult the vision of the noble fundamentals and principles which started the Parks on their career. Let all who love Glacier bend every effort to keep it forever our greatest Wilderness Park.

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EDITORIAL PAGE

THE CONQUEST OF THE WILDERNESS

The greatest charm of Glacier National Park lies in its rugged inaccessibility and splendid solitude. One feels very near to the heart of the place as one treads or rides the trails with each vista gradually changing, with ample time and opportunity to be gladdened by the beauty of bush, vine, and flower, by the song of bird and hum of bee, by music of wind and stream, by form of cloud and mountain, by fragrance of forest and meadow, by the confiding nature of the wild folk. Ever so often, one visitor more imaginative and original than his fellows leaves the beaten trails to climb to some unknown meadow or lakeside, to bring back a glowing story of the beauty of an unspoiled nook, a beauty which once spread thru the whole area before trampling feet, grazing stock, stench of gasoline, roar of motors, and noisome chatter of great throngs wiped out much of the primitive. Everywhere one reads or is told of the "lure of unbeaten trails," and how much more fascinating Many Glacier, or Logan Pass, or Two Medicine was when the park was created; yet, with splendid inconsistency we hasten to "improve" and "develop" more and more--with ever broader and straighter speedways, with ever increasing denuded spaces for camping and parking, with ever growing belts of scarred, burned timber as the result of carelessness and ignorance. Isn't it about time that a cry arises of "Halt! Caution Ahead!"? Isn't it time that more careful consideration be given each "improvement", to factors such as scars on the landscape, the death of plants and trees, the destruction of homes and home-sites of wildlife, the upsetting of the balance of Nature, the diminution and destruction of the primitive?

There was overheard in a hotel the other day, a conversation to the effect that Glacier Park had never received its share of appropriations in the past, that there should be built hundreds of miles of roadways in the park to take everybody everywhere in the park in order that everyone might behold the glory of unspoiled wilderness. If lack of funds has prevented further desecration of our park, then those who love Nature can raise thankful paeans for past slight. When one considers the cost of the Going-to-the-Sun Highway in terms of the great gash along the side of the once unscarred Garden Wall, of the dead trees that crowd the roadway on either side, of landslides and loss of primitive charm, of animal lives lost daily thru man's craving for speed, a thotful being may well wonder whether the tremendous price can ever be justified.

I have before me a picture of the Many Glacier Region taken in 1911. A deep unbroken forest stretches from timberline to timberline, for then Swiftcurrent Valley was a densely wooded area like the Belly River, Cutbank, Red Eagle, and other undeveloped valleys on the Eastside. Even when the hotel was built, it was scarcely visible from the lake, tho the shore is only a score of feet away, so dense was the stand of timber on the little intervening strip of land. Today not a tree remains, and the vast sections around the lake are all but completely denuded of attractive forest cover. Similarly in the old camp ground area, where once stood a fine virgin forest of spruce and fir, scarcely a shaded campsite remains--some trees have been cut, some burned, but the vast number have died thru trampling which chokes

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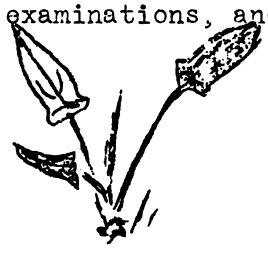
from the openings. It is here that the brilliant paint brushes, senecios, arnicas, bear grass, and fairy bells burst into flower early and fruit quickly. The saxifrage plants, or "rock breakers", add a dash of color to the sombre cliffs. It is the foraging ground of the bighorn sheep, mountain goat, conies, Columbia ground squirrel, ptarmigan, crossbills, and white-crowned sparrows. Mountain top biology is a direct result of climate and not altitude. The wind swept Hudsonian zone rapidly loses its moisture. It is extremely cold at night and surprisingly hot under a mid-day sun. Even the most careless observer sees the difference.

Perhaps you begin to experience mountain intoxication. The cool, pure air makes your whole being vibrant. You are possessed to get to the arctic-alpine peaks. The higher you go the more remarkable the plants become. You are arriving at Glacier's million acre garden with a garden wall half a mile high. Here is the flower pageant of Greenland and Baffin Land. You see the tundras of Alaska. You see how things once were from New Jersey to Puget Sound. You get a picture of plants following the retreating glaciers. You can look across to other peaks with their islands of Arctic plants. You begin to understand how heath and heather could be stranded on Mount Washington in New Hampshire. You get to the jagged edges of the mountains and precipitous slopes where you rest often and longer. You reach out and touch golden lichens. They are rock plants that can grow where moisture and soil is scarce and the sun glares and the nights freeze. Before you are miles of blue gentians, yellow buttercups, and dwarf willows. Here is matchless beauty and vivid color. The plants don't spend time in growing tall but put all their effort into color and seed, producing the most brilliant bee pasture you ever saw. It is no use to list them and you would not care to read if we did.

In a day you have traveled thru as many flower bedecked zones as tho you had walked to the Arctic. The garden walls have scarcely any soil on them. When you gazed at them from the Chalet you received no hint of their floral wealth. You scarcely dreamed that the glorious colors of sunset on the mountain slopes were partly due to lichens -- golden, red, and gray. And as you sit in the fast falling shades of the garden wall you little realize that you are becoming infected with the call of the mountains that will surely return like spring fever, and that will increase in value as years roll on. This early experience will prove to be a real bank account which will be drawn upon thruout life. Such a mental reservoir will stand in good stead in days of stress to come. The beauty and truths of science, the saga of plant life in succession, adaptation, and survival are yours on a scale that can inspire the most sluggish apathy. You have a depth and breadth of understanding that goes far back into the past, which will last longer than a week of final examinations, and which no depression can take from you.



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GETTING DINNER

E. T. Scoyen, Park Superintendent

During the early evening of June 11, while fishing near the lower end of Lake McDonald my young son and I noticed three western grebes (hell-divers) swimming in the lake. As we approached within about a hundred feet of one of them, it dived. A few seconds afterward a huge bald eagle soared gracefully forty feet overhead. When two hundred feet beyond us it suddenly dived into the lake. It came up with what we thot at first was a fish, but soon observed as the nearest grebe.

The eagle carried its victim for a distance of about four hundred yards. Not being able to ascend high enuf to clear the timber along the shore it dropped its load back into the lake. The grebe seemed stunned for a short time but soon swam away as if nothing had happened.

The eagle perched in a tree for a quarter of an hour and then made another foray over the water. It dived at each of the three grebes in turn and then flew back to his perch. This was repeated several times. At last, it soared out over the water, and picking out one of the birds, kept hovering over it. Everytime the eagle struck, the bird dived below the water. As soon as it came to the surface the attack was renewed. This must have continued for twenty minutes. We were not able to observe the final outcome as the contest shifted far out into the lake. My guess is that the eagle got his dinner.

1935 RANGER NATURALIST SERVICE

To carry on a naturalist program the following men have returned to Glacier National Park to serve as ranger naturalists for the 1935 season: J. L. Arnold, Dr. W. T. McLaughlin, Robert Nelson, and M. N. D'Evelyn. New men on the staff include J. L. Dyson of Cornell University, J. S. Garth of the University of Southern California, H. D. Michener of the California Institute of Technology, B. A. Thaxter of Yale, and Julian Vogt of the University of Colorado.

Heading the list of changes over previous seasons is the removal of the Many Glacier Museum from tent quarters to the lobby of the new ranger naturalist dormitory. Among the exhibits are those of past years. A splendid set of four oil paintings by former ranger naturalist Eugene Kingman of Yale University is being exhibited for the first time in this park. These cleverly combine art and geology. New campfire circles have been constructed at Sprague Creek and Avalanche Camp Grounds. New self-guiding trails are being installed on the Garden Wall trail from Granite Park and the trail to Trick Falls. The regular services on Logan Pass, boat services on Swiftcurrent, Josephine, St. Mary, and Two Medicine Lakes, lectures at Lake McDonald and Many Glacier Hotels and at Sun Chalets, and campfire programs at Avalanche, Two Medicine, and Many Glacier Camp Grounds are offered as during last year.

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Crows and Eagle - Eagles and great hawks are often viciously attacked by crows and ravens; these latter, in turn, are routed by smaller assailants, the kingbirds and blackbirds. A pair of crows feel that my station grounds are their particular domain, not to be intruded upon even by that king of birds, the golden eagle. During the heavy snowfall on April 8, a golden eagle alighted on the rail fence in front of the house, only to be harried impetuously by the resident pair who made vicious dives to drive him from his perch. Their daring sallies swept nearer and nearer the foe, who sat unruffled in his regal dignity, disdainful at first of such menial opponents. Finally the eagle would venture a vicious snap now and then as a crow would approach too closely, but he clung to his unwelcome perch till the attackers grew weary of the game and flew to the tops of neighboring pines to await his voluntary departure. - Elmer Ness, Park Ranger

On May 24th a pair of the brilliantly feathered wood ducks rested from their long migratory flight in the Two Medicine River.
- Clyde Fauley, Park Ranger

Birds nesting near Lubec station on June 1st included blue birds, swallows, meadowlarks, robins, sparrows, blackbirds, kingbirds, grouse, catbirds, mallards, teals, gadwalls, and golden eyes.
- Hilbert O. Krause, Park Ranger

Cold-benumbed Insects - While on a trip to Sperry Glacier, Ranger Naturalist Louis Wessel observed the large variety of insect life -- beetles, bugs, moths, butterflies, flies -- stranded on the snow and ice, apparently benumbed by the cold of the upper atmosphere.

Park Ranger Fauley makes note in his May report of his first sight of mountain sheep in the meadow above the Two Medicine Ranger Station.

On April 28 Ranger Buchanan saw twenty-two snow geese in the North Fork of the Flathead River near Polebridge.

There are two moose which have fed regularly with the deer at Nyack feed yard. - F. X. Guardipee, Park Ranger

Bobbing among the chunks of ice in a small lake near the Looking Glass, a grizzly reminded Ranger Clyde Fauley of the photos he had seen of polar bears.

Unusual Tree Growth - Tree growth this season, especially in the lodgepole pine, is very noticeable. The actual growth is about nine inches so far, and no doubt will be much more before the growing season is over. The same luxuriant growth can be seen in the flowers and grasses.
- Hilbert O. Krause, Park Ranger

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THE MEASUREMENT OF GLACIAL RECESSION

M. N. D'Evelyn, Ranger Naturalist

Under the pull of gravity, a glacier slowly flows down its course to the place where its forward movement is balanced by the melting of ice. The position of the ice front is not fixed, but advances during the months of greatest accumulation, that is, during winter time, and retreats gradually at the time of maximum melting. Besides this annual fluctuation, in a growing ice age, a glacier will gradually extend further down its valley as it grows, while in a waning ice age, the ice mass retreats further and further up the mountain side. Glaciers of the world are in general gradually diminishing in size.

In order to know the amount of recession that is going on today, the termini of four glaciers of Glacier National Park are among the ice fronts of North America whose positions are annually reported to and recorded by the Committee on Glaciers of the American Geophysical Union. Early in fall annually, the Park Naturalist makes a survey in the park, tho trips for the purpose are often made difficult or even frustrated by smoke of late forest fires, heavy early snows, disagreeably dark cold autumn days, or other natural agencies. Trips are made as nearly as possible to the time of earliest heavy, permanent snowfall in order to establish their positions just before they are buried.

In the measurement of glacial recession the procedure used in the park is to locate markers, usually piles of boulders, on opposite sides and close to the front of the ice. By sighting across these markers a line of reference for the measurement of the advance or retreat of the terminus of the ice is secured. Actual figures are obtained with a steel tape. The use of photographs taken across the markers makes possible a permanent pictorial record of the annual positions.

Trips have been undertaken annually since the markers were set in the fall of 1931. It is significant that the results have been parallel for the three glaciers on which at least two successful determinations have been obtained--Blackfeet, Sperry, and Grinnell: 1931-32 was a period of general slight advance. The winter of 1932-33 was one of unusually heavy snowfall which caused a considerable downward flow. 1933-34 was marked by unusually light snowfall and an unusually long warm summer; all three glaciers showed recession. It is predicted that 1935 measurements, following a year of moderate winter snowfall, of cold, late spring, and of a wet summer, will indicate little change over the 1934 measurements, tho a general recession will probably be recorded.

The western lobe of Blackfeet Glacier, resting in the col between Blackfeet and Jackson mountains, is part of the largest glacier in the Park, total area considered; it is reached by a side trail leading from the Gunsight trail near the foot of the lake. This is the sector visited for measurements and designated by the Park Naturalist as the Siksikaikwan Lobe, after the tribal name of Jackson who was a Blackfeet Indian. Between

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UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
GLACIER NATIONAL PARK

GLACIAL DRIFT

Volume VI July, 1933 Number 2

A popular pamphlet edited by the Park Naturalist and distributed gratis from time to time by the Educational Department of Glacier National Park to persons and organizations interested in the Park and its natural history.

Eivind T. Scoyen, Park Superintendent Dr. G. C. Ruhle, Editor

"Nature is the Art of God"

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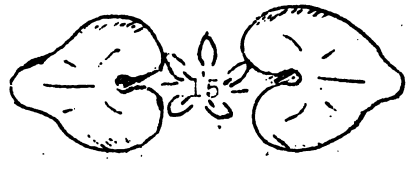
On August 9 the National Park Service ceases to exist after a score of years of administration and preservation of America's most sublime scenic areas. It becomes a part of a new bureau, the Department of National Parks, Buildings, and Reserves. Needless to say, this executive order strengthens the position of the Park Service, long proven an efficient and dependable branch of the government. This date also terminates the long record of public service of Horace M. Albright, who succeeded Stephen T. Mather as the second Director of the Park Service. Mr. Albright's untiring devotion as Director will be missed, but he assures that his active interest in the Park Service will continue thru membership in the foremost conservation societies in the country. Arno B. Cammerer, a tried veteran as present Assistant Director, will succeed Mr. Albright as the first Director of the new bureau.



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Nature has gone part of the way in meeting this situation by removing a number of the surplus animals. Rangers diagnosed the causes of death of two hundred ten park deer last winter. It is seldom possible to be sure of the cause of death, even when the animals are examined by a specialist. Animals dying from various causes are eaten by predators. Rangers used their own judgement in these cases and reported the most likely cause of death from shortage of palatable food.

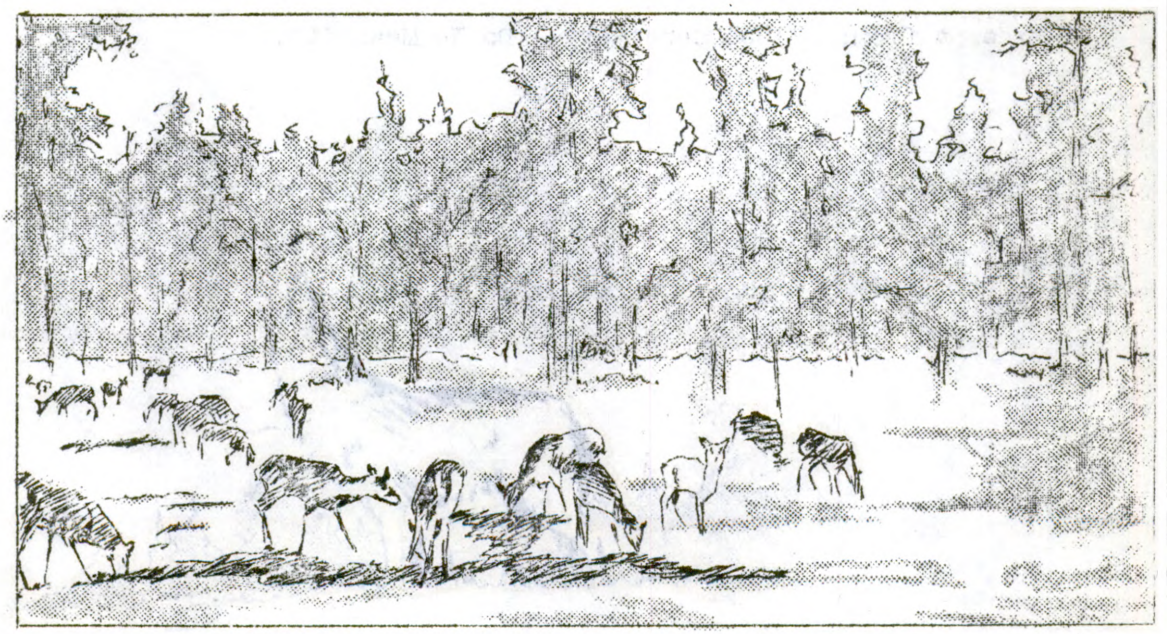
Shortage of palatable food is evidently the greatest factor at the present time, as some fifty-nine per cent of the animals investigated were reported as dying from starvation or disease. No symptoms of disease or abnormal parasite infestation could be discovered so it is probable that the food factor is the primary one as the cause of death.

Predators were forced into second place by a wide margin, having accounted for only twenty-eight per cent of the animals investigated. Eleven deer, or five per cent, were reported as dying from accident, and eight per cent were reported under causes unknown.

It must be remembered that there is no real problem in the loss of normal numbers of deer in a national park, in spite of the feelings of those who would make nature less cruel, or of sportsmen who resent the loss of game to shoot. The problem is to prevent the increase of deer herds beyond the capacity of ranges.

The game counts this year show an increase of deer over last year, so it is evident that we have not yet reached a point where losses can balance the gains. When artificial feeding can be abandoned, and the spread of deer becomes once more unhampered by mans activities, it is possible that this concentration in limited areas will be avoided to some extent, thru migration to more favorable winter range. Until this can be accomplished, it is essential that some deer be eliminated, preferably by natural forces, until the ecological balance can be established and our forest reproduction preserved.

Scene in a feed yard at Logging



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A DEER PROBLEM

Fred H. Dale
Resident Wildlife Technician

There is a serious difficulty in interpreting observations on wild animals, because of the human tendency to favor preservation of certain forms of life considered especially valuable. For this reason it is well to introduce a report of this nature with an explanation of the differences between wildlife management in a national park and game management as a commercial venture.

It is the stated policy of the National Park Service to permit animals to carry out their struggle for existence unaided, as being to their own ultimate good. In other words, a national park is set aside as a bit of wilderness where animals may form their normal ecological groups and react to the forces of nature in their own way without interference from man. In such a scheme all animals must have natural controls to expansion, and in general there is a balance between reproductive rate, and loss from natural causes. It can easily be seen that any significant interference with this balance causes a fluctuation in population. Man has practically exterminated many game animals over large areas by increasing the mortality factor thru hunting. In order to adjust the balance, he has attempted to reduce other natural controls such as predator loss, starvation, and disease, not with the primary hope of saving animal life but usually that man may play the role of arch predator and have the lion's share of the game. In the national park, however, man has handed his rights back to the forces of nature, so these other controls must of necessity operate to a greater extent than in areas outside the parks.

Studies carried on during the winter by rangers, and directed by the park wildlife ranger and the resident wildlife technician, have outlined the winter range of the larger game animals within the park, and have been making an attempt to discover what trends are present in game populations and what controls are acting to keep numbers within a satisfactory limit. To sum up the results of the study in a brief report, it must be said that deer are still increasing in Glacier National Park. Unfortunately what deer reside in the park are forced to concentrate in relatively small areas, where snow conditions are most favorable.

In these concentration areas there are deer in such great numbers that a great portion of normal food has been depleted, and less palatable forage has been resorted to, much to the disadvantage of forest reproduction. Fir has been eliminated as reproduction over large areas, and lodgepole pine has been severely attacked in concentration points. Spruce offers the most resistance, largely because of its low palatability, but even this tree is modified in a few areas. Nearly all trees small enuf to be available have been grazed until their normal growth is greatly endangered.

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WILD FLOWER STUDY IN GLACIER NATIONAL PARK
III. The Decalog for Biological Studies

William Gould Vinal

1. Thou shalt not worship graven textbooks, definitions, the recitation, subject matter, or established forms. Rather that there be educative experiences, open-mindedness, judgment, much discussion, and growth. The student and not the subject is the center of departure.

2. Thou shalt approach the outdoors trustingly. Shun all irrational thinking. Believe what you see. Use your eyes, ears, nose, touch, and taste to gain information. Be slow of judgment. There is no room for supernatural intervention. The fear of bears, wolves, and snakes has been created by man in his own mind.

3. Thou shalt avoid undue slothfulness of hand or brain. Leisure time is here. Nature recreation to keep the mind and body employed is building morals.

4. Thou shalt not hunt, kill, wound, or capture. Thou shalt build fires with much caution. Thou shalt leave nature unspoiled that others may enjoy it. Thou mayest hunt with a camera.

5. Thou shalt intergrade the potency of laughter and play. Excessive seriousness is dullness. Don't be too serious about the need of knowing adventitious buds; reticulated or netted-veined leaves; whether it is a corymb, spadix or panicle; or whether it is a dehiscent or indehiscent fruit. The passion for jig-saw puzzles or having a good time on a flower trip may not be so irrational as it seems.

6. Propose to keep thy body at its best. Intellectual botany is one-sided. Some botany classes are run as tho the students are going to act as botanists and not as educated people. Hiking botany is as practical as table botany. If we leave out significant elements we are neglecting our opportunities. There is simple clothing for a hike. It is not sinful if we do not sit quietly at a laboratory table.

7. Thou shalt not bear false witness. Too many believe that four-leaf clovers bring good luck; that bears eat bear grass; that bear grass is a kind of grass; that mountains are usually an upheaval; that a mountain range is a ridge; etc., etc. Let them know that the mountain ash is an apple and the dog tooth violet is a lily. Let them demand to be "shown things" like the famous gentleman from Missouri. Are we using the best environment and experiences? All are honest as to the need of conservation.

8. Thou shalt not lose faith in the intellectual. This is an age of faith in the potentialities of Glacier National Park. Everyone should have the opportunity to explore his powers.

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9. Seek beauty. Go to the beautiful in nature instead of talking about it. Preserve natural beauties instead of practicing ruthless destruction. Nature heals the wounds of depression.

10. Seek heroes worthy of emulation. Tell me the hero in your heart and I can tell you what you are. If it is a Muir, Thoreau, Emerson, Lowell, your soul is founded on a rock.

GOING-TO-THE-SUN MOUNTAIN

- Norman Clyde

Most picturesque of a conclave of picturesque peaks, surrounding exquisitely beautiful St. Mary Lake, Going-to-the-Sun lifts its bold brow to the heavens. Bright in the sunlight and arched by a cerulean sky, glowing in moonlight and reflected in the waters of the placid lake, or wreathed in storm clouds that linger about its rugged summit, it is the most fascinating of all the fascinating mountains that encircle the lake at its feet.

As the eye follows the array of peaks that rise from the border of the lake or extend along the crest of the Continental Divide, a few miles westward, every mountain possesses an individuality and a distinctive charm. To the south and directly across the lake are Red Eagle and Little Chief Mountains, both picturesque, especially the latter. Westward from Little Chief is Citadel, a strikingly-sculptured, vertical-walled peak; along the Continental Divide the eye is arrested by the spire-like form of Fusilade and lingers with delight on the campanile lines of Reynolds; but it returns to Going-to-the-Sun towering thousands of feet above the blue lake, as the most striking and imposing of all.

Often in the bosom of the lake the rugged forms of the peaks are ranged as vividly in reflection as in reality. In early morning when the rays of the sun pour over the mountains, their radiant masses are refulgent a second time in the depths of the lake; when the moon floods them with soft splendor they glow in the profound depths of St. Marys. But by daylight or by moonlight, in storm or in sunshine, Going-to-the-Sun is king of a glorious throng of magnificent mountains.

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GLACIAL DRIFT

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House Warmer - A grizzly bear preceded the opening crew into Sun Chalets this season. Crashing an entrance thru the glass of the kitchen door, he explored the bake shop and its sweet smelling bins, smashed a window here and there, and made his exit, leaving no mess other than the broken glass - Arthur R. Best, Park Ranger

Goat Shelter - Among animals taking advantage of the works of man, make room for the new-comer -- the mountain goat. Signs, much in evidence, pointed to its using the eastern tunnel of the Going-to-the-Sun Highway as a shelter during the months of winter.

Thirteen-lined - The thirteen-lined ground squirrel (Citellus tridedemlineatus), rarely seen in Glacier Park but common in the Midwest and widely distributed thruout North America, was found by Ranger Elmer Ness in his Belly River station and also along the river a short way below the Waterton Lakes Park. This animal advances but little into the mountains from its natural habitat on the plains.

Spring Arrivals - Because of deep snows, most birds arrived at much later dates than on previous years. A robin appeared at Belton on March 6, but not until the 27th was another noted. Other recordings for Belton follow: March 26, varied thrush; April 1, flicker; April 23, ruby-crowned kinglet; May 6, Cassin vireo; May 9, Townsend warbler, sparrow hawk; May 17, Wright flycatcher; May 31, tanager. On May 17, the park naturalist heard white-crowned and fox sparrows singing in the brush near Logan Creek altho the gauge showed thirty-nine inches of snow by the snowshoe cabin. Robins were seen at Logging as early as March 6, but were not reported until March 24 at Walton and Glacier Park, or March 25 at Many Glacier, or March 26 at Waterton. Meadowlarks were seen at Logging Station on March 14, while bluebirds appeared at Polebridge on March 17. Ranger Fauley saw a crow at Two Medicine on March 15. Geese were reported flying north on March 28 at Glacier Park and Waterton Stations.

Caw-caw - The caw-caw of the crow has come to mean a sound of derision to many, but Park Ranger Clyde Fauley of the Two Medicine District takes a bold stand for the outcast in his April report; "While sportsmen and nearly everyone else is fighting the existence of the crow, I am always glad to welcome the so-called black villain each spring. Without its cheerful cawing at daybreak something would surely be missing in the spring opening of the mountains."

Sperry Glacier Shifting - Sperry Glacier has shifted its position since I saw it twenty-seven years ago. At that time its main body rested against Gunsight Peak; now it lies against Mt. Edwards.
- Louis Wessel, Ranger Naturalist

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GLACIAL DRIFT

JULY 1935

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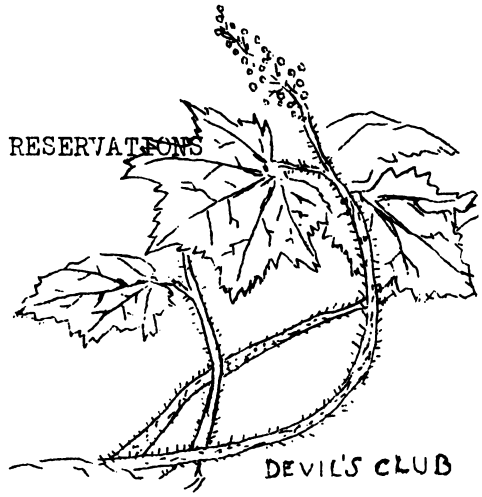
UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF NATIONAL PARKS, BUILDINGS AND RESERVATIONS
GLACIER NATIONAL PARK



GLACIAL DRIFT

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A popular pamphlet edited by the Park Naturalist and distributed gratis from time to time by the Educational Department of Glacier National Park to persons and organizations interested in the Park and its natural history.

Eivind T. Scoyen, Park Superintendent Dr. G. C. Ruhle, Editor

"Nature is the Art of God."

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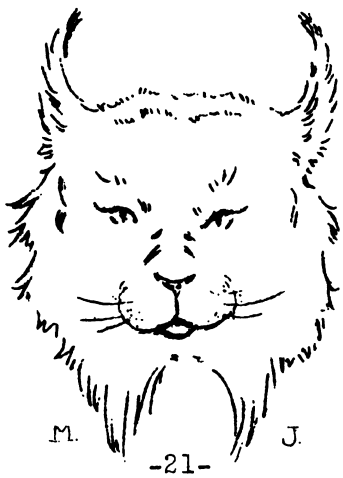

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Obituary - Several of Glacier's old timers succumbed during the hardships of January. Frank Geduhn, who settled at the head of Lake McDonald in the early nineties, passed away in California on January 10. He was followed by his neighbors of many years, Mr. Frank Kelly on January 15 and Mrs. Frank Kelly on January 16. The aged couple were stricken with pneumonia in the snow bound cabin, twelve miles from the nearest doctor. It was only after a heroic struggle with plow, caterpillar tractor, and snowshoes that assistance could be brought to them in their forest home.

In January, a snow slide off Double Mountain killed eight bull, six cow, and one calf elk.

A meadowlark appearing in the barn at Polebridge in early March succumbed to a bitter cold snap in early April.

Ranger Croghan reported that on his late spring inspection trip he observed deer in isolated areas away from feedyards in much better condition than those loitering around and subsisting on hay at feedyards.

In March alone Ranger Fladmark fed 8.7 tons of hay to whitetail deer made dependent upon man by years of feeding and starving because of overgrazing and artificial concentration in small areas.

Bear or their signs were first seen this spring as follows: by Ranger Newberry at Road Camp 8 on March 11; by Ranger Miller below lower Park Creek snowshoe cabin on April 29; and by Ranger Peyton at Grinnell Lake on the same day, April 29.

Apparently at Two Medicine coyotes kill few snowshoe rabbits, tho they dine quite frequently upon them. The big owls kill great numbers of rabbits, leaving the backs and hind legs for the coyotes.
- Clyde C. Fauley, Park Ranger

Ranger Best reported otter in Midvale Creek, in which they have never been reported before.

Again cottonwood trees around Goathaunt Chalets had to be protected with wire and screen from felling by beaver. The fine birch grove around the camp also had to be carefully watched to keep it from despoliation by these busy creatures. - L. O. Hanson, Park Ranger

Richardson ground squirrels have been out of hibernation at Duck Lake since the middle of February. - Arthur R. Best, Assistant Chief Ranger

The first geese to return to the park's eastside were several white ones which were promptly shot by an Indian who was nearby. The Migratory Bird Act is not observed on the Reservation. - Clyde C. Fauley, Park Ranger

Buttercups in full bloom appeared on the meadow bordering the north shore of Upper St. Mary Lake as early as March 18. - Elmer N. Ness, Park Ranger

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THE GOING-TO-THE-SUN HIGHWAY

M. N. D'Evelyn, Ranger Naturalist

Rising from the softness of evergreen forests to the boldness of serrated peaks, displaying an untold wealth of mountain splendors thruout, Glacier Park's two and a quarter million dollar Going-to-the-Sun Highway climaxed a decade of construction with its dedication on July 15. Already thousands have been soul-stirred by the brilliance of its mountain meadows, the glisten of its snow banks, the glitter of its dashing falls, and the grandeur of its far-flung panoramas into the fastnesses of America's most rugged, most tumultous mountain range.

From Bolton to the summit on the west side the motorist rises thru four thousand feet of untrammeled wilderness. Leaving the forested shores of expansive Lake McDonald the route follows the meandering course of McDonald Creek, a foamy torrent rushing in a gorge of red argillite boulders, a quiet brook rippling over a bed of water-worn pebbles. Breaking the long avenues of towering trees are slopes swept clear of timber, the yellow green of their shrubby growth sharply delineated against the deeper color of forest as yet escaped from the irresistable avalanche.

The long six per cent grade begun, the highway plunges into the sombre shadow of a tunnel. One of the superb views of the Going-to-the-Sun Highway is framed in the rocky irregular outline of a window of this tunnel - that of the monumental Heavens Peak, ever capped by shining banks of snow.

After making a switchback the highway is almost immediately shelved on the face of a perpendicular cliff. There the Herculean task of hewing this road bed out of solid rock becomes apparent. The careful observer will note, still dangling from the trees overhead, the ropes that had been used to lower workmen down the cliff for setting the initial charges of dynamite to blast out this right of way. Nearly one pound of explosives was necessary for each cubic yard of material removed.

The great pageant of peaks towering overhead, opening with Brown and Cannon and gaining pitch with the Garden Wall, Haystack Butte, and Mt. Pollock, reaches a glorious climax on the Continental Divide at Logan Pass with its host of alpine splendors. Precipice bordered and aptly named the Hanging Gardens, luxuriantly green, mossy meadows, dotted here and there by clumps of stunted timber line trees and carpeted in the spring by golden glacier lily blooms, stretch to the shale slopes of surrounding peaks. A short walk reaches small Clements Glacier with its chasms of transparent blue ice and its pyramidal stretches of moraine, or takes one for a view of Hidden Lake, a gem of turquoise set in a steep-walled cirque a thousand feet below. A look to the horizon from a hundred places rewards with a panorama of sublime grandeur. To the north and west, range upon range of blocky, snow-capped peaks - Kipp, Trapper, Anaconda, Cathedral, Vulture, Guardhouse, and Kootenai - steeped in an

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TILL

Early Crop - It is generally known that mountain goat kids are born in late April or May. Ranger Ben Miller was surprised to see two young kids on February 27 frolicking on a ledge a thousand feet above him in Upper Park Valley. "At first I thot I must be mistaken; I watched thru a pair of eight-power binoculars. When, however, I saw them nursing, I was convinced that they were kids, despite the early date". He saw one of them again on February 28.

Reservation Moose - Seldom are moose seen east of the Continental Divide in the park region. Three wandered out of the park, their tracks appearing on Hudson Bay Divide near the highway. Several Indians immediately started to hunt them, but the animals had vanished. It is reported that a sadder fate awaited two other moose that moved ten miles below the park boundary on Cutbank Creek, for they were quickly killed by reservation hunters. As food is plentiful, no doubt these grand animals would soon establish themselves in numbers along these river bottoms if they were given even a few years to do so. - Thomas E. Whitcraft, Chief Ranger

Sic Transit Gloria - In February, when bull elk are about to shed their antlers, they withdraw from the main herd and bunch up by themselves. Evidently an inferiority complex seizes them, or like the man who has just had all of his teeth pulled, they loathe having the females see them minus their antlered glory. - Ben C. Miller, Park Ranger

Deer Feed - There are probably about seven hundred deer in the Logging District, of which I counted 483 individuals in February. All thru that month there was a good crust on the snow, and one would expect that they would scatter out for food, but instead they lingered closer than ever to the feedyard. The result: I fed almost four tons of hay to them during the month. - Elmer Fladmark, Park Ranger

At Play - On the sixth of February, I noticed an unusual number of coyote tracks on Logging Ridge, all leading in the same general direction. Proceding with extreme caution, I discovered a coyote sitting on a log. He was deeply interested in something outside my vision. As the wind was in my favor, I successfully crept up very near, suddenly to see a most home-like scene. Two small pups were tussling and rolling over each other, while a third sat enrapt nearby. When finally the one became tired and winded, the winner and watcher took up the contest. Nearby two other mature coyotes were gorging themselves on a freshly killed fawn, while a doe, perhaps the mother of the fawn, stood a short distance away, also deeply interested in what was going on. For ten minutes, I watched and gradually drew closer. Suddenly the first coyote bolted off to the woods, having apparently discovered my presence, and all of the rest followed. - Elmer Fladmark, Park Ranger

Two Medicine elk browse very little, but keep fat on the abundant bunch grass on the valley floor. - Clyde C. Fauley, Park Ranger

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atmosphere of adventure and unexplored wilderness even to their very names. To the east and south, the great paragon of Going-to-the-Sun Mountain, a corner of the emerald of St. Mary Lake, hemmed in by Red Eagle, Little Chief, and Citadel, and finally and abruptly, the endless plains.

Dropping down the east side the road is soon margined by a dripping snow bank, trouble for the crew that must shovel eighteen or twenty feet deep to reach the road bed in the spring, but all summer the delight of visitors from tropical and sub-tropical climes.

The engineering masterpiece and construction achievement of this transmountain highway is met at a second tunnel, this one over four hundred feet long. Two thousand feet of perpendicular rock necessitated the hewing of a new trail from Logan Pass to reach the site, the carrying of cumbersome tools and materials down over a hundred feet of rope ladder, and the initial use of archaic hand equipment. Probably sixty per cent. of the material removed for the highway was solid rock, but the supreme challenge to the ingenuity of the engineers was met with the boring of this tunnel.

From the tunnel the road drops quickly into a forest again, and skirts spectacular St. Mary Lake to terminate by joining the Blackfeet Highway that parallels the Park's eastern mountain face. Contrasts add greatly to the interest of this eastern end of the transmountain highway. Its forests of spruce and Douglas fir, so characteristic of the mountains fringing the Great Plains, differ widely in appearance and composition from the luxuriant vegetation of McDonald Valley with its cedars, hemlocks, and western white pines. Ahead, the grassy plains billow to a purple horizon, with, perhaps, a chuck wagon or lone shepherd and flock topping some rise.

If the reverse drive is made, proceeding from east to west, an entirely new set of views will greet the motorist, who is advised to make the trip in both directions, if possible.

These fifty-two miles of unexcelled mountain scenery are a lasting tribute to Stephen T. Mather who, as first Director of the Park Service, took the lead in advocating the construction of the transmountain road. His bold prediction of 1919 asserted, "It is doubtful if any other road in America can in the same distance unfold ... such a grand array of beautiful forests, dashing torrents, wonderful gorges and valleys, towering cirques, and a vista of bold needle-peaked mountains and serrated escarpments which are found in our northern Rocky Mountains ... "

In the early summer when winter snows still whiten the peaks, a month later when the golden glow of myriads of blooms follow in the wake of the melting banks, in the fall when the scarlet and yellow of the mountain ash and maple run riot on the shrubby slopes, a plaque set in a huge red boulder

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MOVIES

Ben C. Miller, Park Ranger

On March 23, Assistant Chief Ranger Croghan and I had opportunity to study a marten at close range, and to have him perform for us at the Coal Creek Snowshoe Cabin. I had thrown out of the cabin door two loaves of moldy bread and some pieces of moldy ham. Ever ready blue jays and camp robbers gathered immediately for a feast, and we watched them as we prepared supper. At dusk they vanished, leaving most of the food uneaten. We were waiting for the stew to finish cooking when a violent rattling started in the gunny sack of emptied tin cans hanging outside the cabin door.

"There's my marten now in the can sack," I explained to Charlie.

Charlie slipped across the room, cautiously opened the door, and thrust his head outside. Suddenly he jerked it back, as if something had hit him.

"What's the matter?" I asked.

"He was a lot closer than I thought, and as he bolted out of the sack, he swished his tail across the end of my nose," Charlie replied.

We went outside and looked around; there were plenty of tracks, but the marten had vanished, and with it the bread and meat. How a marten can drag off a pound and a half loaf of bread without leaving the slightest trace of doing so was a mystery; the flashlight revealed no signs of dragging whatever.

I threw out another piece of ham and watched with the flashlight. To our surprise, the marten came out of its hiding, apparently not at all disturbed by the beam of light. Charlie said he would like to try to get a motion picture shot, so we hung out the gasoline lantern for illumination. A slice of ham tied to a stake ten feet from us set the stage.

In a short while a bright-eyed head was poked out of a hole and turned this way and that, the keen nostrils scenting the air. Satisfied, it pulled forth a sleek body after it, and the beast sat there awhile. All at once it dashed over and up the stake, pounced upon the meat, and started a plunge back to its hole. A snap of its head by the securely tied meat stopped it short. This didn't discourage him; he began to chew on the meat with snarls and growls. Then he tried a variation of climbing up the stake, down the other side, and tugging in that direction. Still the meat held. Again frustrated he started chewing on the meat in a businesslike manner so that one certainly would not think that he had made away with two loaves of bread and a quarter of a pound of ham such a short time before.

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shall stand on the climax of this glorious route in memory of the far-seeing genius of Stephen T. Mather. Emblazoned in lasting bronze are the words - "Stephen Tyng Mather July 4, 1867-January 22, 1930. He laid the foundations of the National Park Service, defining and establishing the policies under which its areas shall be developed and conserved for future generations. There will never come an end to the good that he has done."

THE LOGAN PASS INDIAN CEREMONY

G. C. Ruhle, Park Naturalist

Fortune has favored few white people to be witness to the pageantry, blazonry, and solemnity attentant to certain significant events of aboriginal history, especially those of intertribal nature, such as peace pacts. Astride the Continental Divide which parts its waters thru the tortuous course of the Columbia to the Pacific and thru the Plains-bounded Saskatchewan to distant Hudson Bay and hemmed in by craggy mountains, rugged and forbidding as those in fantastic prints, and wildly in harmony with the aborigines who prowled thru their fastness, representatives of the Peigan (Blackfeet), Salish (Flathead), and Kootenai tribes, inveterate enemies in days of the buffalo, congregated to seal a pact of peace and to celebrate the frindliness that has long existed between them. It was a day and an occasion already notable for several reasons: it honored the memory of the father of the National Park Service, Stephen T. Mather; it observed the first anniversary of the International Peace Park; it marked the opening of the Going-to-the-Sun Highway, the only transmountain road within the wilderness of Glacier National Park. History in the making was staged before the eyes of almost five thousand spectators, gathered primarily for the dedicatory opening; they departed, chanting the praises of the spectacle which chance had brought to them.

When early in the year a ceremony to open the new highway was discussed, it had been suggested that a few Indians be assembled for color to smoke the peace pipe and to dance. The matter was presented before the Indian councils, where it took an astonishing turn. In the days when buffalo blackened the Great Plains with their numbers, the Blackfeet, feared and hated, roved as masters of the headwaters of the Missouri. Back of protective mountain ruggedness dwelled the Flatheads, Kootenais, and other tribes that ever sallied forth on the expanse of plains to collect their share of meat and hides, and to wage incessant and desultory warfare against the Blackfeet. Not since 1868 had the pipe of peace passed between the head chiefs of the three tribes tho the fires of hatred had long since been dulled and quenched by the passing of the buffalo and the ascendancy of a newer generation. Here was opportunity presented to assert the peace that had been lasting and to confirm the friendship that had grown with the years. The three tribes agreed among themselves, quite independent of Park or Indian Services, to smoke the pipe not in sham but in all the earnestness and sincerity of their departed ancestors.

Not even the dire misfortune of an accident to a truckload of Flatheads which snuffed out two lives could diminish the ardor with which the Indians entered upon what they considered their hereditary duty. To the

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The summer of 1936 will see the opening of the spectacular short-cut from Glacier to Watertown Lakes National Park in Canada. Leaving the Blackfeet Highway a few miles north of Babb, Montana, the road follows a north-westerly direction direct to the village of Watertown and virtually halves the distance between these two points as compared to the old route via Cardston, Alberta.

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Facilities for the accomodation of visitors to Glacier National Park represent an investment of approximately two million dollars. More than three fourths of the total amount is devoted to provide lodging and meals for guests by the Glacier Park Hotel Company. The Glacier Park Transport Company operates a fleet of seventy five busses and passenger carrying vehicles. The Park Saddle Horse Company owns eight hundred horses and is the largest company of its kind in the world. J. W. Swanson of Kalispell provides boat service on most of the larger lakes.

By the end of 1935 there will be nearly 1,000 miles of trails in Glacier National Park. One half of these are in regular use by park visitors during the summer months. The remainder are used principally for patrol and fire protection purposes.

The report of the Superintendent for 1911 gives the total trail mileage of 146 miles as being in "fair condition".

Fishing in the streams and lakes of Glacier Park have been maintained during the past 25 years by the planting of 27,000,000 fish mostly trout and grayling. In addition land-locked salmon were planted in St. Mary's Lake in 1932. A fish hatchery has been in operation at Glacier Park station for a number of years to supply the needs of the park. However, greatly enlarged facilities are needed, and an estimate for a new hatchery lay-out to cost $70,000 has been submitted by the U. S. Bureau of Fisheries. It is hoped that this item will be included in the new Public Works program.

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Thru an Act of the Montana Legislature approved February 17, 1911, the Federal Government has exclusive jurisdiction over lands in Glacier National Park. All laws both state and national which apply in the park are enforced by the park ranger force of 19 men. The government employs a resident U. S. Commissioner who is authorized to hear evidence and inflict penalties for violation of the various park regulations. Procedure is much the same as in the average justice court.

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An interesting event of the year 1916 in Glacier National Park was a six weeks horseback trip through the park by Mr. Harold L. Ickes then a lawyer of Chicago, Illinois. Mr. Ickes did not return to the park until 1934 when, as Secretary of the Interior, in charge of the administration of all National Parks, he made the trip with the President's party. In a

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In the above list Mr. Eakin served as Superintendent of Grand Canyon National Park in Arizona between his terms of duty at Glacier.

From May 16, 1912 to November 30th of the same year Robert H. Chapman of the U. S. Geological Survey served as Acting Superintendent. Prior to 1925 Henry Hutchings served several periods in this capacity as has Robert R. Vincent since that date, and George E. Goodwin for a few months in 1917 and 1920. Until 1920 selections of the Superintendent and most of the other park officials was on strictly a political basis. At present all regular positions in the park are under the Civil Service.

In reviewing administrative problems in Glacier National Park during the past 25 years it is doubtful if any of the park superintendents have found themselves in a "hot spot" comparable to W. R. Logan, the first man to hold this position, when he took over his duties on August 8, 1910. In a report to the Secretary of the Interior Logan stated, "Shortly before I reached the park and assumed charge as superintendent forest fires broke out in various portions of the reservation, and immediately upon my arrival I devoted my attention to fire fighting. My entire time was taken up in checking them". Not only in the park but thruout the whole Northwest, 1910 is remembered as the worst fire year in history. With meagre equipment, practically no trails or roads, and no trained organization Mr. Logan was faced with a discouraging problem. During that terrible summer about 100,000 acres in Glacier were burned over.

During 1934, when severe drought and high temperatures brought about the worst conditions since 1910, a total of thirty seven fires burned over only 232 acres in the park. Detection systems, organization, equipment, and transportation for fire prevention and supression have been greatly improved during the 25 years of park history.

Altho[illegible] nearly three million dollars will have been spent on the road system in Glacier National Park when it is completed the total mileage of modern highway in the park will be but 70 miles. In addition there are 65 miles of secondary road all of which were built prior to the establishment of the reservation.

Due to the extremely rugged topography road construction is a very expensive item in the park's development program. Along the Garden Wall approaching Logan Pass on the Going-to-the-Sun Highway costs reached a hundred thousand dollars per mile. However, these expenditures have resulted in a road thru the heart of the park which all world travellers pronounce the most spectacular and scenic on the globe.

In addition to roads in the park the Blackfeet Highway which skirts along the east boundary from Glacier Park Station to the Canadian border, a distance of 48 miles is under the jurisdiction of and maintained by the National Park Service.

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The first known reference to a possible international use of the two parks was made by the late Senator Penrose during a debate on the Glacier Park bill on January 25, 1910 when he told the Senate , "This park will be international in character".

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In the 25 years since its creation in 1910 a total of 867,940 people have visited Glacier National Park. There is hardly a country on the face of the globe which has not sent at least one representative to Montana's great wilderness.

Aside from the first two years when things were being started the low mark was established in 1918, the war year, with 9,086. From this date to 1930 there was a steady increase to 73,776. Depression years caused a decrease to 53,202 in 1932. The record was set during 1934 with 116, 965 visitors. During the silver anniversary year of 1935 it is estimated that 180,000 people will visit the park.

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The entrance registers to Glacier National Park contain the names of many people of international fame. However, at no time in the history of the park, or any other park, has such a large group of distinguished persons passed the park gates as during 1934. Heading the list was President Franklin D. Roosevelt and his party, who spent August 5 making the trip over the world renowned Going-to-the-Sun Highway, and visiting other points in the park.

Only three of the western National Parks have been honored with a presidential visit- Yellowstone, Glacier, and Zion.

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Seven men have held the position of Superintendent of Glacier National Park during the 25 years of its history. In addition 4 others have served as Acting Superintendent during times when there was a vacancy in the superintendent's position.

The first to hold the job was Major William R. Logan, whose brother Sidney is a well known lawyer residing in Kalispell, Montana. Mr. Logan took charge of the park on August 8, 1910 and was active until his death on February 7, 1912.

Other superintendents with the dates of their service are:

James L. Galen, Dec. 1, 1912 to Aug. 5, 1914.
Samuel F. Ralston, Aug. 6, 1914 to June 18, 1917.
Walter W. Payne, Aug. 16, 1917 to June 30, 1920.
J. Ross Eakin, May 12, 1921 to Jan. 8, 1924.
Chas. J. Krabel, July 1, 1924 to Feb. 25, 1927.
J. Ross Eakin, April 11, 1927 to Jan. 15, 1931.
Eivind T. Scoyen, January 16, 1931 ----------.

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TWENTY FIVE YEARS OF HISTORY

E. T. Scoyen, Park Superintendent

On May 11th, Glacier National Park observed the silver anniversary of its establishment. On that date in 1910 President Taft signed the Act of Congress creating the park.

This final act of approval brought an end to agitation which had its first impulse in 1901. At that time George Bird Grinnell had published an article in the Century Magazine, "The Crown of the Continent", which first called attention of the world to the exceptional beauty of the region and urged its conservation. Mr. Grinnell was well qualified to write on the subject as he had hunted over practically the entire area and was the best known conservationist of his day.

Very little progress was made until Senator Thomas Carter of Montana became interested and introduced the first bill in the Senate of the United States on December 11, 1907. However, this measure was not very satisfactory and on February 24, 1908 the Senator introduced a substitute bill S 5648. This was passed by the Senate on May 15, 1908, but the House failed to take action and the bill died when the 60th Congress ended.

When the 61st Congress convened Senator Carter again introduced the measure on June 26, 1909. With some amendments this was the one which was finally passed and approved by the President 25 years ago.

While under consideration in the Public Lands Committees of both the Houses the bills were under the personal guidance of the other members of the Montana Delegation at that time, Senator Joseph Dixon and Congressman Charles N. Pray. Mr. Pray is the only one of the three still living and is now U. S. District Judge in Montana.

It was a far more difficult job to pass the bill thru the House than it was thru the Senate. There was strong opposition in the former body while in the latter the active support of Senator Boise Penrose of Pennsylvania, for many years virtual dictator of the Upper House, assured passage from the moment it was introduced. The Senator was intimately acquainted with the region as a result of several hunting trips and had a keen appreciation of it's scenic values. During one of these expeditions his brother was nearly killed by a wounded grizzly just south of the park.

Since the Park was created there has been no changes in its boundaries altho some have been proposed. In 1932 the U. S. Congress and Canadian Parliament passed laws establishing the Watertown-Glacier International Peace Park. Watertown Lakes Park in Canada joins Glacier to the north. The object of the Peace Park is to commemorate and perpetuate the 120 years of good will between the two English speaking nations.

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If the Indians had come upon us that night we should have seen twice as many as there really were. In the latter part of August we reached Quartz Lake. A few days later Crow found his largest gold nugget which weighed thirty ounces. He found this nugget at the waterfalls directly northeast of the lake. Now we knew our permanent camp must be located here. Leaving Crow at the place, Moloniex, Brown, and I went back after Mr. X. The round trip took us nearly a week.

Assembling at Quartz Lake, we started the construction of a one room cabin, situated on the northeast corner of the lake. Winter descended on us after we became settled. Brown now informed us that he was going to California for supplies. Crow intended to remain all winter with Mr. X at Quartz Lake, while Moloniex and I decided to go with Brown. Our party started out about the latter part of September during a heavy snowfall.

We headed toward Grange City and reached there about the middle of October. Without stopping, we continued on to California. The weather was very cold and deep snow made traveling difficult. We had planned to go by boat down the Columbia River, but Brown decided to see the sequoia country of California, so we continued on horseback. We traveled across the Sierra Nevada and down the west side slope of these mountains to San Francisco, reaching that city about the latter part of December. Brown paid Moloniex nine hundred dollars, based on seventy-five dollars per month for a year's service altho we had not been on the trail a year. I received four hundred and eight dollars. We remained in San Francisco for a few weeks, enjoying city life once more.

When Brown went back he was completely outfitted. We bade him goodbye and Moloniex and I went by horseback to our homes in Texas. I never saw anyone except Moloniex of the party after that. Mr. X had two burros loaded with fur at the time Brown, Moloniex and I went to California, but I suppose he had considerably more upon his departure from the park.

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* Apparently not Glacier's Piegan Blackfeet, but rather Sihasapa Sioux, also called Blackfeet, and unrelated to the former who are of Algonkian, not Siouian stock. ** This is questionable. - Ed

The Author - Some time ago a letter came to the park from G. Veach of Sicklerville, New Jersey, with the information that his grandfather had hunted in the park region nearly sixty years ago. A request from us brot forth the above interesting narrative, which, except for minute details, can be accepted without question. Mr. William Veach was born in Texas in 1860, and was a husky lad of sixteen, six feet tall, when hired by Mr. Brown as hunter and cook for the party. In the winter of 1882, he served with the U. S. Marine Corps at Fort Assiniboine. Further information reveals that Crow was a tall, slim half-breed Indian, 38 years old. Moloniex (also spelled Molonioux and Mollinex) was almost six feet tall, and forty years old. Mr. X was a lean man of 35, whose name, as closely as Mr. Veach can recall it, was Slade, Sloan, or Slater.

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of passable ground. In some sections rockmen have tugged on rope ladders anchored to vertical cliffs to bite their way into solid rock, soon to harbor a trail. Frequently in these descents the workmen have taken a sixty pound jack-hammer or a fifty pound case of dynamite and have gone to work on ledges where a fall means a non-stop drop of 500 to 2000 feet and certain terminus at the "Happy Hunting Grounds". Have you ever watched a worker bouncing around as he rides a chattering pneumatic drill? Can you imagine him doing the same while perched on a precarious ledge with a yawning abyss below?

Other feats are packing compressors and similar heavy equipment many miles into construction locations. This is done by mules trained to carry heavy loads in dangerous and narrow places. Building bridges over swift and icy streams, often many feet below the trail, is another problem which taxes the ingenuity of the engineer and skilled artisian who cannot call upon reinforced I-beams or suspension cables for construction aids.

Of the many engineering feats of trail building of particular importance are those to be found near Gunsight Pass, Triple Divide, Ahern Pass, and Ptarmigan Wall. Compressors, jack-hammers, dynamite, and human skill have played a part in conquering these dangerous passes and making the Park more accessible and comfortable for the tourist. Expense has been heavy, these bypaths of pleasure often costing from $2500 to $3000 per mile. This figure does not include upkeep, which each year matches a considerable portion of the original cost. Men and horses have given their best so that the trails might be satisfactory for even the most timid tourist.

Probably as spectacular and as difficult as any trail undertaking has been the Ptarmigan Wall tunnel. Built for the purpose of connecting the Belly River country with that of Many Glacier and to eliminate the long and tiresome trip over Red Gap, this tunnel will stand as a monument for future generations. 185 feet thru the hardest strata in the Park, 7500 feet above sea level, and over 75 miles from the nearest railroad, this work dazzles the imagination of even the most conservative. This undertaking cost in the neighborhood of $4000 and has made it possible for the hiker to look down a sheer 1000 feet to Elizabeth Lake, which feeds the Belly River. From its south portal Mount Wilbur, Mount Gould, Going-to-the-Sun and other magnificent peaks may be viewed.

The newly constructed trail over Gunsight Pass is another marvel of engineering science. Following the time-worn trail that was used by the Blackfeet and Kootenais for centuries on their hunting trips, this frequently travelled ribbon of wonder dodges snowbanks and overhanging cliffs to the crest where can be seen snow-clad glaciers clinging to the peaks, and lake-studded valleys divided by reflecting waterfalls.

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Perhaps Judge No Coat detected doubt in my face as he told the story, especially when he told the circumstances and details of the last battle, for he remarked, "If you don't believe this don't blame me or call me a liar. I am only telling it to you the way it was told to me. His statement is repeated for consideration by the reader.

AN EARLY TRIP INTO GLACIER PARK

William Veach, Sr.

Early in April 1876, I was a member of a party of five who left for the northern Rocky Mountains on a prospecting trip. The others, excepting one whom I no longer can recall, were: Emerson Brown from Arizona, who was interested in the timberland of the Northwest, and who had charge of the outfit; "Blackie" Crow, a prospector, also from Arizona; Thomas Moloniex, the interpreter, guide, and scout for the party, who had been in this country before and who spoke the Blackfeet language. I was cook for the party, and killed the game. We never took advantage of the abundant game that inhabited that part of the country, but killed only what was necessary to live on.

Our party, departing from Fort Worth, Texas, selected a route toward Denver, Colorado. We planned to use the latter city as our main supply post but had to alter our course to escape bands of hostile Indians. Thus it took us one and one half months to reach our destination and our supply was running low.

Leaving Denver, we traveled north for Cheyenne, Wyoming, and without stopping, proceeded to Red Lodge, Montana. Near Red Lodge we experienced our first difficulty upon meeting a band of hostile Blackfeet Indians*, supposedly on their way to join in the battle of the Little Big Horn. Brown discovered the Indians while spying around with his field glasses during the morning. By the time we broke camp the Indians were well upon us, and a running fight ensued which lasted until sunset, when we arrived at Red Lodge which consisted of a trading post, a few cabins, and tents. After taking on necessary supplies such as flour, pepper, and salt, our previous course was resumed toward what is now called Glacier Park.

Our party forded the river between Upper and Lower St. Mary Lakes which was very high and swift at that time. There was an abundance of fish in these lakes. An Indian camp was located on the north side of the lower end of the upper lake. The inhabitants included only old bucks, squaws, and children, as the young braves had gone to the Little Big Horn**. The first night after crossing St. Mary River, we camped on the lake shore five miles above the outlet. A trapper's cabin consisting of two crude but comfortable rooms stood fifty yards from the lake shore.

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THE CRAZY GRAY HORSE

E. T. Scoyen, Superintendent

Two years ago while examining exhibits at the annual Blackfeet Indian fair at Fort Browning, Montana, I noticed the outline of a figure of a horse cut from a thin board, no doubt the side of an apple box. After the artist had completed his whittling he had painted the figure a deep gray. As I was about to pass the exhibit with no more than a casual glance, a venerable Indian, Chief No Coat, walked up to my side and started to talk to me. As I could not understand his language Dick Sanderville took over the job as interpreter.

"Do you know anything about that horse?", I was asked.

Of course I did not, as it appeared that some school boy had made it as part of his school work. The Judge then told me the story which, as nearly as I can remember it, is as follows:

Sixty years ago there was a very famous horse among the Blackfeet known as the Crazy Gray Horse. Whenever a battle started within the range of his sight, hearing, or smell he promptly headed for the scene. His charges were always straight to the middle of the fight. No warrior was ever able to hold him back. As the judge remarked with a twinkle in his eye, "Many warriors became famous for their daring in battle as a result of riding the Crazy Gray Horse, but that didn't mean much as they had to go where the horse did whether they wanted to or not".

In three years the horse was in many fights mostly with the Sioux. During this time warriors riding him were able to capture 92 enemy guns, a tremendous achievement, for we must remember that even in defeat Indians were especially careful to retrieve all of their guns. It became that the enemy fled whenever they saw the gray horse headed in their direction, for they believed him possessed of an evil spirit.

About 1857 a band of seven Blackfeet were hunting in the Sweet Grass Hills far to the east of Glacier Park. Altho they were in enemy country and were armed only with bows, a few arrows, and knives, they felt no fear, for their great warrior horse was with them. The Sioux had been waiting for such an opportunity; the little Blackfeet band was attacked by one thousand hostile warriors. Nevertheless, the seven were able to stand off the overwhelming odds for the entire day, so potent was the medicine of the Crazy Gray Horse. But in the end they were all overpowered and killed. The horse met the fate of a great warrior and died on the field of battle.

For many years thereafter there was an organization among the Blackfeet known as the Crazy Gray Horse Society. Its membership was limited to men of outstanding courage in the tribe; actually it was what we might call an honor society. It no longer exists.

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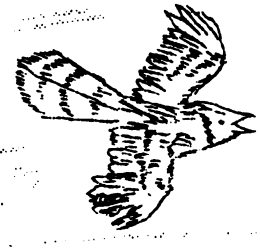

GLACIAL DRIFT

Volume VIII April, 1935 Number 2

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Eivind T. Scoyen, Park Superintendent Dr. G. C. Ruhle, Editor

"EVERY YEAR IS A NATIONAL PARKS' YEAR" (F. D. Roosevelt)

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SILVER ANNIVERSARY

On May 11, Glacier National Park celebrates the silver anniversary of its creation. In 1910, President Taft signed the bill which links this great Northland realm of mountains, glaciers, lakes, and waterfalls with Yellowstone, Yosemite, and Mount Rainier, a befitting jewel of rare beauty in the diadem of National Parks which are the crowning glory of the United States of America. This issue of GLACIAL DRIFT is dedicated as the silver anniversary number.

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The Logan Pass Indian Ceremony (Continued from page 25) - they smoked and laughed in small groups, still each with his own people, or tried out their horses on the flats. Youths, changed thru contact with white schools, did not feel the tribal isolation of their parents; they intermingled for dashes, mock football scrimmages, or playing catch.

The great ceremony was preceded by a historical and explanatory prologue by the naturalist. Representatives of the three tribes, Two-Guns-White-Calf of the Blackfeet, Bear-Track of the Flatheads, and Loose-Moccasin-Grizzly-Bear of the Kootenais introduced themselves and their people in sign language which was interpreted to the assembled multitude.

Bedizened with fluttering feathers and bedaubed with paint, a mounted Blackfeet war party, with scouts in advance, approached the summit from the east and sighted a party of Flatheads and Kootenais in the west. The scouts advanced alone and placed on top of the Pass a bent stick decorated with eagle feathers, horse hair and tobacco to signify that the Blackfeet desired peace, that they wished to smoke the pipe together, and to exchange gifts and horses. Were the stick straight, pointed, and undecorated, war would be signified. Upon the retreat of the scouts, Flathead and Kootenai scouts approached to examine it and get its message, which they carried to their chieftains. The two parties slowly advanced towards each other, chanting their war songs which were echoed by squaws gathered on the adjacent slopes to watch the proceedings. The leading chiefs hailed each other and conversed together in signs; the braves dismounted and, kneeling, faced each other in two parallel lines and smoked the sacred pipe, passing it from right to left with great solemnity. An exchange of gifts and mounts followed. As a symbol that the three tribes were now at peace forever, and that a new route of communication had been opened between the lands of their ancestors, the Blackfeet passed over the highway into the territory of their former enemies; the Flatheads and Kootenais advanced into the land of the Blackfeet.

Upon returning to the Pass, the tribes held a great feast of celebration, beginning with the Grass Dance. The zest with which they threw themselves into these was well exemplified by one Flathead brave, stripped naked except for a cincture about his loins, a leather vest, and circular fan of Chinese pheasant feathers dangling in the rear from his belt. His bare skin was painted bright yellow and streaked with red. He stamped and caricoled, whooped and simulated all the postures of actual fight with such frenzy and vigor that he would cast himself exhausted on the circle of benches that had been put around the dancing site to keep back the whites. Within a few minutes he would pull himself together again, tense and quivering with emotion, and would dash back among the weirdly gliding forms long before breath was again coming evenly and smoothly.

In council among themselves that evening, the three tribes decided that they had had a great and profitable time. They desired to meet on peaceful terms again next year with all of their former adversaries: Nez Perces, Crows, Sioux, Assiniboines, Gros Ventres, Snakes, Stonies, Crees, Sarcees, Kainah, Siksikas, Arapahoes, and Cheyennes. They would hold a great tribunal and the park naturalist should again be in charge of their ceremonies.

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NOTES FROM GLACIER NATIONAL PARK

SEPTEMBER- 1933

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Few Waterfowl - Harry Doust, ranger of St. Mary District, was recently transferred to his former station at Kishenehn, from which he had been absent for two years. One of his first comments upon returning concerns a subject which has alarmed true bird conservators for the past few years, the growing scarcity of waterfowl all over the country. Harry writes: "The absence of bird-life along the river (North Fork of the Flathead) is very noticeable. Four or five years ago there were numerous ducks and loons, and occasional honkers. At times, Kintla Lake would be dotted with hundreds of birds. So far this fall (December 1), I have seen only three loon and nine mallards in the two months I have been here."

Flight - The duck and goose flight over Waterton Valley was strung out over an unusually long period this year. During the last week of November, about three hundred golden-eyes, harlequins, and teal floated about on the lake for two days. Several other varieties were present in scattered numbers. Only one flock of geese was seen on the lake this past month (November).
- L. O. Hanson, Park Ranger

Fish Food - On November 15, I caught eight bull trout (Dolly Vardon) in Logging Lake, whose weights varied between one and one-half to eight pounds. The stomachs of six of these contained whitefish, that of the largest holding a full-grown victim. I noticed swarms of trout fingerlings and sucker minnows in the spot where I caught these fish, so it may be inferred that thru preference or otherwise, whitefish are the principal food of bull trout at this season. The stomachs of two cutthroat trout caught at the same place contained snails and rock worms. - Elmer Fladmark, Park Ranger

Road Closed - The Park Service has learned that it takes more than a prohibitory sign and a barrier to keep people from using a road. Each autumn when snow blocks passage over Logan Pass, a heavy bar is placed across the bridge over Avalanche Creek to protect motorists from going further where danger of rock slides and deep snow is imminent. Despite this, passage is often forced, and many venture beyond often without chains and clothing adequate for the severe wintry conditions of higher altitudes, only to appeal for help to the paternalistic ranger or other park service man who happens to be in the vicinity. Such adventurers would spare themselves and others much misery and trouble, if they would heed the wisdom of the park administrators when they caution, "Road closed."

Banner Year - Glacier National Park signalized 1934 as National Parks Year by overwhelming completely all previous travel figures. 116,965 people entered the park gates, an increase of 53 per cent over 1935, the previous record year, and an increase of 120 per cent over 1932. Meanwhile, 136,000 listened to the lectures of ranger naturalists, or took trips afield with them, or otherwise utilized the personal service offered by them.

Record Cedars - The western red cedar, juniperus scopulorum, is a small tree or shrub found at lowest elevations in the park. Ranger Andrew Fleutsch, on patrol, observed large individuals growing in his Kishenehn District. The circumference of the trunk of the largest living specimen measured forty two inches at the base, thirty eight inches [illegible]

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UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF NATIONAL PARKS, BUILDINGS, AND RESERVATIONS
GLACIER NATIONAL PARK

GLACIAL DRIFT

Volume VI September, 1933 Number 5

A popular pamphlet edited by the Park Naturalist and distributed gratis from time to time by the Educational Department of Glacier National Park to persons and organizations interested in the Park and its natural history.

Eivind T. Scoyen, Park Superintendent Dr. G. C. Ruhle, Editor

"Nature is the Art of God"

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The travel figures in Glacier National Park during the 1933 season were the largest in the history of the Park. The total number of people entering the park this year was 76,615. This figure we found to be 2,839 more than the total for the year 1930, which was the peak year for the Park, or an increase of 3.8%. The total number of cars amounted to 20,483, which was 2,165 over 1930 or 11.9% increase. This year's figures were 23,413 over last year for the number of people entering, or an increase of 44%. This year's automobile figures were 6,333 over last year, or an increase of 44.5%.

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GLACIAL DRIFT

EMPTY SPADES

W. Stephen Thomas, Ranger Naturalist

Impressed with the white glory of Grinnell Glacier and awed by the rock walls of Appekunny, Altyn, Wilbur, and Wynn, visitors driving into Many Glacier may not at once sense that this recreational center was thirty-five years ago the scene of great commercial activity - a mining rush. Near the close of the last century a stream of prospectors and adventurers lured more by the rumors of vast deposits of copper, oil, and oil shale, rather than by the grandeur of the mountain scenery, poured into this valley.

Even as early as the eighties of the last century, when scientific scouts of the calibre of George Bird Grinnell and Raphael Pumpelly were filling note books with geographic data and before J. W. Stevens had discovered Marias Pass, a few prospectors were unsuccessfully panning for gold along Swiftcurrent Creek. But when others found traces of copper at the head of Quartz and Mineral Creeks, over-eager speculators wanted the territory east of the divide, then a part of the Blackfeet Reservation, to be opened for legitimate occupation. The fact that the Swiftcurrent and Sherburne Valleys were then closed to settlement, however, did not hold back many of the hardy western type. Quite appropriately their contemporaries called these miners "sooners", because they came before the rush.

Little has been written of the dramatic events transpiring during the mining days of Many Glacier. Few are the original settlers who can tell tales of the time when Iceberg Lake could be had for the taking or when one could build a cabin and locate a claim at Swiftcurrent Falls. One of these few is Frank M. Stevenson, perhaps the first to take up residence in the section. His original cabin stood where a single lodgepole pine droops over the highway, west of Sherburne Lake.

The past is far from an apparition when we see it thru the eyes of Mr. Stevenson, who in an hour of conversation can paint the opening of Swiftcurrent valley as a mineral strip.

"I guided the company of soldiers sent to open the area and showed them to the line," narrated Mr. Stevenson. "They were camped at the ranch of "Butch" Henkel, near the present town of Babb. The mountain above Many Glacier Hotel is named for Henkel. The cavalry detachment from Fort Assiniboine had come in to take out the sooners and control the opening of the territory. There were quite a few of these sooners. I took the soldiers in to the boundary on April 15, 1898. There was a lot of snow on the ground, and all of them couldn't get their horses up the hill below the present site of Sherburne Dam.

"At noon the soldiers fired a volley from their rifles, and that was the signal for the rush to start. Just one or two of the cavalry, the lieutenant, and myself were able to get in. Very few of the prospectors got to the line that day, since many streams were greatly swollen with water.

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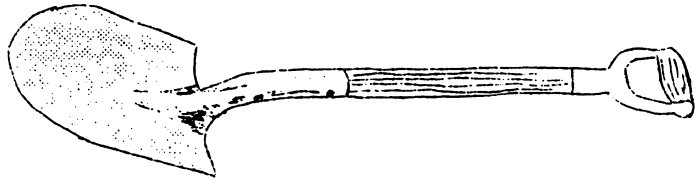
Horace Clark, a half-breed, and myself were the first two that got to the the falls of the Swiftcurrent. I located a mill site and water right. Later I had five locations, some that yielded oil on what is now Park property.

It was not long before the newcomers had sunk tunnels into the shale and limestone. Then their spades were not empty, as today. Altho they found traces of mineral in the form of copper pyrite and some copper ore with cobalt, the ores did not exist in commercial quantities. Today, many a forgotten shaft shows its dark maw in the steep walls of Grinnell Peak, in the slope of Appekunny, and at Ptarmigan and Iceberg Lakes. Attestation of an intense period of mining activity, these abandoned claims are the sole traces of an army of settlers. Their ghost town of Altyn, once having a population of over five hundred, must have been a bustling center on Altyn flats. Now but the faintest vestige of a few cabin foundations remain of this community which once boasted a post office, store, several saloons and dance halls, and even a hotel. The waters of Sherburne Lake, dammed to a higher level, now roll over a portion of the town, whose inhabitants were forced to pull up stakes when Glacier Park was created in 1910.

Mr. Stevenson reminisced further: "The little Ptarmigan Lake I really named, because when I sat down one day to get notes on the boundaries of my prospect some ptarmigan walked across my feet, they were so tame. In 1906 I built a cabin there at the falls below the lake so that I could have a place to live in when I was working on the claim. I ran a tunnel in thirty-five feet on the south side of the lake. I built a cabin at Iceberg Lake in 1899 and did more prospecting there. Near that patch of snow on the north side of Iceberg I had what I called my White Elephant Lead."

Besides these and the small shafts sunk here and there in other valleys, the Cracker Jack mine with its hulk of rotting machinery and dilapidated buildings at Cracker Lake is another testimony of the money and labor expended in a fruitless search for minerals. Here Jim Harris staked his claim; his fellow miners nick-named him "Smooth Bore" because of his facility in conversation. Today the mill is the resort of saddle horse parties from the Many Glacier Hotel, hikers, and the marmots that exact toll from the lunches and the sentiments of the former.



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AN ASCENT OF MT. WILBUR

- W. Stephen Thomas, Ranger Naturalist

For three summers the towering rock walls of Mt. Wilbur have boomed over my quarters in the naturalist's tent at the Many Glacier campground. For three summers those precipitous cliffs, golden when touched by the rays of the morning sun, have dared me to climb them and to reach that towering summit. On August 20 of this year, led by "Chuck" Ziering, already the veteran of three successful and two unsuccessful ascents, and in the company of Jim Kinney, of Hawaii, and Pat Nelson, of Minnesota, I looked upon the familiar walls with a new interest for we aimed to reach the top.

About a mile west of Red Rock Falls we left the Swiftcurrent Pass trail and proceeded up a dry creek bed. Fifteen hundred feet of tumbled slide rock and shale brot us to the dark band of diorite so familiar on the mountains of Glacier Park; and there the stiff scaling began.

One chimney led us fifty feet nearer the top. Following some straight climbing, we were aided by another chimney, but in this one, toes and fingers dug tightly but thinly into the rock were the sole supports. High on the southwest shoulder we looked down on Iceberg Lake, a speckled spot of blue directly below. By a third chimney we reached the northwest shoulder, and there found it necessary to drop two hundred feet into a saddle before we could gain the true summit. The first five hundred feet on the main dome were easy climbing with fine, broken limestone underfoot. We made the cairn at 9293 feet above sea level by 10:45 A.M.

Two containers found among the boulders held the records of previous climbers. One, a match safe, included the earliest listed names: G. M. Kilbourne, 1927, headed the list as Norman Clyde did not sign for his 1924 ascent. Kilbourne and Seethaler have made the climb twice; Warner, thrice; and Ziering, four times.

On the summit I collected red and yellow crustose lichens, and near the top, polemonium, sedum, and saxifraga. (For an account of early climbs, see GLACIAL DRIFT, IV, 62 and 72, 1931.)

Clouds enveloped the mountain and marred our vision during the descent. By the time we reached the last cliff, hail began to fall and continued for an hour. These poor weather conditions made the footing on the rock faces exceedingly precarious and walking in the shale unpleasant and slippery. At 4:00 P.M. we reached the camp grounds, soaked and chilled to the bone but far from dampened in spirits.

Botanists seem to have trouble deciding on the generic name of Devil's Club, as it goes by Fatsia, Echinopanax, Oplopanax, and Acanopanax. All agree on the specific "horridum", however.

- Dr. W. T. McLaughlin, Ranger Naturalis

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SECOND ASCENT OF ST NICHOLAS

M. N. D'Evelyn, Ranger Naturalist

Conquering first the psychological fears of Glacier Park's most formidable appearing peak among several hundred stupendous mountains and secondly the more real challenge of a sheer cliff over a thousand feet high, Dr. R. T. Young and son of Missoula late in August made the second ascent of Mt. St. Nicholas in history. "Saint Nick", as the peak is informally called by all familiar with the stark steepness of its outline, appears far beyond the reach of any mortal. It is a craggy spire topping 9380 feet above sea level, which stands between Park and Coal Creeks in the Middle Fork country. It is a well known landmark to travellers on the Great Northern Railway or on the Theodore Roosevelt Highway.

Alpinists by the score have been lured by the precipitous contour of St. Nicholas, but only one, Conrad Wellen of Havre, had succeeded in reaching the summit (See NATURE NOTES III, 86). Mr. Wellen accomplished the climb in 1926 after several futile attempts. A youthful companion accompanied him about half way.

Dr. Young is professor of biology at the State University of Montana and a former Glacier Park ranger naturalist. The two scaled 3500 feet of underbrush, shale slopes, and naked cliffs in four hours and forty minutes, reaching the top at two o'clock in the afternoon. The route lay by way of Rotunda Cirque on the northeast slope, and the climb termed comparatively easy once the half-way mark was passed. One solid rock wall which presented no hand or foot holds momentarily stumped the pair of ambitious climbers. It was surmounted by one first climbing onto the other's shoulders and then pulling up his partner.

THE PARK NATURALIST STAFF

After the rapid growth made by the ranger naturalist staff in Glacier National Park since 1929, a drastic retrenchment was necessary because of shrunken budgets and an expected travel decrease. Only six of last year's naturalists returned. To these, a seventh was added as special assistant to the park naturalist. Returning this year were Harold E. Bailey of the University of California, J. LeRoy Arnold, graduate of the University of Pennsylvania and now teaching in Southern California, John T. Emlen who receives his doctorate from Cornell University this year, Dr. Willard T. McLaughlin of the staff of Northwestern University, W. Stephen Thomas of Harvard and Louis Wessel of the University of Oregon. The new staff member was Morton N. D'Evelyn, now of Stanford University, who visited the Park with an Eagle Scout Expedition in 1931 and who spent the summer of 1932 on a biological expedition to Costa Rica for Carleton College and the University of California. Like unexpected increase in the Park, the naturalist division served more than ever before: 105,000 attending its services.

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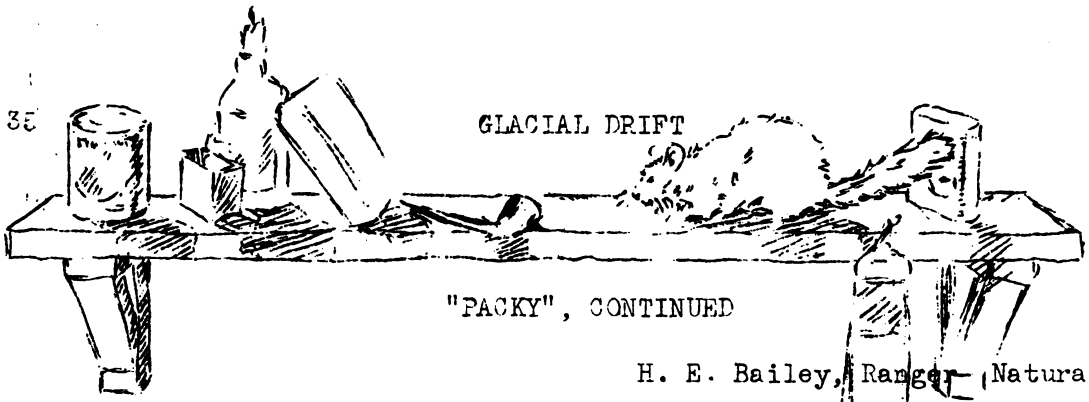

"PACKY", CONTINUED

H. E. Bailey, Ranger-Naturalist

With the single exception of the bear, the pack rat appears perhaps in more stories than any other Park animal. A yarn that never fails to bring a roar at camp fire entertainments illustrates the pack rat's peculiar habit of replacing one object with another, which gives the animal another common name, trade rat. It concerns a pair of newlyweds who tried their hand at making biscuits for the first time. Upon leaving the dining table they returned to find that stones had mysteriously taken the place of the biscuits. Next morning the stones had been reclaimed -- and the biscuits returned.

This inveterate habit is not nearly so humorous when it strikes closer home. Possessing a kindly nature and at the same time having become quite attached to our pet exhibit pack rat, we unadvisadly freed it at the end of last season. Packy promptly took quarters under the museum, and during the long winter made away with every shiny object possible, including some three dozen cut flower label holders. Needless to say, the exhibit rat was painlessly etherized at the end of the past season.

Our caged rat draws a tremendous amount of interest. When alarmed it jumps with lightning speed into the little stone shelter provided for it. But being of a curious nature, its quizzical face is soon poking out thru the opening with an expression that reminds one of a pup who has chewed a shoe and senses his guilt. Whenever excited the pack rat makes a thumping or drumming sound by flatly striking the soles of his hind feet on the bottom of the cage.

There are two pack rat dens in the Many Glacier district, one in the crevices of a limestone ledge on the north side of Swiftcurrent Falls, the other in a small cliff on the west shore of Josephine Lake. Their presence is detected by white calcareous deposits excreted with urine and built up as a white stoney crust often over a millimeter thick. These excreta, mistaken for geological, i.e. inorganic deposits, have often caused much speculation and inquiry among observers who could not fathom their origin.

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Swimming Grizzly - On an August field trip at Many Glacier, the naturalist told his party about different animals that can be seen at the hotel and camp grounds, and narrated noteworthy incidents witnessed by guests in times past. Included were several yarns about bears in Swiftcurrent Lake, especially that of the black bear that gayly disported in the water at the time of a visit by the Secretary of the Interior, in 1929, just when parkmen prayed for happy display and rare occurrence. At dinnertime most of the informed party members were happily surprised by a comparable performance. A huge grizzly made appearance on the west shore of the lake at the Narrows. Across, a fresh dumping of choice hotel garbage beckoned. Without delay, he plumped his huge bulk into the cold water and paddled the several hundred yards to the opposite shore, much to the glee of several scores of spectators on the hotel veranda.

Trained Bear - Many a bear is berated around camp and cabin in the National Parks for raiding garbage buckets and scattering the contents untidily over the ground. The bear that proved the exception appeared at the Granite Park Chalet early in August. He seized the gunny sack full of swill standing outside the kitchen door, dragged it neatly to the garbage dump, there thoroly rumaged thru the contents for tidbits.

Adhesive Nonchalance - Marvelous tales have been told about the climbing prowess of the mountain goat, many of which tax to the utmost the credulity of the listener. On a trip over Lincoln Pass in early September the park naturalist and an assistant watched a solitary billy at close range, as he moved over the face of a particularly bad wall, a part of Gunsight Mountain. Coming to a sheer drop, the goat, scarcely hesitating a moment, dropped his front legs over the edge, thumped his chest against the rocks, leaped, and landed fifteen feet lower on a pinnacle several feet high that had barely enuf apical surface to offer footing to his four legs, even tho placed close together. From a distance the goat appeared drawn to the sharp point like iron to a magnet. There he stuck, for some fifteen seconds, nonchalantly poised like some animal performer on a small ball in a circus arena, until he bounded to the firmer, broader terrain below. The daring leap was made on the rim of the abyss overhanging Lincoln Lake, whose cobalt waters sparkle 3500 feet below.

Sperry Goats - For years goats have been coming almost nightly to visit Sperry Chalets and delight guests by awakening them with the prancing of sharp hoofs on the dormitory veranda. The record number of goats visiting at one time at the Chalets was set one night last June when fifty-seven by actual count disported themselves in a great reunion. (See NATURE NOTES II, 30)

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Tree-nester - Many a naturalist might spend weary and fruitless days searching for the nest of a tree-nesting duck. Not so Ranger Naturalist John T. Emlen, of Lake McDonald, ornithologist from Cornell University, for whose pleasure and study a golden-eye duck built a home in a cottonwood fronting his lakeside tent.

Logan Pass Ptarmigan - Visitors to Logan Pass have been delighted all summer by being able to observe at close range several broods of ptarmigan living there. Broods numbered from four to six chicks. As the birds were very tame, they received much more handling than was perhaps good for them - the number of young appearing halved by the end of August. As if for variation a mother Richardson grouse also had her family there, far above their natural haunts in the forest zones.

White-winged Crossbills - About crossbills, aside from the remarkably malformed mandibles, noteworthy and interesting is the irregularity which characterizes their occurrence in a region, and the confiding tameness of individuals. Glacier Park was visited during 1933 by great numbers; flocks were reported from all corners of the Park. Strangely enuf, most of the newcomers were white-winged, whereas in normal years, the American crossbill has been the commoner species.

Twining Larch - Rarely is a plant capable of assuming more than one habit of growth; still more rarely does an individual of one habit simulate another foreign to its nature. Freak habits are the results of constant distortions, disease, or other unnatural restraints. On the old Sperry trail scarcely a mile above Lake McDonald a larch has affected the manner of a twining vine, has wrapped itself thru 540 degrees of arc about a supporting tre of its own kind, the latter growing straight and true. The two individuals have fused thruout most of their boles, but the higher third of either grows upright, so that, at a distance, the pair appear as a double-topped individual. The supporting larch is a foot in diameter at the base; the twining climber, only slightly less robust. The probable scientific explanation is that the second larch, growing contiguous to its more robust neighbor, was bent and constantly rubbed against the latter by prevailing winds until a natural graft was started. This process continued thruout most of the trees' growth.

Wilbur's Challenge Accepted - Frowning over Swiftcurrent's alluring center, the majesty which is Mt. Wilbur dares many a mountain climber to pit his scaling prowess against its stupendous rock walls; but few accept its challenge. Among the twenty-seven names signifying successful climbers in the log on the summit, that of Charles ("Chuck") Ziering, Many Glacier savage, appears four times, all recorded during the past sum

Racing Goat - Running speeds of various wild animals have been measured from time to time by various means (NATURE NOTES III, 26). Ranger Natura ist John T. Emlen raced his car with a mountain goat for one hundred yard along the Going-to-the-Sun Highway above the west side switchback. His result: the goat moved at nineteen miles per hour.

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The One that Almost Got Away - Evidently even the osprey, skillful fisher that he is, sometimes over-estimates his ability. As I was coming down Logging Lake, I saw one of these fishing hawks swoop into the water. The great thrashing and splashing that followed disclosed the fact that the fish was sorely taxing the strength of the mighty flyer's wings. Several times the osprey was dragged under before rising triumphantly with its catch, a large trout, and flapping heavily-laden to shore. (Nature Notes III, 310) - Elmer Fladmark, Park Ranger

Selfish - DO NOT PICK THE WILD FLOWERS; LET OTHERS ENJOY THEM ALSO read the signs at all tourist centers. Tho regulations forbid and naturalists explain, unthinking or selfish individuals are constantly depriving others of rightful pleasure by picking certain blossoms. On a field trip one morning, the park naturalist was chagrinned to discover the only convenient bear grass flower not only plucked, but cast aside, withered, in the dust of the trail a hundred yards further on. Dr. McLaughlin, naturalist at Sun Camp, writes in the log for his station: "In the afternoon a group of three girls came into the lobby, one with a couple of stalks of hollyhock. I didn't have to ask where she got it -- I knew. It was the only clump along the trail, and subsequent examination proved the premonition correct."

Oiled Trails - Last year, for the first time in history, leading trails in the Park were oiled for several miles from tourist centers as a dust palliative measure. Not until this year was the great good from this move apparent. Principally, the air has remained dust-free and pure for horseback parties which formerly progressed the forest paths enveloped in a choking cloud of dust that dispersed all possibility of appreciation of scenic beauty, floral wealth, faunal interest, and exuberant climate. In addition, the oiling has created additional pleasure for the hiker and economy for the Park budget, which more than offsets its expense. No longer do the trees and shrubs stand drably laden with dust along Glacier's trails. No longer is the purity of the faces of the wild flowers sullied with grime and dirt. Leaf, blade, and bloom appear bright as if after a cleansing rainstorm. Another advantage, oiling has given the trails a coating almost impervious towater, so that run-off after a summer shower is rapid and complete. Quagmires thru which horse and hiker formerly had to wallow are drained quickly and thoroly. Lastly, erosion has been reduced to insignificance.

The crop of young ruffed grouse is simply enormous. These grouse are uncommon in the upper valleys of the Two Medicime District where visitors travel, but are found in great numbers along the boundary trails. - Clyde C. Fauley, Park Ranger

Upon being captured by a C.C.C. boy, a cony reacted to a few minutes of petting by becoming quiet and tame, sitting in our hands without the least bit of fear. - Thos. E. Whitcraft, Assistant Chief Ranger

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THE GREAT POW-WOW*

by

SOURDOUGH SAM

The other day, to be exact July 15th, 1933, with a bunch of Indians whose teepees are pitched where the waters of Libby and Callahan Creeks mingle with those of the Great River of the Flat Bow, now called the Kootenai, I climbed through Bill Logan's Pass, and after much back firing and puffing and boiling over of radiators and exhaustion of vacuum tanks, reached the Summit of the Great Divide that separates the Bay of Hudson and the two great salt water lakes that lave the shores of the continent. Here we found what the big medicine men called a natural amphi-theatre, if you know what I mean, and here were assembled the big chiefs and braves and squaws from the Salish and the Blackfeet; from the prize fight metropolis where the big railroad divides--part of it going east and west and part of it going south; from the wigwams on the bank of the Cut Bank and from the sage brush metropolis where the waters of the big river tumble over the high rocks and the juice of the dynamo is distributed to many camps and villages in the great State of Montana. Also, there were big chiefs and braves from the village of Last Chance, which Marcus Daley and his cohorts christened the Athens of Montana, and the blankets of these chiefs and braves and their squaws and papooses were of many colors, contrasting with the buckskin colored blankets worn by Chief Scoyen and his lieutenants and the big chiefs of the mighty "Walk-a-Heap" from the Fort on the banks of the Bitterroot near Hellgate, a scene of gorgeous and resplendent coloring was presented. Yea, and there was also a big chief from the land of heap snow to the north, and many there were from the big villages east and west of the borders of Montana. These pilgrims sat upon snow banks, the like of which they had never before seen, and they beheld for the first time the Indians of Montana, which must have been a treat unto their eyes. Among those who gathered there on the mountain top to lay down the law and to tell the people about the new deal were braves who had wintered in the big wigwams at Washington and Helena, and eloquent and highly edifying was the flow of oratory, and the people went about among themselves talking, one to the other about the prowess of the engineers and contractors who had made it possible for them to bring their eight, twelve, and sixteen cylinder travois and red river carts up to the very top of the backbone of the great continent of North America.

After the big pow-wow was over, then it was that the great pacificator and peace maker, Doc Ruhle, brought the warring tribes of the Salish and Kootenais, the Blackfeet and Piegans together and there in that solemn environment of beetling crags, drifted snow, flower and pine bedecked and ornamented canyons, the tribes buried the tomahawk forever.

*The impressions of Sidney M. Logan, pioneer of the Glacier Park country and brother of Major Logan, Glacier's first superintendent, for whom Logan Pass is named.

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As a boy I lived among the Blackfeet. For forty years I have lived where the Salish and the Kootenais pitch their teepees on the shores of the great inland fresh water sea, where "a billion dew-drops are garnered in a bowl", as my good friend Charlie Towne has so eloquently and poetically described the Lake of Salish. A wave of sadness came over me as I saw the proud Blackfeet, all mounted on horses, their faces towards the setting sun riding solemnly and with great dignity to the crest of the Pass, there to plant in the ground a blunt stick, bedecked with eagle feathers, and then to ride solemnly back to take up a position behind a screen of stunted and windswept evergreens. Then the scouts of the Salish and the Kootenai, their faces toward the rising sun, approached the token of amity and good will, slowly circling around it, eying it with suspicion and wary of the Greeks bearing gifts but finally removing the token and carrying it back to the chiefs of their party. Then the approach of the two parties, the hand shaking, the big pow-wow, the peace pipe, the dance and the tomahawk was buried forever. Thereby hangs a tale more or less veracious. I have said that the sight saddened me--it did, because of the legends of the Salish. Time there was when the Blackfeet roamed the prairies of what is now Northern Montana and the great expanses of Western Canada, afoot, armed only with bows and arrows with flint heads, and the Salish lived on the shores of the great lake and river to the West and the Kootenai on the great Flat Bow to the North. While the Blackfeet were yet killing their buffalo by running them over cliffs, dispatching the mangled animals with bow and arrow, the marauding Shoshone, neighbors of the Salish and the Kootenai brought to the villages of the latter wonderful animals with flowing manes and tails to haul their travois and to supply mounts upon which they could travel for many miles each day without fatigue. These were filched from the "men who pound on iron" many moons travel to the East and to the South, yes, even to the great river which cuts its path a mile deep in the painted rocks of the desert. One day a party of Blackfeet wound their way up through one of the canyons near unto the scene of the holiday festivities of July 15th, and coming to the Lake of Salish they saw the braves and squaws and papooses of that people disporting themselves in the waters of the Lake and riding about on the strange animals with flowing manes and tails, and their hearts were filled with envy and covetousness. They returned to the villages of their people. There they removed the hair from the hides of many buffalos and they cut the raw hides into strips and they braided the strips into long ropes sometimes called lariats and riatas and lass ropes, depending upon the tribes of white and red Indians where these contraptions were want to be used. They sent for Will Rogers, Charlie Russell, Bill Davis and other specimens of the genus that made their living by punching the cow and riding the bronc. They knelt at the feet of these white Indians and learned to throw the noose of their raw hide ropes with dexterity and efficiency, and when they had learned all that the white Indian could show them, they again crossed over the mountain with the ropes concealed under their buffalo robes. They approached the camp of the Salish, and they held their right hands up with the palms forward, in token of peace and they were invited into the camp of the Salish and there the fires were poked up and fed with the resinous wood of pine and larch and the sweet smelling cotton wood and willow and alder. Many dogs were sacrificed and there was great feasting like unto the

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feasting on the top of the mountain on July 15th, (with the difference that the Salish removed the skins of the dogs before putting the meat into the pot, but big Chief Scoyen made his guests eat the hot dogs with the skin still on,) and there was much pow-wowing and dancing and smoking of the peace pipe, and when the day was over and the moon came over the mountain, the Blackfeet looked at the moon over their right shoulders but the Salish were careless and thoughtless and looked at the moon over their left shoulders. When the moon went behind a mountain, the Salish laid down by their camp fires, wrapped themselves in their buffalo robes and drifted into happy, careless sleep for they felt that they were safe because they had been told by a big chief of the Blackfeet that they were perfectly safe, that there wasn't an oil promoter or other white man within a thousand miles of them. But the Blackfeet were restless and bothered with much insomnia and when they took themselves unto their couches beside the smouldering camp fires, the raw hide ropes concealed by their buffalo robes pressed against their bodies and reminded them of the purpose of the meeting. When the moon was dark they quietly rose and they went back towards the rising sun to the teepees of their people, but they didn't go afoot. That is the reason, my children, why on July 15th, 1933, at Doc Ruhle's big pow-wow the Blackfeet rode proudly towards the setting sun, mounted on horses, and the Salish and Kootenais walked lamely and sore footedly towards the rising sun, and that is why, my children, that the Blackfeet danced with more abandon, and sang with more volume, if not with more melody than did the Kootenais and the Salish. From the time of which I speak, the children of the Kootenai and the Salish have been the forgotten men, and the children of the Blackfeet, the capitalists. That is why the face of one of their great chiefs appears on the buffalo nickel, and why they look forward with pleasant anticipation to the day when more oil wells will come in on their reservation and the face of the chief will appear on the silver dollar; yea, even on the twenty dollar gold piece of present weight and fineness. That is why, when the Hudson Bay and Northwest Company traders came among them, they found them opulent and full of pep and arrogant and proud. They demanded the thunder and lightning from the traders so that they might go against their enemies and with the bright tubes of the white metal that spoke with thunder and lightning and drive them from the disputed hunting grounds. That is why, with the weapons of the traders of the Hudsons Bay and Northwest Company, they went on down to Snake Creek close by the village of Chinook which is pitched on the bank of the river, the waters of which run white as milk, to the eastward of the great sage brush metropolis of the great falls of the Missouri, and there they found the proud and hitherto triumphant Shoshone and they approached them and they discharged the powder and lead from the tubes of iron which they held in their hands and the Shoshone, or as they are sometimes called, the Snakes, thought that the Great Spirit had given their enemies the thunder and lightning and they said unto themselves "skidoo for us" and they did Skidoo; And they went back from the land

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cycle nor a period of early warm weather can explain its intermittent seasons of splendor; however, the weather has apparently suited other Park flowers well. The drier meadows are colored by great clumps of showy gaillardia with its orange and red heads reaching almost unprecedented size, and the hillside near St. Marys and elsewhere are a sheet of blue with the bush lupine (Lupinus tenellus).

As we drive along, lost in admiration of this beautiful lupine, our attention is suddenly caught by a strange phenomenon. In the midst of the deep lavender plants is one with pink flowers, fresh and lovely and so strikingly different that no one could fail to observe it. A closer examination reveals that aside from the color distinction there is a slight difference in the shape of the leaflets. Where did this plant come from? It appears to be quite alone. It doesn't seem likely that a difference in soil could explain the problem, as it is within a few feet of the purple plants and the soil appears the same thruout. Is this a mutant, the result of that strange prank of nature whereby occasionally an individual suddenly springs into being quite unlike its parents in some respects. Such mutation has been just the manner, many botanists believe, in which some new species of plants arise. As we see about us the confusing array of flowers and realize that there are nearly 900 species in the Park and that this is but a handful of the 125,000 species that clothe the surface of the earth, we are impressed anew with the complexity of their ancient lineage.

*****

PLANT MIGRATION

W. T. McLaughlin,
Ranger Naturalist

One of the strange and interesting plants of the park is the devil's club, Echinopanax, with its large maple-like leaves and spine-covered branches. It prefers low moist thickets and may form a barrier painful to the trespasser. Perhaps the strangest thing about this plant is its range thruout the world. It occurs in the Pacific Northwest and east to the Rockies where it is limited, with only occasional exceptions, to the west slope; it is also found native in Japan. If we proceed eastward a thousand miles across the plains and prairies we find it in an area circumscribing Lake Superior. You may say that a bird must have carried the seed there. Altho it develops showy red berries later in the summer I have never seen a bird eat them. Moreover, the migration of most of our western birds is north and south rather than east and west.

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GLACIAL DRIFT

4

JANUARY

1934

WINTER NUMBER

NOTES FROM

GLACIER NATIONAL PARK

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UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
GLACIER NATIONAL PARK

GLACIAL DRIFT

Volume VII July, 1934 Number 4

A popular pamphlet edited by the Park Naturalist and distributed gratis from time to time by the Educational Department of Glacier National Park to persons and organizations interested in the Park and its natural history.

Eivind T. Scoyen, Park Superintendent Dr. G. C. Ruhle, Editor

"Nature is the Art of God"

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HUGH LENOX SCOTT 1853 - 1934

"Be noble, and the nobility that lies in other men,
"Sleeping, tho never dead, will rise in majesty to meet thine own."

To the park naturalist, his friend and companion on visits to Northwest Indian tribes during the closing years of life, Major-General Hugh Lenox Scott quoted the above as a great guiding principle of life, the proof of which was the abundant reward of his life. It is quoted here as being exemplified in ample measure by Scott's rich and well-spent life. Firmness in the right as he saw it, honesty, consideration, bravery, all of his strongest traits can be regarded as corollary to a graceful nobility which was the man himself. Sympathy for and understanding of the position of the other man, regardless of race or religion, were his in great measure. Lying on his hospital cot in Washington last spring, he dreamed of the sunshine and open expanse of the Great Plains so dear to his heart. Out there, tom-toms beat with slow, sinister rythm and smoke rose in thin, straight columns while his erstwhile antagonists, the Indians, poured out their hearts in love and prayer for his speedy recovery. But Death claimed him for his own, and rewarded the aged warrior with the gift of eternal peace.

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UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF NATIONAL PARKS, BUILDINGS, AND RESERVATIONS
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I take the stand that to many visitors a coyote may be a far more stimulating sight than deer. How thankful I would be if all park men could finally get the view point that unmodified nature is the real goal set for wild life administration in the national parks.

Dr. H. C. Bryant, Ass't Director
Office of National Parks,
Buildings, and Reservations

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EDITORIAL PAGE

SANCTUARY

This number of GLACIAL DRIFT is devoted to the moot question regarding the relationships between predatory animals and game animals, and some current opinions on the effect of control of the former upon the management of the latter. Principally it deals with coyotes and deer which furnish Glacier Park with its most debatable topic. There are presented views of different individuals, especially of those who try to examine the situation without bias, or who have had ample opportunities to make observations in the field. If it appears that the greater volume of facts presented here inclines favorably towards the predator, it must be recalled that prejudice and lack of intelligent study has heretofore always weighed against the predator.

Before considering the question it is well to fix in mind that the field of study embraces only the National Parks, in which an attempt is made to present a picture of the region in as near its original state as possible. In such the predator is as much a part of the picture as the game animal. It must always be remembered game alone must not be regarded as the wild life of a Park area. It must also be remembered that it is impossible to fix the population of any one species at a definite number, and that removal of a predatory species may react unfavorably towards the species whose welfare is being favored.

Early in the twenties, government hunters took over a half-hundred mountain lions within the Park area. If these killed the estimated average of fifty deer per year, the annual number of deer killed by lions alone approached the estimated deer population for the Park, last estimated at 3022. There are now three lions definitely known to reside in the Park, a number insignificant to that of former years. If coyotes have increased in the Park area, this fact might well be attributed to the diminution of lions, wolves, and other predators. Meanwhile, the deer population has remained practically stationary, altho, in the opinion of a few old-timers of the region, it has degenerated in vigor, which, of course, might well be attributed to winter feeding. Deer killed by coyotes last year were estimated by the ranger force to number 267 animals.

The Park Service furnishes sanctuary for wild life persecuted in other regions, without prejudice or favor to any kind of its wards. Nothing within the power of man can restore any form of life, once it is eradicated from the earth, regardless of what importance to his destiny it is later discovered to be. The Park Service believes that education and intelligent study are the only tools with which enduring progress in wild life management can be made. It strives to act intelligently with an aim towards the greatest benefit to all of its wards and towards the greatest inspiration and enjoyment of park guests. In this number, facts are presented of a problem that is far from settled, farther from being completely understood. It is one of the vital questions of park administration today.

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Mascot - Less than a day after the CCC unit at Anaconda Creek moved into camp this spring the boys acquired a mascot, a spindle-legged moose calf. The youngster was found along the road during the first day and was brought into camp. Tho the officers and work foreman immediately had the baby returned to where it was found, fearing the wrath of the mother, the mascot returned the next morning and waited in front of the kitchen door. The ways of man did not satisfy the baby moose however, for in a few days it wandered off again. - Tom Mooney, Temporary Ranger

Albino Elk - On April 14 on Lee Ridge I discovered a group of seven elk, one of which appeared to be an albino. By stalking very carefully I approached within one hundred yards and saw that the animal was not pure white all over, but that the body was a dirty white color with the legs and head a little darker. It appeared to be quite young; two or three years old, I should judge. - Elmer Fladmark, Park Ranger

Bear Prank - One balmy spring day I was wondering as I hiked down the Ole Creek trail whether I would meet again the mother bear with her two cubs that I had seen farther up the creek. All at once a voice, shouting my name, awakened me from my reverie. Its tone was that of some one in great pain or distress. I stopped and listened. Again the cry was repeated, coming from across the creek. Perhaps some one had come from Essex and had suffered some mishap, as buried by a snow slide - or a broken leg. With my binoculars I scanned the mountain side, as again there came to me the same voice in the same distressed tone. I yelled, "Hey!", "What!" several times. I thot the voice replied, "Help!", and called again. I had just decided to cross the creek to investigate more closely when the mystery solved itself--the old bear and two cubs came in to view near the place where the voice occurred. One of the cubs, half the size of his twin, couldn't keep up with the rest of the family, but lagged about fifty feet behind. About every ten feet of travel, the little fellow would squeal in protest. I suppose that he was calling in bear language to his mother to wait. I'm not sure, but thru the glasses it looked to me as tho tears as big as baseballs were rolling down his cheeks. - Ben Miller, Park Ranger

I observed in May where a small bear had killed a porcupine and had eaten all but a very few quills and little hair. The young bruin doubtless has a bad case of stomach trouble. - Clyde Fauley, Park Ranger

During April I observed my first jackrabbit within the Two Medicine District. It went across the open Two Medicine Ridge in leaps like a mule deer. - Clyde Fauley, Park Ranger

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practices. It provides work for many without private taxation, the pay is high, and the animal is used. But for getting the "killer," hounds that run by sight and year-round hunting are necessary. By this means harmless animals can be spared. The renegade is singled out at the site of its misdeeds, followed, jumped, and quickly dispatched. With good dogs, one man can easily equal in a few weeks the achievements of a fulltime control man using poison and traps and working all year long.

In review: Regarding the western part of the United States the coyote by reason of its high rate of reproduction, adaptability, and cunning, will persist in spite of efforts to exterminate it. A few will persist after other valuable species are exterminated by efforts directed at the coyote. Therefore, any method of control used should not be destructive to valuable fur-bearers, game, and other beneficial wild life. The coyote has virtues which make it worth encouraging in certain areas. Outstanding among these are its services as a disease eliminator among game, as a preventive of bubonic plague and other plagues dreaded by man, as a check on harmful rodents, as an eliminator of decrepit game which may damage crops, and last, but not least, as a valuable fur bearer. The coyote has faults of which the following are noteworthy: It contracts and sometimes spreads rabies. Renegade individuals destroy sheep and sometimes poultry Where this occurs, control must be resorted to. Any effective method of control must permit singling out the individual which does the damage. The best methods of control are winter trapping, supplemented where necessary by the year around use of hounds against individual culprits.

I am personally of the opinion that predatory control measures are necessary at times when they (coyotes) endanger the perpetuation of other species. However, in all but a few instances the problem can be localized and it is my opinion that there never was and never will bejustification for a general and continuing war on coyotes in this or any other park. If we are to have game as a spectacle I think it must be admitted that the average tourist would be five times as interested in seeing a coyote as he would a deer and this should be given consideration. In other words, right now a coyote is more valuable for our purpose. - E. T. Scoyen, Park Superintendent

The evidence that deer have increased beyond carrying capacity of the range should be obvious even to the most casual observer. In one ranger report for April (1933) it is stated that all the brush in the deer yards of his district has been gnawed down to branches an inch in diameter. When such conditions as these exist, and they do exist generally thruout the west side of the Park, it is time to let predatory animals establish a balance within a reasonable range capacity. - E. T. Scoyen, Superintendent

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TOPICS ON GAME MANAGEMENT IN GLACIER PARK

G. E. Wright,
Chief, Wild Life Survey

It seems to me that the two problems, one relative to coyote depredations upon mountain sheep at Many Glacier of the east side, and the other to do with coyote-deer relationships on the west side are entirely distinct and should be treated that way.

The feeding of mountain sheep near the Many Glacier Hotel is a problem in management. If it is necessary that the sheep be fed in the winter in order to preserve the species for the Park, it is certainly only right that they should be protected from coyote damage in the vicinity of the feeding station. To bait the animals to their destruction by concentrating them in a situation where they are unduly exposed to their enemies would certainly not be good management.

We have struggled with the problem of coyote-deer relationships for a long time and I am frank to say that we have never yet felt that we could accurately evaluate the effect of coyotes upon any deer population. As a practical approach in resolving the problem, I would say that control measures could properly be undertaken if and when:

1. The deer population is known to be at an alarmingly low ebb;
2. Coyotes are known to be present in unusual abundance;
3. Coyotes are known to be directly responsible for killing enough deer to be something of a factor; and
4. No other factor which is of greater potency than that of coyote damage can be discovered.

This may be a rather negative way of stating the case, but the fact remains that the relationship between deer and coyotes is still only a matter of opinion. It has been the subject of much argument for years and will surely continue to be for a long time, because it is only very recently that business-like studies have been undertaken.

In the meantime, Glacier Park has its current problems of game management which must be met. It is well to keep in mind that great fluctuations in animal populations are perfectly normal in nature and that we cannot hope and should not try to maintain the numbers of each species at anywhere near a fixed level. If an animal is extremely rare as a species, or is represented by so few individuals within the park that it is in real danger, there is every argument for interfering to save it.

The statement has been made that on the west side of the Park the coyote population far exceeds the amount necessary to create a game balance between the coyotes and deer. What the correct proportions between coyote and deer populations should be is something that no one can go so far as to state on the basis of our present knowledge, nor do I believe that it is possible to determine how many deer are killed by coyotes. It is rare to find a deer carcass which

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has not been visited by a coyote, but this is in no way proof of the cause of the death.

In connection with the present problem it occurs to me that no more than two years ago, deer were, if anything, too abundant on the west side of the Park. It would seem that the situation is one which would bear watching but does not justify any interference at the present time. If from this point of almost super-saturation deer have been reduced to the scarcity indicated by some, some factor additional to coyotes must be at work. However, so far as the coyote is concerned there is nothing to worry about. There is no danger whatsoever that it will be exterminated by the control methods which can be used within a park.

In the past, feeding grounds have been maintained for the deer in Glacier Park in winter. This creates a situation peculiarly favorable to coyote depredations. As this is a practice of doubtful worth, only justifiable when necessary to keep the animals within the boundaries of a preserve, as in the case of mountain sheep on Glacier's east side, or to avert wholesale starvation, I favor the experiment of discontinuing it for a few years.

We must also consider a point which has been mentioned in the past that both the mountain lion, which is by far the most important control species for deer, and the wolf, which is in all probability second in importance, have been eliminated from Glacier Park. It would take a great many coyotes and considerable shooting outside the Park to substitute for these two in the balance between deer and their coyote controls.

In spite of what reason may tell us, it is very difficult to break away from the precedent and out-worn sentiment which always has dictated that man, arch predator himself, shall protect game against those species whose normal food supply it is. Moreover, it is being realized more and more clearly that those animals which are predatory upon any species are a necessary part of its whole economy and beneficial to the population of that species within a given area. Wherever man has removed that control species, the ultimate result has been almost unlimited harm to the animal which he expected to protect. Witness the classic example of the Kaibab deer.

Perhaps the hardest thing for everybody to change is our natural psychological reaction to the killing of an ungulate by a carnivore A person's sympathy is invariably aroused in favor of the prey against its enemy. But inasmuch as the stated object of wild life administration in the parks is to allow the normal relationships of all species to each other to remain undisturbed, it becomes necessary to change this viewpoint. Only where man has placed an animal at an unusual disadvantage or when its actual extirpation is threatened is any interference with the normal relationships of species to each other really justified.

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St. Mary Lake is the site for the second report which was included in the monthly notes of Assistant Chief Ranger Art Best. "Several of the road crew reported to me that they saw four big timber wolves one evening watching some mule deer near the bridge at the foot of Upper St. Mary Lake. The men stopped the truck for several minutes to watch the wolves, which paid no attention to either the car or its occupants."

The final report originated in the Belly River District, for which area Ranger Doust included five wolves in his annual game report.

Bird Arrivals - The mild winter of 1933-'34 prompted an earlier return of birds to Glacier Park than the preceding one, which was very severe. Assistant Chief Ranger Croghan noted the presence of a robin at an unusual date, December 20. At times during mild winters in past years, varied thrushes have been seen, but the sight of a robin is rare and noteworthy indeed. For their return, however, most robins waited three more months. Ranger Buchanan found the first in the Polebridge District on March 12; a day later robins appeared with bluebirds at Lubec, a robin made an overnight stop near the Cutbank Station, and a varied thrush appeared at the head of Lake McDonald. By the middle of the month several robins were to be seen along the North Fork, and bluebirds and cedar waxwings were found at Many Glacier. The first robin report at Walton was for March 16; a bluebird came to Polebridge on the 17th. Walton had its first varied thrush on the 22nd. On March 23 robins and bluebirds were numerous at Lake McDonald. Park Ranger Cy Harkins noted in his March report "On the first day of spring a robin showed up at the station but got a rather cold reception." Not until April 6 was a robin, with a bluebird, welcomed at Belly River. At Belton headquarters the first arrivals noted by the Park Naturalist included: April 22 - ruby-crowned kinglet; May 6 - Audubon warbler; May 9 - red-eye vireo; May 16 - Louisiana tanager; May 18 - Wright flycatcher; May 26 - Townsend warbler; May 27 - olive-backed thrush; and May 28 - evening grosbeak.

Clematis
A June Blossom.

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WOLVES IN GLACIER PARK

M. N. D'Evelyn, Ranger Naturalist

Wolves have played but a minor part in the fauna of the Glacier Park region even before the Park was created, 1910. The fact that well-authenticated reports of wolves are received periodically hardly justifies the startling newsiness suggested by the title of the most recent report received at Headquarters, "Glacier Park Has a Wolf."

The reason for these infrequent but persistently occurring reports, say some out-doorsmen, is the ranging habits of the wolf. Tho he is not migratory and tho his summer range is limited to an area less than twenty miles across, the wolf's range may be doubled in winters when food is scarce. Wolves may come into Glacier Park from Canada, for example. On the other hand, Bailey says (1918) that the wolf is still found along the eastern edge of the Park, and that the characteristic shyness of the wolf may be the cause of his infrequent reports. A third reason often used to explain the reports is the common mistake of calling coyotes wolves, since the two carnivores do resemble each other in many ways, notably in the appearance of the coats. The main differences lie in the tail and in the call. The wolf carries a short tail high and the coyote a long tail low. A long smooth howl is the usual wolf call, while the coyote makes a series of short barks. The average wolf probably has greater strength than the average coyote, for the wolf has been known to kill animals as large as a moose. Size, however, is misleading as a difference between a wolf and a coyote, since the coyote frequenting the Glacier Park country is much larger than the prairie coyote, often approaching the wolf in size.

In 1927 Ranger Whitcraft told of four wolves killing sheep on the west side of the Narrows of Waterton Lake. In October of 1929 wolves were reported by several horseback parties on both Piegan Pass and Swiftcurrent Pass trails, while in the following year signs were noticed in the Belly River district.

The reports of this year began in April with Ranger Ben Miller observing one in the Walton District:

"The first time I saw him was on April 10, while looking over a piece of trail on Double Mountain with my trail foreman. The foreman said the animal was a wolf, but I wouldn't definitely call it a wolf even tho it looked quite large for a coyote. A few days later several of the trail crew, who say they know a wolf when they see one, saw the animal again, and pronounced it a wolf. The last time it was seen was on April 23 on Riverview Mountain." Hank Phillips and Pete Postle were two members of the trail crew reporting the wolf. The latter is a former trapper, native of the west, and for the past fifteen years a laborer in the Park. When seen by the Chief Ranger, the track was melted out and unrecognizable, but Miller believed he heard a wolf howl during the winter.

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UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
GLACIER NATIONAL PARK

GLACIAL DRIFT

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A popular pamphlet edited by the Park Naturalist and distributed gratis from time to time by the Educational Department of Glacier National Park to persons and organizations interested in the Park and its natural history.

Eivind T. Scoyen, Park Superintendent Dr. G. C. Ruhle, Editor

"Nature is the Art of God"

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Friends of Glacier National Park were grieved to learn of the passing on May 28 of Joseph M. Dixon, one of Montana's most distinguished citizens and influential in the creation of Glacier National Park. During his political career Dixon was United States congressman and senator from Montana, governor of the state, and first assistant Secretary of the Interior during the Hoover Administration. In this final capacity his most important public appearance in the state was as representative of the President during the dedication of the Waterton-Glacier International Peace Park on June 15, 1932. As senator, Mr. Dixon played a large part in putting thru Congress legislation leading to the creation of Glacier National Park. Others instrumental were Senator Tom Carter and Charles N. Pray, once sole representative of the state in the lower House and now Federal District Judge at Great Falls.

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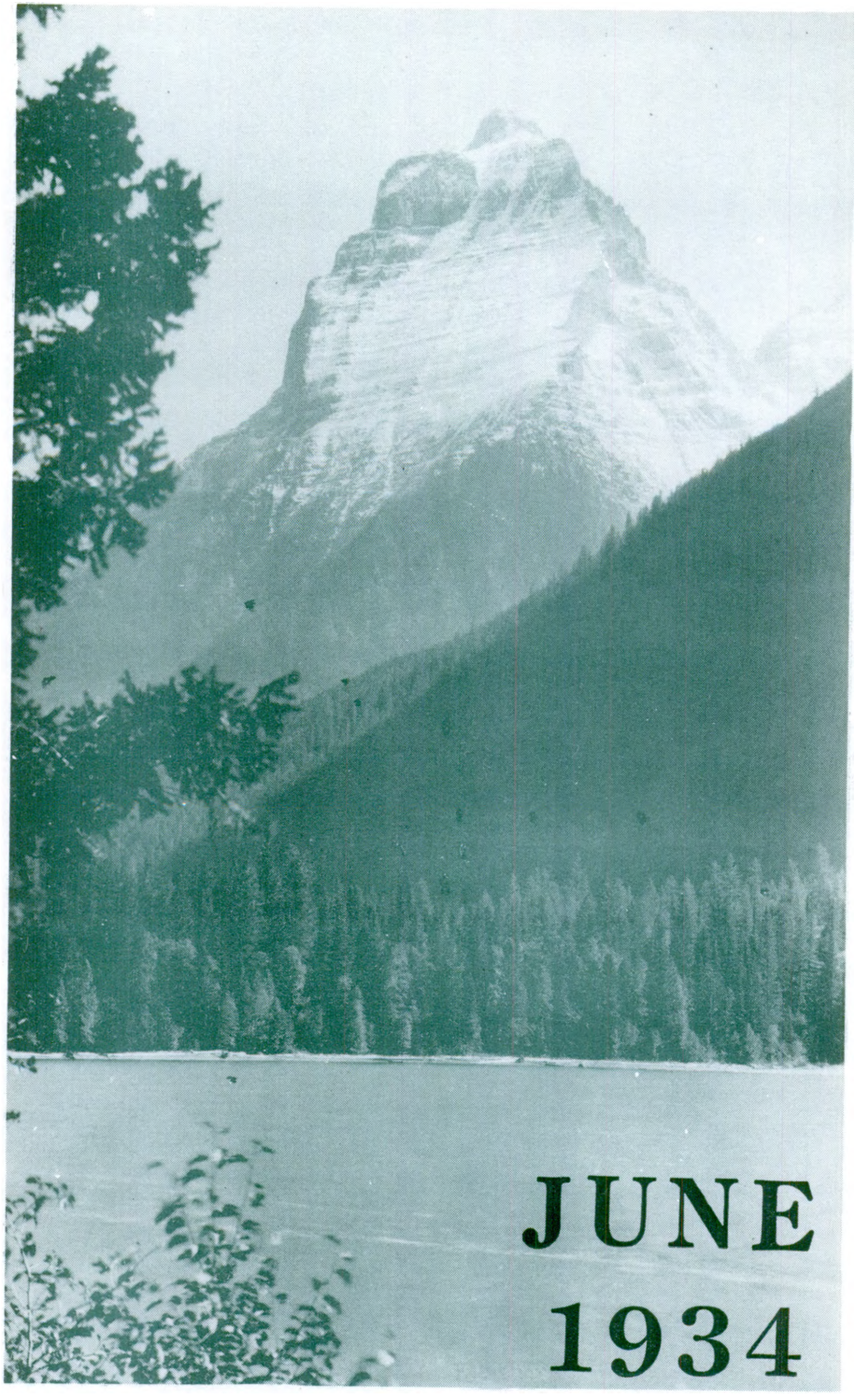
GLACIAL DRIFT



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preferably, shall be kept below the carrying capacity at every step until the range can be brought back to original productiveness.

12. That any native species which has been exterminated from the park area shall be brought back if this can be done, but if said species has become extinct no related form shall be considered as a candidate for reintroduction in its place.

13. That any exotic species which has already become established in a park shall be eliminated or held to a minimum provided complete eradication is not feasible.

14. That the threatening invasion of the parks by other exotics shall be anticipated; and to this end, since it is more than a local problem, encouragement shall be given for national and state cooperation in the creation of a board which shall regulate the transplanting of all wild species.

RELATIVE RELATIONS BETWEEN ANIMALS AND VISITORS -

15. That presentation of the animal life of the parks to the public shall be a wholly natural one.

16. That no animal shall be encouraged to become dependent upon man for its support.

17. That problems of injury to the persons of visitors or to their property or to the special interests of man in the park, shall be solved by methods other than those involving the killing of the animals or interfering with their normal relationships, where this is at all practicable.

RELATIVE FAUNAL INVESTIGATIONS -

18. That a complete faunal investigation, including the four steps of determining the primitive faunal picture, tracing the history of human influences, making a thoro zoological survey and formulating a wild-life administrative plan, shall be made in each park at the earliest possible date.

19. That the local park museum in each case shall be repository for a complete study skin collection for the area and for accumulated evidence attesting to original wild-life conditions.

20. That each park shall develop within the ranger department a personnel of one or more men trained in the handling of wild-life problems, and who will be assisted by the field staff appointed to carry out the faunal program of the Service.

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four bears". Rumor has it that Joe Kipp, connected closely with early park history and guide for George Bird Grinnell, designated this mountain as Four Bears after his distinguished grandfather, who was Mahtotopa.

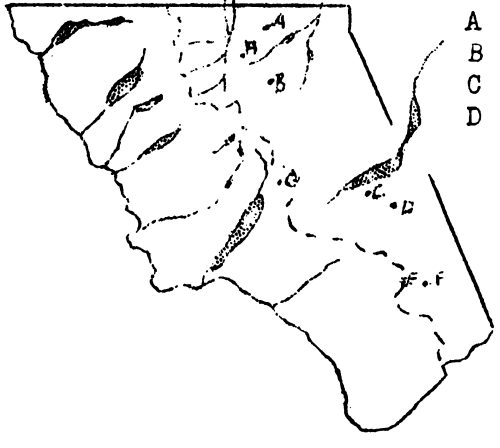
58. KAKITOS Mountain (8000 feet) stands above Red Eagle Lake, to the south and east. Kakitos is Blackfeet for star (Guardipor) and on the topographic map the peak is roughly shaped like a three-pointed star. The peak has no local designation.

59. PITAMAKAN Pass (7861 feet), over the Continental Divide, is known historically as Cutbank Pass and locally as Morgan Pass. The National Geographic Board has officially adopted the name Cutbank Pass for this defile, but popular usage has firmly tied this name to the important pass in the region, one quarter mile to the south-east. The Pass today is relatively unimportant and relatively unknown. Over the Pass which now bears her name in her honor, Pitamakan, or Running Eagle, the great Joan-of-Arc of the Blackfeet peoples, led her warriors one hundred and twenty years ago on their raids against the Salishan tribes. She was the only Piegan woman ever to win a man's name, and was killed by the Flatheads in battle.

60. SINOPAH Mountain (8300 feet) is the most prominent feature in the Two Medicine landscape. It is the most northeastern extremity of a spur running from Mt. Rockwell on the Continental Divide, by which name it is generally but erroneously referred. Sinopah is Blackfeet for the swift or kit fox of the East side and is also the name of a secret fraternal order. Sinopahki, Sinopah Woman, was the wife of Rising Wolf and the daughter of Lone Walker, powerful Blackfeet Chief. It is for her the naming of the mountain was suggested.

61. BEARHAT Mountain (8740 feet), rising near Hidden Lake and often the subject of tourist inquiry, was one of the finest unnamed peaks in the Park. It had no local designation. The name Bearhat, after a Kootenai Indian, was suggested for James W. Schultz for Hidden Lake.

62. WAHCHEACHAK Mountain (8300 feet) flanks Indian Pass on the west and is the most distinctive feature of the trail trip from Crossley Lake to Goathaunt. It had no local name. Wahcheachak, Spirit of the Mountains, is the Cree name for the sandhill crane and is mentioned by Frank B. Linderman in "Lige Mounts".



A Miche-Wabun Lake
B Old Sun Glacier
C Mahtotopa Mountain
D Kakitos Mountain
E Pitamakan Pass
F Sinopah Mountain
G Bearhat Mountain
H Wahcheachak Mountain.

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GLACIAL DRIFT

APRIL 1934

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or unnecessarily perilous. In some places these trail detours were so steep that the best progress was made on "all fours," and coupled with the heat of the bright motionless day, we found it necessary to rest our horses every hundred yards or so.

About 4:30 we rode onto the broad mossy Pass, a grand cirque of sloping meadows boxed in by the tremendous cliffs of Mt. Logan, Split, Almost-a-Dog, and a fourth, unnamed, mountains. Red Eagle Glacier, a brilliant patch of opalescent white, perched on the slope of Mt. Logan, and miniature lakes were set in the deep green of the meadows, themselves riotous with the color of late summer blooms. According to the number of shaggy fruits present, the snowy blossoms of the anemone or wind flower must have literally carpeted the Pass in the spring. Far below, several miles to the north lay Red Eagle Lake with its densely wooded shores.

The trail across the divide was marked only by infrequent stone "ducks". However, we managed to trace its course fairly well by holding to a west by north direction and guessing or using common sense when necessary, until we reached the far side, where we found cliffs and no trail ahead. By retracing several hundred yards we came across the markers again, leading abruptly north and downward. The steepness and shaley nature of the trail compelled us to do much walking until we reached the floor of the valley, where Hamilton and the Kutenais had stood off the Blackfeet in 1858. By 9:00 o'clock that night we had reached the snowshoe cabin on Red Eagle Creek our weariness forgotten in the exaltation of the historical associations of the trip we had just completed and the thrill of the vastness, the freedom, and the untrammeled wildness of Red Eagle Pass.

Bear Den - Early in January Park Ranger Frank Guardipee of the Nyack District discovered a bear den on the south slope of Three Suns Mountain, about three and one-half miles above the Nyack Station. He noticed an opening about the roots of a tamarack and peered under, expecting to find a bob-cat. What he did see was a drousy black bear, sitting in a hunched position. The rolling head and blinking eyes seemed to indicate that the warmth of the day awakened it from its winter hibernation. Dopey, the bear did not appear to be in the least perturbed by the appearance of a human. Subsequent visits revealed little of interest, except that two cubs appeared some time during the first ten days of February.

I don't believe there are more than four head of elk left now (March 1). Most of them left the Cutbank district earlier in the winter and met disaster on the Reservation.

- Hugh Peyton, Park Ranger
Cutbank Ranger Station

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Glacier as they do Sexton or Sperry Glaciers today. Chief Falls*, below the Glacier, carried an advertised sheer drop of two thousand feet, tho, like in so many similar instances, this placement among the highest sheer waterfalls of the world was unwarranted. Chief Falls still remains one of the most charming of falls. Three Slipper* and Red Eagle* Falls vie with it for be beauty. (*Popular names)

With the completion of highways, Red Eagle Pass became less and less the goal of dude parties until today, tho its scenery has not suffered from comparison with other more frequently used passes in the Park, it is seldom crossed. The overgrown state of the infrequently used trail makes the trip an arduous journey even on foot, as the Park Naturalist and I learned late last summer.

We left the Ranger Station on the Middle Fork of the Flathead towards noon of an August morning and followed the easy trail, shaded by cottonwoods and firs, up the Nyack Valley. Bedding and food, plus oats for our two saddle horses, for a week's outing was packed by a friendly but poky white mule.

Beyond the frequent grass fields near the lower snowshoe cabin and lying between the gently sloping sides of Three Suns and Loneman mountains, the trail passes into a steeper canyon, grandly climaxed by the precipitous walls of Mt. Stimson whose summit towers more than 6,000 feet overhead. Still farther on the path crossed a series of elk parks, areas where the elk had trampled down the snow during winter and had banded together for mutual protection. Near Mt. Thompson an avalanche had swept down the mountain side, forcing us to pick our way for nearly a quarter of a mile across a jumble of upturned earth, rocks, trees, and shrubs.

At dusk we came to a fork in the trail. To the north lay Red Eagle Pass; to the east and south, Pitamakan, Dawson, and Surprise Passes. Our first night's stopping place, the upper Nyack snowshoe cabin, lay several miles up the latter fork, following the historic Cutbank trail, beat in times past by the constant tread of scores of bands of marauding Piegans, bound to and from their raids on western tribes. Over this trail, Running Eagle, the Joan of Arc of the Blackfeet, had lead her warriors on many a successful marauding party. Over it a Salish guide had lead Tinkham in 1853 in the earliest fruitless search for Marias Pass. Dusk had turned to darkness when we had finished the day's ride, and it was fortunate that the welcome cabin stood directly on the trail.

On the following morning we retraced our steps to the trail fork, and noon found us high on the steep slopes south of the Pass. We soon learned that windfalls were frequent, since we were the only horseback party to make the crossing in two years, and that if we intended to reach the Pass that day we had better force our horses to scramble around these fallen trees whenever the wall upon which the trail clung was not so precipitous as to make this utterly impossible

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THE POLICY OF GLACIAL DRIFT

G. C. Ruhle, Park Naturalist

Apropos to certain questions appearing from time to time on the editor's desk, a statement of policy and procedure concerning articles appearing in GLACIAL DRIFT is not untimely.

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Seven huge swans spent several days in March at the head of lower St. Mary Lake. Several have been there off and on all winter.

- H. Doust, Park Ranger

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or unnecessarily perilous. In some places these trail detours were so steep that the best progress was made on "all fours," and coupled with the heat of the bright motionless day, we found it necessary to rest our horses every hundred yards or so.

About 4:30 we rode onto the broad mossy Pass, a grand cirque of sloping meadows boxed in by the tremendous cliffs of Mt. Logan, Split, Almost-a-Dog, and a fourth, unnamed, mountains. Red Eagle Glacier, a brilliant patch of opalescent white, perched on the slope of Mt. Logan, and miniature lakes were set in the deep green of the meadows, themselves riotous with the color of late summer blooms. According to the number of shaggy fruits present, the snowy blossoms of the anemone or wind flower must have literally carpeted the Pass in the spring. Far below, several miles to the north lay Red Eagle Lake with its densely wooded shores.

The trail across the divide was marked only by infrequent stone "ducks". However, we managed to trace its course fairly well by holding to a west by north direction and guessing or using common sense when necessary, until we reached the far side, where we found cliffs and no trail ahead. By retracing several hundred yards we came across the markers again, leading abruptly north and downward. The steepness and shaley nature of the trail compelled us to do much walking until we reached the floor of the valley, where Hamilton and the Kutenais had stood off the Blackfeet in 1858. By 9:00 o'clock that night we had reached the snowshoe cabin on Red Eagle Creek our weariness forgotten in the exaltation of the historical associations of the trip we had just completed and the thrill of the vastness, the freedom, and the untrammeled wildness of Red Eagle Pass.

Bear Den - Early in January Park Ranger Frank Guardipee of the Nyack District discovered a bear den on the south slope of Three Suns Mountain, about three and one-half miles above the Nyack Station. He noticed an opening about the roots of a tamarack and peered under, expecting to find a bob-cat. What he did see was a drousy black bear, sitting in a hunched position. The rolling head and blinking eyes seemed to indicate that the warmth of the day awakened it from its winter hibernation. Dopey, the bear did not appear to be in the least perturbed by the appearance of a human. Subsequent visits revealed little of interest, except that two cubs appeared some time during the first ten days of February.

I don't believe there are more than four head of elk left now (March 1). Most of them left the Cutbank district earlier in the winter and met disaster on the Reservation.

- Hugh Peyton, Park Ranger
Cutbank Ranger Station

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four bears". Rumor has it that Joe Kipp, connected closely with early park history and guide for George Bird Grinnell, designated this mountain as Four Bears after his distinguished grandfather, who was Mahtotopa.

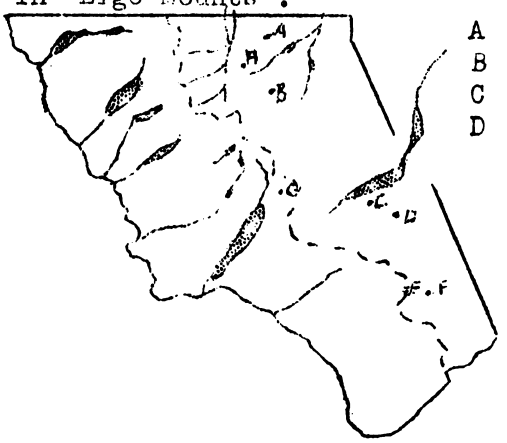
58. KAKITOS Mountain (8000 feet) stands above Red Eagle Lake, to the south and east. Kakitos is Blackfeet for star (Guardipee) and on the topographic map the peak is roughly shaped like a three-pointed star. The peak has no local designation.

59. PITAMAKAN Pass (7861 feet), over the Continental Divide, is known historically as Cutbank Pass and locally as Morgan Pass. The National Geographic Board has officially adopted the name Cutbank Pass for this defile, but popular usage has firmly tied this name to the important pass in the region, one quarter mile to the south-east. The Pass today is relatively unimportant and relatively unknown. Over the Pass which now bears her name in her honor, Pitamakan, or Running Eagle, the great Joan-of-Arc of the Blackfeet peoples, led her warriors one hundred and twenty years ago on their raids against the Salishan tribes. She was the only Piegan woman ever to win a man's name, and was killed by the Flatheads in battle.

60. SINOPAH Mountain (8300 feet) is the most prominent feature in the Two Medicine landscape. It is the most northeastern extremity of a spur running from Mt. Rockwell on the Continental Divide, by which name it is generally but erroneously referred. Sinopah is Blackfeet for the swift or kit fox of the East side and is also the name of a secret fraternal order. Sinopahki, Sinopah Woman, was the wife of Rising Wolf and the daughter of Lone Walker, powerful Blackfeet Chief. It is for her the naming of the mountain was suggested.

61. BEARHAT Mountain (8740 feet), rising near Hidden Lake and often the subject of tourist inquiry, was one of the finest unnamed peaks in the Park. It had no local designation. The name Bearhat, after a Kootenai Indian, was suggested for James W. Schultz for Hidden Lake.

62. WAHCHEACHAK Mountain (8300 feet) flanks Indian Pass on the west and is the most distinctive feature of the trail trip from Crossley Lake to Goathaunt. It had no local name. Wahcheachak, Spirit of the Mountains, is the Cree name for the sandhill crane and is mentioned by Frank B. Linderman in "Lige Mounts".



A Miche-Wabun Lake
B Old Sun Glacier
C Mahtotopa Mountain
D Kakitos Mountain
E Pitamakan Pass
F Sinopah Mountain
G Bearhat Mountain
H Wahcheachak Mountain.

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preferably, shall be kept below the carrying capacity at every step until the range can be brought back to original productiveness.

12. That any native species which has been exterminated from the park area shall be brought back if this can be done, but if said species has become extinct no related form shall be considered as a candidate for reintroduction in its place.

13. That any exotic species which has already become established in a park shall be eliminated or held to a minimum provided complete eradication is not feasible.

14. That the threatening invasion of the parks by other exotics shall be anticipated; and to this end, since it is more than a local problem, encouragement shall be given for national and state cooperation in the creation of a board which shall regulate the transplanting of all wild species.

RELATIVE RELATIONS BETWEEN ANIMALS AND VISITORS -

15. That presentation of the animal life of the parks to the public shall be a wholly natural one.

16. That no animal shall be encouraged to become dependent upon man for its support.

17. That problems of injury to the persons of visitors or to their property or to the special interests of man in the park, shall be solved by methods other than those involving the killing of the animals or interfering with their normal relationships, where this is at all practicable.

RELATIVE FAUNAL INVESTIGATIONS -

18. That a complete faunal investigation, including the four steps of determining the primitive faunal picture, tracing the history of human influences, making a thoro zoological survey and formulating a wild-life administrative plan, shall be made in each park at the earliest possible date.

19. That the local park museum in each case shall be repository for a complete study skin collection for the area and for accumulated evidence attesting to original wild-life conditions.

20. That each park shall develop within the ranger department a personnel of one or more men trained in the handling of wild-life problems, and who will be assisted by the field staff appointed to carry out the faunal program of the Service.

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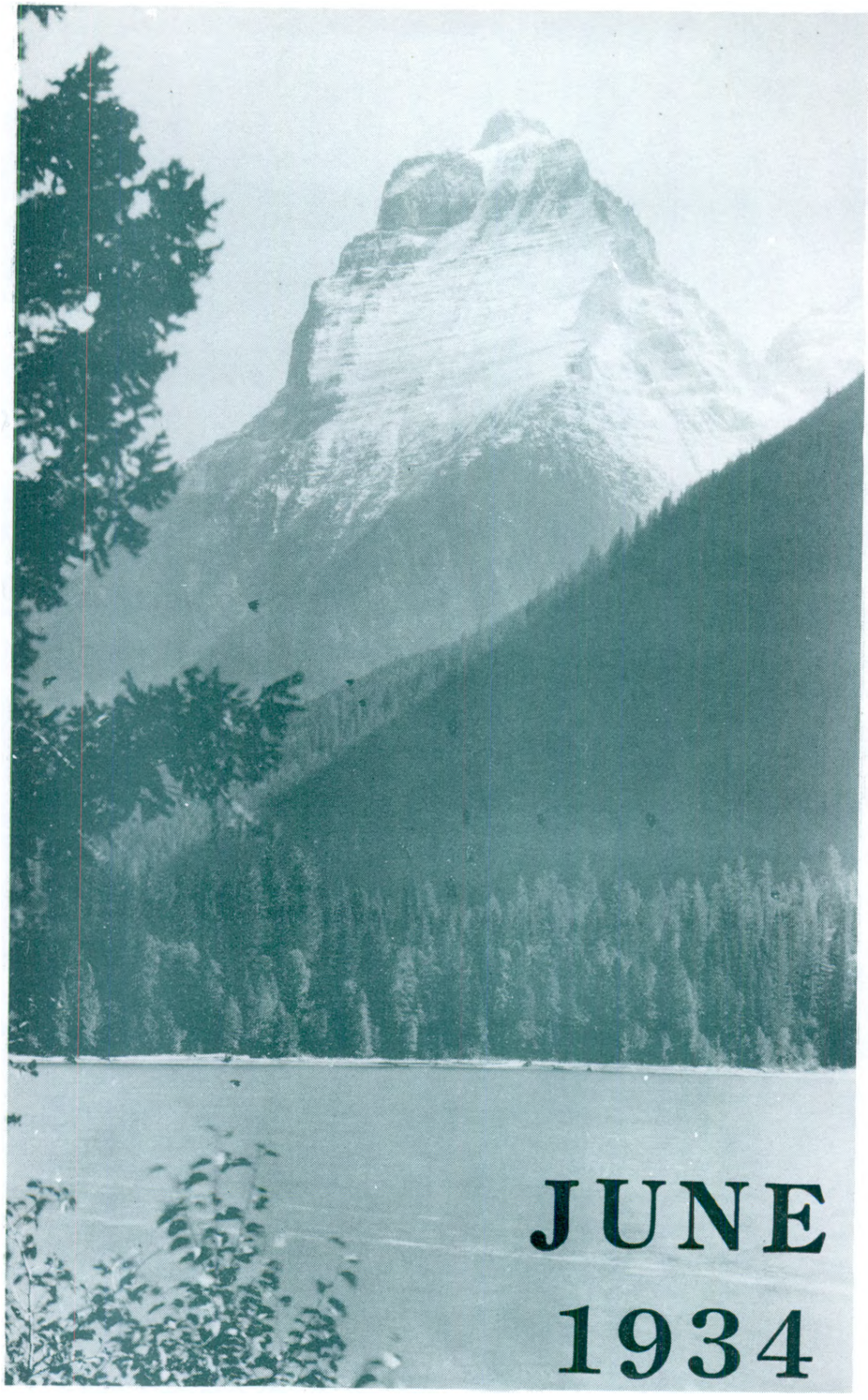

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UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
GLACIER NATIONAL PARK

GLACIAL DRIFT

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Eivind T. Scoyen, Park Superintendent Dr. G. C. Ruhle, Editor

"Nature is the Art of God"

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Friends of Glacier National Park were grieved to learn of the passing on May 28 of Joseph M. Dixon, one of Montana's most distinguished citizens and influential in the creation of Glacier National Park. During his political career Dixon was United States congressman and senator from Montana, governor of the state, and first assistant Secretary of the Interior during the Hoover Administration. In this final capacity his most important public appearance in the state was as representative of the President during the dedication of the Waterton-Glacier International Peace Park on June 15, 1932. As senator, Mr. Dixon played a large part in putting thru Congress legislation leading to the creation of Glacier National Park. Others instrumental were Senator Tom Carter and Charles N. Pray, once sole representative of the state in the lower House and now Federal District Judge at Great Falls.

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WOLVES IN GLACIER PARK

M. N. D'Evelyn, Ranger Naturalist

Wolves have played but a minor part in the fauna of the Glacier Park region even before the Park was created, 1910. The fact that well-authenticated reports of wolves are received periodically hardly justifies the startling newsiness suggested by the title of the most recent report received at Headquarters, "Glacier Park Has a Wolf."

The reason for these infrequent but persistently occurring reports, say some out-doorsmen, is the ranging habits of the wolf. Tho he is not migratory and tho his summer range is limited to an area less than twenty miles across, the wolf's range may be doubled in winters when food is scarce. Wolves may come into Glacier Park from Canada, for example. On the other hand, Bailey says (1918) that the wolf is still found along the eastern edge of the Park, and that the characteristic shyness of the wolf may be the cause of his infrequent reports. A third reason often used to explain the reports is the common mistake of calling coyotes wolves, since the two carnivores do resemble each other in many ways, notably in the appearance of the coats. The main differences lie in the tail and in the call. The wolf carries a short tail high and the coyote a long tail low. A long smooth howl is the usual wolf call, while the coyote makes a series of short barks. The average wolf probably has greater strength than the average coyote, for the wolf has been known to kill animals as large as a moose. Size, however, is misleading as a difference between a wolf and a coyote, since the coyote frequenting the Glacier Park country is much larger than the prairie coyote, often approaching the wolf in size.

In 1927 Ranger Whitcraft told of four wolves killing sheep on the west side of the Narrows of Waterton Lake. In October of 1929 wolves were reported by several horseback parties on both Piegan Pass and Swiftcurrent Pass trails, while in the following year signs were noticed in the Belly River district.

The reports of this year began in April with Ranger Ben Miller observing one in the Walton District:

"The first time I saw him was on April 10, while looking over a piece of trail on Double Mountain with my trail foreman. The foreman said the animal was a wolf, but I wouldn't definitely call it a wolf even tho it looked quite large for a coyote. A few days later several of the trail crew, who say they know a wolf when they see one, saw the animal again, and pronounced it a wolf. The last time it was seen was on April 23 on Riverview Mountain." Hank Phillips and Pete Postle were two members of the trail crew reporting the wolf. The latter is a former trapper, native of the west, and for the past fifteen years a laborer in the Park. When seen by the Chief Ranger, the track was melted out and unrecognizable, but Miller believed he heard a wolf howl during the winter.

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St. Mary Lake is the site for the second report which was included in the monthly notes of Assistant Chief Ranger Art Best. "Several of the road crew reported to me that they saw four big timber wolves one evening watching some mule deer near the bridge at the foot of Upper St. Mary Lake. The men stopped the truck for several minutes to watch the wolves, which paid no attention to either the car or its occupants."

The final report originated in the Belly River District, for which area Ranger Doust included five wolves in his annual game report.

Bird Arrivals - The mild winter of 1933-'34 prompted an earlier return of birds to Glacier Park than the preceding one, which was very severe. Assistant Chief Ranger Croghan noted the presence of a robin at an unusual date, December 20. At times during mild winters in past years, varied thrushes have been seen, but the sight of a robin is rare and noteworthy indeed. For their return, however, most robins waited three more months. Ranger Buchanan found the first in the Polebridge District on March 12; a day later robins appeared with bluebirds at Lubec, a robin made an overnight stop near the Cutbank Station, and a varied thrush appeared at the head of Lake McDonald. By the middle of the month several robins were to be seen along the North Fork, and bluebirds and cedar waxwings were found at Many Glacier. The first robin report at Walton was for March 16; a bluebird came to Polebridge on the 17th. Walton had its first varied thrush on the 22nd. On March 23 robins and bluebirds were numerous at Lake McDonald. Park Ranger Cy Harkins noted in his March report "On the first day of spring a robin showed up at the station but got a rather cold reception." Not until April 6 was a robin, with a bluebird, welcomed at Belly River. At Belton headquarters the first arrivals noted by the Park Naturalist included: April 22 - ruby-crowned kinglet; May 6 - Audubon warbler; May 9 - red-eye vireo; May 16 - Louisiana tanager; May 18 - Wright flycatcher; May 26 - Townsend warbler; May 27 - olive-backed thrush; and May 28 - evening grosbeak.

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has not been visited by a coyote, but this is in no way proof of the cause of the death.

In connection with the present problem it occurs to me that no more than two years ago, deer were, if anything, too abundant on the west side of the Park. It would seem that the situation is one which would bear watching but does not justify any interference at the present time. If from this point of almost super-saturation deer have been reduced to the scarcity indicated by some, some factor additional to coyotes must be at work. However, so far as the coyote is concerned there is nothing to worry about. There is no danger whatsoever that it will be exterminated by the control methods which can be used within a park.

In the past, feeding grounds have been maintained for the deer in Glacier Park in winter. This creates a situation peculiarly favorable to coyote depredations. As this is a practice of doubtful worth, only justifiable when necessary to keep the animals within the boundaries of a preserve, as in the case of mountain sheep on Glacier's east side, or to avert wholesale starvation, I favor the experiment of discontinuing it for a few years.

We must also consider a point which has been mentioned in the past that both the mountain lion, which is by far the most important control species for deer, and the wolf, which is in all probability second in importance, have been eliminated from Glacier Park. It would take a great many coyotes and considerable shooting outside the Park to substitute for these two in the balance between deer and their coyote controls.

In spite of what reason may tell us, it is very difficult to break away from the precedent and out-worn sentiment which always has dictated that man, arch predator himself, shall protect game against those species whose normal food supply it is. Moreover, it is being realized more and more clearly that those animals which are predatory upon any species are a necessary part of its whole economy and beneficial to the population of that species within a given area. Wherever man has removed that control species, the ultimate result has been almost unlimited harm to the animal which he expected to protect. Witness the classic example of the Kaibab deer.

Perhaps the hardest thing for everybody to change is our natural psychological reaction to the killing of an ungulate by a carnivore A person's sympathy is invariably aroused in favor of the prey against its enemy. But inasmuch as the stated object of wild life administration in the parks is to allow the normal relationships of all species to each other to remain undisturbed, it becomes necessary to change this viewpoint. Only where man has placed an animal at an unusual disadvantage or when its actual extirpation is threatened is any interference with the normal relationships of species to each other really justified.

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TOPICS ON GAME MANAGEMENT IN GLACIER PARK

G. E. Wright,
Chief, Wild Life Survey

It seems to me that the two problems, one relative to coyote depredations upon mountain sheep at Many Glacier of the east side, and the other to do with coyote-deer relationships on the west side are entirely distinct and should be treated that way.

The feeding of mountain sheep near the Many Glacier Hotel is a problem in management. If it is necessary that the sheep be fed in the winter in order to preserve the species for the Park, it is certainly only right that they should be protected from coyote damage in the vicinity of the feeding station. To bait the animals to their destruction by concentrating them in a situation where they are unduly exposed to their enemies would certainly not be good management.

We have struggled with the problem of coyote-deer relationships for a long time and I am frank to say that we have never yet felt that we could accurately evaluate the effect of coyotes upon any deer population. As a practical approach in resolving the problem, I would say that control measures could properly be undertaken if and when:

1. The deer population is known to be at an alarmingly low ebb;
2. Coyotes are known to be present in unusual abundance;
3. Coyotes are known to be directly responsible for killing enough deer to be something of a factor; and
4. No other factor which is of greater potency than that of coyote damage can be discovered.

This may be a rather negative way of stating the case, but the fact remains that the relationship between deer and coyotes is still only a matter of opinion. It has been the subject of much argument for years and will surely continue to be for a long time, because it is only very recently that business-like studies have been undertaken.

In the meantime, Glacier Park has its current problems of game management which must be met. It is well to keep in mind that great fluctuations in animal populations are perfectly normal in nature and that we cannot hope and should not try to maintain the numbers of each species at anywhere near a fixed level. If an animal is extremely rare as a species, or is represented by so few individuals within the park that it is in real danger, there is every argument for interfering to save it.

The statement has been made that on the west side of the Park the coyote population far exceeds the amount necessary to create a game balance between the coyotes and deer. What the correct proportions between coyote and deer populations should be is something that no one can go so far as to state on the basis of our present knowledge, nor do I believe that it is possible to determine how many deer are killed by coyotes. It is rare to find a deer carcass which

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practices. It provides work for many without private taxation, the pay is high, and the animal is used. But for getting the "killer," hounds that run by sight and year-round hunting are necessary. By this means harmless animals can be spared. The renegade is singled out at the site of its misdeeds, followed, jumped, and quickly dispatched. With good dogs, one man can easily equal in a few weeks the achievements of a fulltime control man using poison and traps and working all year long.

In review: Regarding the western part of the United States the coyote by reason of its high rate of reproduction, adaptability, and cunning, will persist in spite of efforts to exterminate it. A few will persist after other valuable species are exterminated by efforts directed at the coyote. Therefore, any method of control used should not be destructive to valuable fur-bearers, game, and other beneficial wild life. The coyote has virtues which make it worth encouraging in certain areas. Outstanding among these are its services as a disease eliminator among game, as a preventive of bubonic plague and other plagues dreaded by man, as a check on harmful rodents, as an eliminator of decrepit game which may damage crops, and last, but not least, as a valuable fur bearer. The coyote has faults of which the following are noteworthy: It contracts and sometimes spreads rabies. Renegade individuals destroy sheep and sometimes poultry Where this occurs, control must be resorted to. Any effective method of control must permit singling out the individual which does the damage. The best methods of control are winter trapping, supplemented where necessary by the year around use of hounds against individual culprits.

I am personally of the opinion that predatory control measures are necessary at times when they (coyotes) endanger the perpetuation of other species. However, in all but a few instances the problem can be localized and it is my opinion that there never was and never will bejustification for a general and continuing war on coyotes in this or any other park. If we are to have game as a spectacle I think it must be admitted that the average tourist would be five times as interested in seeing a coyote as he would a deer and this should be given consideration. In other words, right now a coyote is more valuable for our purpose. - E. T. Scoyen, Park Superintendent

The evidence that deer have increased beyond carrying capacity of the range should be obvious even to the most casual observer. In one ranger report for April (1933) it is stated that all the brush in the deer yards of his district has been gnawed down to branches an inch in diameter. When such conditions as these exist, and they do exist generally thruout the west side of the Park, it is time to let predatory animals establish a balance within a reasonable range capacity. - E. T. Scoyen, Superintendent

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Mascot - Less than a day after the CCC unit at Anaconda Creek moved into camp this spring the boys acquired a mascot, a spindle-legged moose calf. The youngster was found along the road during the first day and was brought into camp. Tho the officers and work foreman immediately had the baby returned to where it was found, fearing the wrath of the mother, the mascot returned the next morning and waited in front of the kitchen door. The ways of man did not satisfy the baby moose however, for in a few days it wandered off again. - Tom Mooney, Temporary Ranger

Albino Elk - On April 14 on Lee Ridge I discovered a group of seven elk, one of which appeared to be an albino. By stalking very carefully I approached within one hundred yards and saw that the animal was not pure white all over, but that the body was a dirty white color with the legs and head a little darker. It appeared to be quite young; two or three years old, I should judge. - Elmer Fladmark, Park Ranger

Bear Prank - One balmy spring day I was wondering as I hiked down the Ole Creek trail whether I would meet again the mother bear with her two cubs that I had seen farther up the creek. All at once a voice, shouting my name, awakened me from my reverie. Its tone was that of some one in great pain or distress. I stopped and listened. Again the cry was repeated, coming from across the creek. Perhaps some one had come from Essex and had suffered some mishap, as buried by a snow slide - or a broken leg. With my binoculars I scanned the mountain side, as again there came to me the same voice in the same distressed tone. I yelled, "Hey!", "What!" several times. I thot the voice replied, "Help!", and called again. I had just decided to cross the creek to investigate more closely when the mystery solved itself--the old bear and two cubs came in to view near the place where the voice occurred. One of the cubs, half the size of his twin, couldn't keep up with the rest of the family, but lagged about fifty feet behind. About every ten feet of travel, the little fellow would squeal in protest. I suppose that he was calling in bear language to his mother to wait. I'm not sure, but thru the glasses it looked to me as tho tears as big as baseballs were rolling down his cheeks. - Ben Miller, Park Ranger

I observed in May where a small bear had killed a porcupine and had eaten all but a very few quills and little hair. The young bruin doubtless has a bad case of stomach trouble. - Clyde Fauley, Park Ranger

During April I observed my first jackrabbit within the Two Medicine District. It went across the open Two Medicine Ridge in leaps like a mule deer. - Clyde Fauley, Park Ranger

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JULY 1934

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UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF NATIONAL PARKS, BUILDINGS, AND RESERVATIONS
GLACIER NATIONAL PARK

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Eivind T. Scoyen, Park Superintendent | Dr. G. C. Ruhle, Editor

"Nature is the Art of God"

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I take the stand that to many visitors a coyote may be a far more stimulating sight than deer. How thankful I would be if all park men could finally get the view point that unmodified nature is the real goal set for wild life administration in the national parks.

Dr. H. C. Bryant, Ass't Director
Office of National Parks,
Buildings, and Reservations

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HUGH LENOX SCOTT 1853 - 1934

"Be noble, and the nobility that lies in other men,
"Sleeping, tho never dead, will rise in majesty to meet thine own."

To the park naturalist, his friend and companion on visits to Northwest Indian tribes during the closing years of life, Major-General Hugh Lenox Scott quoted the above as a great guiding principle of life, the proof of which was the abundant reward of his life. It is quoted here as being exemplified in ample measure by Scott's rich and well-spent life. Firmness in the right as he saw it, honesty, consideration, bravery, all of his strongest traits can be regarded as corollary to a graceful nobility which was the man himself. Sympathy for and understanding of the position of the other man, regardless of race or religion, were his in great measure. Lying on his hospital cot in Washington last spring, he dreamed of the sunshine and open expanse of the Great Plains so dear to his heart. Out there, tom-toms beat with slow, sinister rythm and smoke rose in thin, straight columns while his erstwhile antagonists, the Indians, poured out their hearts in love and prayer for his speedy recovery. But Death claimed him for his own, and rewarded the aged warrior with the gift of eternal peace.

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cycle nor a period of early warm weather can explain its intermittent seasons of splendor; however, the weather has apparently suited other Park flowers well. The drier meadows are colored by great clumps of showy gaillardia with its orange and red heads reaching almost unprecedented size, and the hillside near St. Marys and elsewhere are a sheet of blue with the bush lupine (Lupinus tenellus).

As we drive along, lost in admiration of this beautiful lupine, our attention is suddenly caught by a strange phenomenon. In the midst of the deep lavender plants is one with pink flowers, fresh and lovely and so strikingly different that no one could fail to observe it. A closer examination reveals that aside from the color distinction there is a slight difference in the shape of the leaflets. Where did this plant come from? It appears to be quite alone. It doesn't seem likely that a difference in soil could explain the problem, as it is within a few feet of the purple plants and the soil appears the same thruout. Is this a mutant, the result of that strange prank of nature whereby occasionally an individual suddenly springs into being quite unlike its parents in some respects. Such mutation has been the manner, many botanists believe, in which some new species of plants arise. As we see about us the confusing array of flowers and realize that there are nearly 900 species in the Park and that this is but a handful of the 125,000 species that clothe the surface of the earth, we are impressed anew with the complexity of their ancient lineage.

*****

PLANT MIGRATION

W. T. McLaughlin,
Ranger Naturalist

One of the strange and interesting plants of the park is the devil's club, Echinopanax, with its large maple-like leaves and spine-covered branches. It prefers low moist thickets and may form a barrier painful to the trespasser. Perhaps the strangest thing about this plant is its range thruout the world. It occurs in the Pacific Northwest and east to the Rockies where it is limited, with only occasional exceptions, to the west slope; it is also found native in Japan. If we proceed eastward a thousand miles across the plains and prairies we find it in an area circumscribing Lake Superior. You may say that a bird must have carried the seed there. Altho it develops showy red berries later in the summer I have never seen a bird eat them. Moreover, the migration of most of our western birds is north and south rather than east and west.

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feasting on the top of the mountain on July 15th, (with the difference that the Salish removed the skins of the dogs before putting the meat into the pot, but big Chief Scoyen made his guests eat the hot dogs with the skin still on,) and there was much pow-wowing and dancing and smoking of the peace pipe, and when the day was over and the moon came over the mountain, the Blackfeet looked at the moon over their right shoulders but the Salish were careless and thoughtless and looked at the moon over their left shoulders. When the moon went behind a mountain, the Salish laid down by their camp fires, wrapped themselves in their buffalo robes and drifted into happy, careless sleep for they felt that they were safe because they had been told by a big chief of the Blackfeet that they were perfectly safe, that there wasn't an oil promoter or other white man within a thousand miles of them. But the Blackfeet were restless and bothered with much insomnia and when they took themselves unto their couches beside the smouldering camp fires, the raw hide ropes concealed by their buffalo robes pressed against their bodies and reminded them of the purpose of the meeting. When the moon was dark they quietly rose and they went back towards the rising sun to the teepees of their people, but they didn't go afoot. That is the reason, my children, why on July 15th, 1933, at Doc Ruhle's big pow-wow the Blackfeet rode proudly towards the setting sun, mounted on horses, and the Salish and Kootenais walked lamely and sore footedly towards the rising sun, and that is why, my children, that the Blackfeet danced with more abandon, and sang with more volume, if not with more melody than did the Kootenais and the Salish. From the time of which I speak, the children of the Kootenai and the Salish have been the forgotten men, and the children of the Blackfeet, the capitalists. That is why the face of one of their great chiefs appears on the buffalo nickel, and why they look forward with pleasant anticipation to the day when more oil wells will come in on their reservation and the face of the chief will appear on the silver dollar; yea, even on the twenty dollar gold piece of present weight and fineness. That is why, when the Hudson Bay and Northwest Company traders came among them, they found them opulent and full of pep and arrogant and proud. They demanded the thunder and lightning from the traders so that they might go against their enemies and with the bright tubes of the white metal that spoke with thunder and lightning and drive them from the disputed hunting grounds. That is why, with the weapons of the traders of the Hudsons Bay and Northwest Company, they went on down to Snake Creek close by the village of Chinook which is pitched on the bank of the river, the waters of which run white as milk, to the eastward of the great sage brush metropolis of the great falls of the Missouri, and there they found the proud and hitherto triumphant Shoshone and they approached them and they discharged the powder and lead from the tubes of iron which they held in their hands and the Shoshone, or as they are sometimes called, the Snakes, thought that the Great Spirit had given their enemies the thunder and lightning and they said unto themselves "skidoo for us" and they did Skidoo; And they went back from the land

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As a boy I lived among the Blackfeet. For forty years I have lived where the Salish and the Kootenais pitch their teepees on the shores of the great inland fresh water sea, where "a billion dew-drops are garnered in a bowl", as my good friend Charlie Towne has so eloquently and poetically described the Lake of Salish. A wave of sadness came over me as I saw the proud Blackfeet, all mounted on horses, their faces towards the setting sun riding solemnly and with great dignity to the crest of the Pass, there to plant in the ground a blunt stick, bedecked with eagle feathers, and then to ride solemnly back to take up a position behind a screen of stunted and windswept evergreens. Then the scouts of the Salish and the Kootenai, their faces toward the rising sun, approached the token of amity and good will, slowly circling around it, eying it with suspicion and wary of the Greeks bearing gifts but finally removing the token and carrying it back to the chiefs of their party. Then the approach of the two parties, the hand shaking, the big pow-wow, the peace pipe, the dance and the tomahawk was buried forever. Thereby hangs a tale more or less veracious. I have said that the sight saddened me--it did, because of the legends of the Salish. Time there was when the Blackfeet roamed the prairies of what is now Northern Montana and the great expanses of Western Canada, afoot, armed only with bows and arrows with flint heads, and the Salish lived on the shores of the great lake and river to the West and the Kootenai on the great Flat Bow to the North. While the Blackfeet were yet killing their buffalo by running them over cliffs, dispatching the mangled animals with bow and arrow, the marauding Shoshone, neighbors of the Salish and the Kootenai brought to the villages of the latter wonderful animals with flowing manes and tails to haul their travois and to supply mounts upon which they could travel for many miles each day without fatigue. These were filched from the "men who pound on iron" many moons travel to the East and to the South, yes, even to the great river which cuts its path a mile deep in the painted rocks of the desert. One day a party of Blackfeet wound their way up through one of the canyons near unto the scene of the holiday festivities of July 15th, and coming to the Lake of Salish they saw the braves and squaws and papooses of that people disporting themselves in the waters of the Lake and riding about on the strange animals with flowing manes and tails, and their hearts were filled with envy and covetousness. They returned to the villages of their people. There they removed the hair from the hides of many buffalos and they cut the raw hides into strips and they braided the strips into long ropes sometimes called lariats and riatas and lass ropes, depending upon the tribes of white and red Indians where these contraptions were want to be used. They sent for Will Rogers, Charlie Russell, Bill Davis and other specimens of the genus that made their living by punching the cow and riding the bronc. They knelt at the feet of these white Indians and learned to throw the noose of their raw hide ropes with dexterity and efficiency, and when they had learned all that the white Indian could show them, they again crossed over the mountain with the ropes concealed under their buffalo robes. They approached the camp of the Salish, and they held their right hands up with the palms forward, in token of peace and they were invited into the camp of the Salish and there the fires were poked up and fed with the resinous wood of pine and larch and the sweet smelling cotton wood and willow and alder. Many dogs were sacrificed and there was great feasting like unto the

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THE GREAT POW-WOW*

by

SOURDOUGH SAM

The other day, to be exact July 15th, 1933, with a bunch of Indians whose teepees are pitched where the waters of Libby and Callahan Creeks mingle with those of the Great River of the Flat Bow, now called the Kootenai, I climbed through Bill Logan's Pass, and after much back firing and puffing and boiling over of radiators and exhaustion of vacuum tanks, reached the Summit of the Great Divide that separates the Bay of Hudson and the two great salt water lakes that lave the shores of the continent. Here we found what the big medicine men called a natural amphi-theatre, if you know what I mean, and here were assembled the big chiefs and braves and squaws from the Salish and the Blackfeet; from the prize fight metropolis where the big railroad divides--part of it going east and west and part of it going south; from the wigwams on the bank of the Cut Bank and from the sage brush metropolis where the waters of the big river tumble over the high rocks and the juice of the dynamo is distributed to many camps and villages in the great State of Montana. Also, there were big chiefs and braves from the village of Last Chance, which Marcus Daley and his cohorts christened the Athens of Montana, and the blankets of these chiefs and braves and their squaws and papooses were of many colors, contrasting with the buckskin colored blankets worn by Chief Scoyen and his lieutenants and the big chiefs of the mighty "Walk-a-Heap" from the Fort on the banks of the Bitterroot near Hellgate, a scene of gorgeous and resplendent coloring was presented. Yea, and there was also a big chief from the land of heap snow to the north, and many there were from the big villages east and west of the borders of Montana. These pilgrims sat upon snow banks, the like of which they had never before seen, and they beheld for the first time the Indians of Montana, which must have been a treat unto their eyes. Among those who gathered there on the mountain top to lay down the law and to tell the people about the new deal were braves who had wintered in the big wigwams at Washington and Helena, and eloquent and highly edifying was the flow of oratory, and the people went about among themselves talking, one to the other about the prowess of the engineers and contractors who had made it possible for them to bring their eight, twelve, and sixteen cylinder travois and red river carts up to the very top of the backbone of the great continent of North America.

After the big pow-wow was over, then it was that the great pacificator and peace maker, Doc Ruhle, brought the warring tribes of the Salish and Kootenais, the Blackfeet and Piegans together and there in that solemn environment of beetling crags, drifted snow, flower and pine bedecked and ornamented canyons, the tribes buried the tomahawk forever.

*The impressions of Sidney M. Logan, pioneer of the Glacier Park country and brother of Major Logan, Glacier's first superintendent, for whom Logan Pass is named.

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The One that Almost Got Away - Evidently even the osprey, skillful fisher that he is, sometimes over-estimates his ability. As I was coming down Logging Lake, I saw one of these fishing hawks swoop into the water. The great thrashing and splashing that followed disclosed the fact that the fish was sorely taxing the strength of the mighty flyer's wings. Several times the osprey was dragged under before rising triumphantly with its catch, a large trout, and flapping heavily-laden to shore. (Nature Notes III, 310) - Elmer Fladmark, Park Ranger

Selfish - DO NOT PICK THE WILD FLOWERS; LET OTHERS ENJOY THEM ALSO read the signs at all tourist centers. Tho regulations forbid and naturalists explain, unthinking or selfish individuals are constantly depriving others of rightful pleasure by picking certain blossoms. On a field trip one morning, the park naturalist was chagrinned to discover the only convenient bear grass flower not only plucked, but cast aside, withered, in the dust of the trail a hundred yards further on. Dr. McLaughlin, naturalist at Sun Camp, writes in the log for his station: "In the afternoon a group of three girls came into the lobby, one with a couple of stalks of hollyhock. I didn't have to ask where she got it -- I knew. It was the only clump along the trail, and subsequent examination proved the premonition correct."

Oiled Trails - Last year, for the first time in history, leading trails in the Park were oiled for several miles from tourist centers as a dust palliative measure. Not until this year was the great good from this move apparent. Principally, the air has remained dust-free and pure for horseback parties which formerly progressed the forest paths enveloped in a choking cloud of dust that dispersed all possibility of appreciation of scenic beauty, floral wealth, faunal interest, and exuberant climate. In addition, the oiling has created additional pleasure for the hiker and economy for the Park budget, which more than offsets its expense. No longer do the trees and shrubs stand drably laden with dust along Glacier's trails. No longer is the purity of the faces of the wild flowers sullied with grime and dirt. Leaf, blade, and bloom appear bright as if after a cleansing rainstorm. Another advantage, oiling has given the trails a coating almost impervious to water, so that run-off after a summer shower is rapid and complete. Quagmires thru which horse and hiker formerly had to wallow are drained quickly and thoroly. Lastly, erosion has been reduced to insignificance.

The crop of young ruffed grouse is simply enormous. These grouse are uncommon in the upper valleys of the Two Medicime District where visitors travel, but are found in great numbers along the boundary trails. - Clyde C. Fauley, Park Ranger

Upon being captured by a C.C.C. boy, a cony reacted to a few minutes of petting by becoming quiet and tame, sitting in our hands without the least bit of fear. - Thos. E. Whitcraft, Assistant Chief Ranger

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GLACIAL DRIFT

NOTES FROM GLACIER NATIONAL PARK

-BEAVER-
CASTOR CANADENSIS

JANUARY 1935

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TILL

Swimming Grizzly - On an August field trip at Many Glacier, the naturalist told his party about different animals that can be seen at the hotel and camp grounds, and narrated noteworthy incidents witnessed by guests in times past. Included were several yarns about bears in Swiftcurrent Lake, especially that of the black bear that gayly disported in the water at the time of a visit by the Secretary of the Interior, in 1929, just when parkmen prayed for happy display and rare occurrence. At dinnertime most of the informed party members were happily surprised by a comparable performance. A huge grizzly made appearance on the west shore of the lake at the Narrows. Across, a fresh dumping of choice hotel garbage beckoned. Without delay, he plumped his huge bulk into the cold water and paddled the several hundred yards to the opposite shore, much to the glee of several scores of spectators on the hotel veranda.

Trained Bear - Many a bear is berated around camp and cabin in the National Parks for raiding garbage buckets and scattering the contents untidily over the ground. The bear that proved the exception appeared at the Granite Park Chalet early in August. He seized the gunny sack full of swill standing outside the kitchen door, dragged it neatly to the garbage dump, there thoroly rumaged thru the contents for tidbits.

Adhesive Nonchalance - Marvelous tales have been told about the climbing prowess of the mountain goat, many of which tax to the utmost the credulity of the listener. On a trip over Lincoln Pass in early September the park naturalist and an assistant watched a solitary billy at close range, as he moved over the face of a particularly bad wall, a part of Gunsight Mountain. Coming to a sheer drop, the goat, scarcely hesitating a moment, dropped his front legs over the edge, thumped his chest against the rocks, leaped, and landed fifteen feet lower on a pinnacle several feet high that had barely enuf apical surface to offer footing to his four legs, even tho placed close together. From a distance the goat appeared drawn to the sharp point like iron to a magnet. There he stuck, for some fifteen seconds, nonchalantly poised like some animal performer on a small ball in a circus arena, until he bounded to the firmer, broader terrain below. The daring leap was made on the rim of the abyss overhanging Lincoln Lake, whose cobalt waters sparkle 3500 feet below.

Sperry Goats - For years goats have been coming almost nightly to visit Sperry Chalets and delight guests by awakening them with the prancing of sharp hoofs on the dormitory veranda. The record number of goats visiting at one time at the Chalets was set one night last June when fifty-seven by actual count disported themselves in a great reunion. (See NATURE NOTES II, 30)

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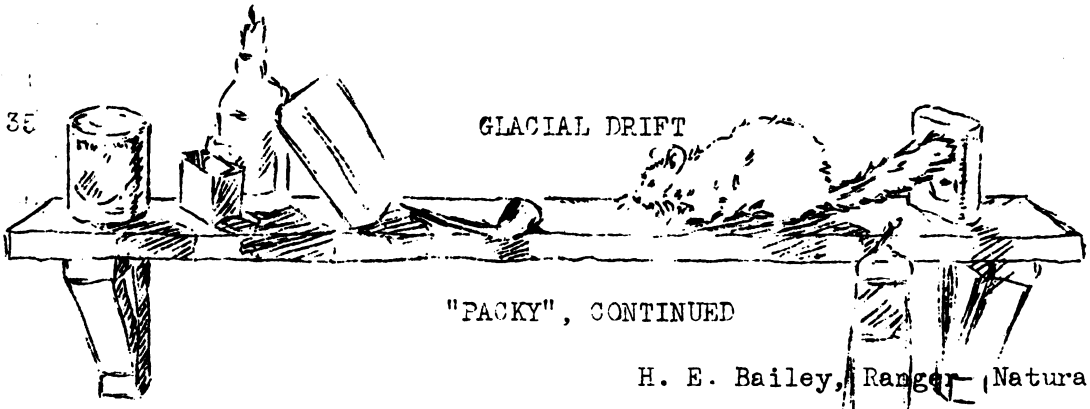

"PACKY", CONTINUED

H. E. Bailey, Ranger-Naturalist

With the single exception of the bear, the pack rat appears perhaps in more stories than any other Park animal. A yarn that never fails to bring a roar at camp fire entertainments illustrates the pack rat's peculiar habit of replacing one object with another, which gives the animal another common name, trade rat. It concerns a pair of newlyweds who tried their hand at making biscuits for the first time. Upon leaving the dining table they returned to find that stones had mysteriously taken the place of the biscuits. Next morning the stones had been reclaimed -- and the biscuits returned.

This inveterate habit is not nearly so humorous when it strikes closer home. Possessing a kindly nature and at the same time having become quite attached to our pet exhibit pack rat, we unadvisadly freed it at the end of last season. Packy promptly took quarters under the museum, and during the long winter made away with every shiny object possible, including some three dozen cut flower label holders. Needless to say, the exhibit rat was painlessly etherized at the end of the past season.

Our caged rat draws a tremendous amount of interest. When alarmed it jumps with lightning speed into the little stone shelter provided for it. But being of a curious nature, its quizzical face is soon poking out thru the opening with an expression that reminds one of a pup who has chewed a shoe and senses his guilt. Whenever excited the pack rat makes a thumping or drumming sound by flatly striking the soles of his hind feet on the bottom of the cage.

There are two pack rat dens in the Many Glacier district, one in the crevices of a limestone ledge on the north side of Swiftcurrent Falls, the other in a small cliff on the west shore of Josephine Lake. Their presence is detected by white calcareous deposits excreted with urine and built up as a white stoney crust often over a millimeter thick. These excreta, mistaken for geological, i.e. inorganic deposits, have often caused much speculation and inquiry among observers who could not fathom their origin.

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SECOND ASCENT OF ST NICHOLAS

M. N. D'Evelyn, Ranger Naturalist

Conquering first the psychological fears of Glacier Park's most formidable appearing peak among several hundred stupendous mountains and secondly the more real challenge of a sheer cliff over a thousand feet high, Dr. R. T. Young and son of Missoula late in August made the second ascent of Mt. St. Nicholas in history. "Saint Nick", as the peak is informally called by all familiar with the stark steepness of its outline, appears far beyond the reach of any mortal. It is a craggy spire topping 9380 feet above sea level, which stands between Park and Coal Creeks in the Middle Fork country. It is a well known landmark to travellers on the Great Northern Railway or on the Theodore Roosevelt Highway.

Alpinists by the score have been lured by the precipitous contour of St. Nicholas, but only one, Conrad Wellen of Havre, had succeeded in reaching the summit (See NATURE NOTES III, 86). Mr. Wellen accomplished the climb in 1926 after several futile attempts. A youthful companion accompanied him about half way.

Dr. Young is professor of biology at the State University of Montana and a former Glacier Park ranger naturalist. The two scaled 3500 feet of underbrush, shale slopes, and naked cliffs in four hours and forty minutes, reaching the top at two o'clock in the afternoon. The route lay by way of Rotunda Cirque on the northeast slope, and the climb termed comparatively easy once the half-way mark was passed. One solid rock wall which presented no hand or foot holds momentarily stumped the pair of ambitious climbers. It was surmounted by one first climbing onto the other's shoulders and then pulling up his partner.

THE PARK NATURALIST STAFF

After the rapid growth made by the ranger naturalist staff in Glacier National Park since 1929, a drastic retrenchment was necessary because of shrunken budgets and an expected travel decrease. Only six of last year's naturalists returned. To these, a seventh was added as special assistant to the park naturalist. Returning this year were Harold E. Bailey of the University of California, J. LeRoy Arnold, graduate of the University of Pennsylvania and now teaching in Southern California, John T. Emlen who receives his doctorate from Cornell University this year, Dr. Willard T. McLaughlin of the staff of Northwestern University, W. Stephen Thomas of Harvard and Louis Wessel of the University of Oregon. The new staff member was Morton N. D'Evelyn, now of Stanford University, who visited the Park with an Eagle Scout Expedition in 1931 and who spent the summer of 1932 on a biological expedition to Costa Rica for Carleton College and the University of California. Like unexpected increase in the Park, the naturalist division served more than ever before: 105,000 attending its services.

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AN ASCENT OF MT. WILBUR

- W. Stephen Thomas, Ranger Naturalist

For three summers the towering rock walls of Mt. Wilbur have boomed over my quarters in the naturalist's tent at the Many Glacier campground. For three summers those precipitous cliffs, golden when touched by the rays of the morning sun, have dared me to climb them and to reach that towering summit. On August 20 of this year, led by "Chuck" Ziering, already the veteran of three successful and two unsuccessful ascents, and in the company of Jim Kinney, of Hawaii, and Pat Nelson, of Minnesota, I looked upon the familiar walls with a new interest. for we aimed to reach the top.

About a mile west of Red Rock Falls we left the Swiftcurrent Pass trail and proceeded up a dry creek bed. Fifteen hundred feet of tumbled slide rock and shale brot us to the dark band of diorite so familiar on the mountains of Glacier Park; and there the stiff scaling began.

One chimney led us fifty feet nearer the top. Following some straight climbing, we were aided by another chimney, but in this one, toes and fingers dug tightly but thinly into the rock were the sole supports. High on the southwest shoulder we looked down on Iceberg Lake, a speckled spot of blue directly below. By a third chimney we reached the northwest shoulder, and there found it necessary to drop two hundred feet into a saddle before we could gain the true summit. The first five hundred feet on the main dome were easy climbing with fine, broken limestone underfoot. We made the cairn at 9293 feet above sea level by 10:45 A.M.

Two containers found among the boulders held the records of previous climbers. One, a match safe, included the earliest listed names: G. M. Kilbourne, 1927, headed the list as Norman Clyde did not sign for his 1924 ascent. Kilbourne and Seethaler have made the climb twice; Warner, thrice; and Ziering, four times.

On the summit I collected red and yellow crustose lichens, and near the top, polemonium, sedum, and saxifraga. (For an account of early climbs, see GLACIAL DRIFT, IV, 62 and 72, 1931.)

Clouds enveloped the mountain and marred our vision during the descent. By the time we reached the last cliff, hail began to fall and continued for an hour. These poor weather conditions made the footing on the rock faces exceedingly precarious and walking in the shale unpleasant and slippery. At 4:00 P.M. we reached the camp grounds, soaked and chilled to the bone but far from dampened in spirits.

Botanists seem to have trouble deciding on the generic name of Devil's Club, as it goes by Fatsia, Echinopanax, Oplopanax, and Acanopanax. All agree on the specific "horridum", however.

- Dr. W. T. McLaughlin, Ranger Naturali

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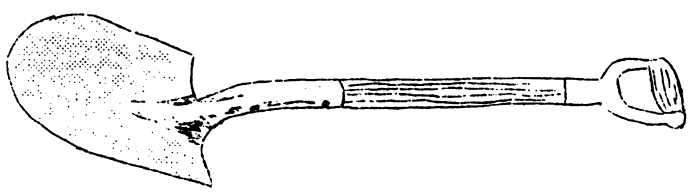
Horace Clark, a half-breed, and myself were the first two that got to the the falls of the Swiftcurrent. I located a mill site and water right. Later I had five locations, some that yielded oil on what is now Park property.

It was not long before the newcomers had sunk tunnels into the shale and limestone. Then their spades were not empty, as today. Altho they found traces of mineral in the form of copper pyrite and some copper ore with cobalt, the ores did not exist in commercial quantities. Today, many a forgotten shaft shows its dark maw in the steep walls of Grinnell Peak, in the slope of Appekunny, and at Ptarmigan and Iceberg Lakes. Attestation of an intense period of mining activity, these abandoned claims are the sole traces of an army of settlers. Their ghost town of Altyn, once having a population of over five hundred, must have been a bustling center on Altyn flats. Now but the faintest vestige of a few cabin foundations remain of this community which once boasted a post office, store, several saloons and dance halls, and even a hotel. The waters of Sherburne Lake, dammed to a higher level, now roll over a portion of the town, whose inhabitants were forced to pull up stakes when Glacier Park was created in 1910.

Mr. Stevenson reminisced further: "The little Ptarmigan Lake I really named, because when I sat down one day to get notes on the boundaries of my prospect some ptarmigan walked across my feet, they were so tame. In 1906 I built a cabin there at the falls below the lake so that I could have a place to live in when I was working on the claim. I ran a tunnel in thirty-five feet on the south side of the lake. I built a cabin at Iceberg Lake in 1899 and did more prospecting there. Near that patch of snow on the north side of Iceberg I had what I called my White Elephant Lead."

Besides these and the small shafts sunk here and there in other valleys, the Cracker Jack mine with its hulk of rotting machinery and dilapidated buildings at Cracker Lake is another testimony of the money and labor expended in a fruitless search for minerals. Here Jim Harris staked his claim; his fellow miners nick-named him "Smooth Bore" because of his facility in conversation. Today the mill is the resort of saddle horse parties from the Many Glacier Hotel, hikers, and the marmots that exact toll from the lunches and the sentiments of the former.



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GLACIAL DRIFT

EMPTY SPADES

W. Stephen Thomas, Ranger Naturalist

Impressed with the white glory of Grinnell Glacier and awed by the rock walls of Appekunny, Altyn, Wilbur, and Wynn, visitors driving into Many Glacier may not at once sense that this recreational center was thirty-five years ago the scene of great commercial activity - a mining rush. Near the close of the last century a stream of prospectors and adventurers lured more by the rumors of vast deposits of copper, oil, and oil shale, rather than by the grandeur of the mountain scenery, poured into this valley.

Even as early as the eighties of the last century, when scientific scouts of the calibre of George Bird Grinnell and Raphael Pumpelly were filling note books with geographic data and before J. W. Stevens had discovered Marias Pass, a few prospectors were unsuccessfully panning for gold along Swiftcurrent Creek. But when others found traces of copper at the head of Quartz and Mineral Creeks, over-eager speculators wanted the territory east of the divide, then a part of the Blackfeet Reservation, to be opened for legitimate occupation. The fact that the Swiftcurrent and Sherburne Valleys were then closed to settlement, however, did not hold back many of the hardy western type. Quite appropriately their contemporaries called these miners "sooners", because they came before the rush.

Little has been written of the dramatic events transpiring during the mining days of Many Glacier. Few are the original settlers who can tell tales of the time when Iceberg Lake could be had for the taking or when one could build a cabin and locate a claim at Swiftcurrent Falls. One of these few is Frank M. Stevenson, perhaps the first to take up residence in the section. His original cabin stood where a single lodgepole pine droops over the highway, west of Sherburne Lake.

The past is far from an apparition when we see it thru the eyes of Mr. Stevenson, who in an hour of conversation can paint the opening of Swiftcurrent valley as a mineral strip.

"I guided the company of soldiers sent to open the area and showed them to the line," narrated Mr. Stevenson. "They were camped at the ranch of "Butch" Henkel, near the present town of Babb. The mountain above Many Glacier Hotel is named for Henkel. The cavalry detachment from Fort Assiniboine had come in to take out the sooners and control the opening of the territory. There were quite a few of these sooners. I took the soldiers in to the boundary on April 15, 1898. There was a lot of snow on the ground, and all of them couldn't get their horses up the hill below the present site of Sherburne Dam.

"At noon the soldiers fired a volley from their rifles, and that was the signal for the rush to start. Just one or two of the cavalry, the lieutenant, and myself were able to get in. Very few of the prospectors got to the line that day, since many streams were greatly swollen with water.

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UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF NATIONAL PARKS, BUILDINGS, AND RESERVATIONS
GLACIER NATIONAL PARK

GLACIAL DRIFT

Volume VI September, 1933 Number 5

A popular pamphlet edited by the Park Naturalist and distributed gratis from time to time by the Educational Department of Glacier National Park to persons and organizations interested in the Park and its natural history.

Eivind T. Scoyen, Park Superintendent Dr. G. C. Ruhle, Editor

"Nature is the Art of God"

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The travel figures in Glacier National Park during the 1933 season were the largest in the history of the Park. The total number of people entering the park this year was 76,615. This figure we found to be 2,839 more than the total for the year 1930, which was the peak year for the Park, or an increase of 3.8%. The total number of cars amounted to 20,483, which was 2,165 over 1930 or 11.9% increase. This year's figures were 23,413 over last year for the number of people entering, or an increase of 44%. This year's automobile figures were 6,333 over last year, or an increase of 44.5%.

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Few Waterfowl - Harry Doust, ranger of St. Mary District, was recently transferred to his former station at Kishenehn, from which he had been absent for two years. One of his first comments upon returning concerns a subject which has alarmed true bird conservators for the past few years, the growing scarcity of waterfowl all over the country. Harry writes: "The absence of bird-life along the river (North Fork of the Flathead) is very noticeable. Four or five years ago there were numerous ducks and loons, and occasional honkers. At times, Kintla Lake would be dotted with hundreds of birds. So far this fall (December 1), I have seen only three loon and nine mallards in the two months I have been here."

Flight - The duck and goose flight over Waterton Valley was strung out over an unusually long period this year. During the last week of November, about three hundred golden-eyes, harlequins, and teal floated about on the lake for two days. Several other varieties were present in scattered numbers. Only one flock of geese was seen on the lake this past month (November).

- L. O. Hanson, Park Ranger

Fish Food - On November 15, I caught eight bull trout (Dolly Vardon) in Logging Lake, whose weights varied between one and one-half to eight pounds. The stomachs of six of these contained whitefish, that of the largest holding a full-grown victim. I noticed swarms of trout fingerlings and sucker minnows in the spot where I caught these fish, so it may be inferred that thru preference or otherwise, whitefish are the principal food of bull trout at this season. The stomachs of two cutthroat trout caught at the same place contained snails and rock worms. - Elmer Fladmark, Park Ranger

Road Closed - The Park Service has learned that it takes more than a prohibitory sign and a barrier to keep people from using a road. Each autumn when snow blocks passage over Logan Pass, a heavy bar is placed across the bridge over Avalanche Creek to protect motorists from going further where danger of rock slides and deep snow is imminent. Despite this, passage is often forced, and many venture beyond often without chains and clothing adequate for the severe wintry conditions of higher altitudes, only to appeal for help to the paternalistic ranger or other park service man who happens to be in the vicinity. Such adventurers would spare themselves and others much misery and trouble, if they would heed the wisdom of the park administrators when they caution, "Road closed."

Banner Year - Glacier National Park signalized 1934 as National Parks Year by overwhelming completely all previous travel figures. 116,965 people entered the park gates, an increase of 53 per cent over 1935, the previous record year, and an increase of 120 per cent over 1932. Meanwhile, 136,000 listened to the lectures of ranger naturalists, or took trips afield with them, or otherwise utilized the personal service offered by them.

Record Cedars - The western red cedar, juniperus scopulorum, is a small tree or shrub found at lowest elevations in the park. Ranger Andrew Fleutsch, on patrol, observed large individuals growing in his Kishenehn District. The circumference of the trunk of the largest living specimen measured forty two inches at the base, thirty-eight inches breast high.

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GLACIAL DRIFT

NOTES FROM GLACIER NATIONAL PARK

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The Logan Pass Indian Ceremony (Continued from page 25) - they smoked and laughed in small groups, still each with his own people, or tried out their horses on the flats. Youths, changed thru contact with white schools, did not feel the tribal isolation of their parents; they intermingled for dashes, mock football scrimmages, or playing catch.

The great ceremony was preceded by a historical and explanatory prologue by the naturalist. Representatives of the three tribes, Two-Guns-White-Calf of the Blackfeet, Bear-Track of the Flatheads, and Loose-Moccasin-Grizzly-Bear of the Kootenais introduced themselves and their people in sign language which was interpreted to the assembled multitude.

Bedizened with fluttering feathers and bedaubed with paint, a mounted Blackfeet war party, with scouts in advance, approached the summit from the east and sighted a party of Flatheads and Kootenais in the west. The scouts advanced alone and placed on top of the Pass a bent stick decorated with eagle feathers, horse hair and tobacco to signify that the Blackfeet desired peace, that they wished to smoke the pipe together, and to exchange gifts and horses. Were the stick straight, pointed, and undecorated, war would be signified. Upon the retreat of the scouts, Flathead and Kootenai scouts approached to examine it and get its message, which they carried to their chieftains. The two parties slowly advanced towards each other, chanting their war songs which were echoed by squaws gathered on the adjacent slopes to watch the proceedings. The leading chiefs hailed each other and conversed together in signs; the braves dismounted and, kneeling, faced each other in two parallel lines and smoked the sacred pipe, passing it from right to left with great solemnity. An exchange of gifts and mounts followed. As a symbol that the three tribes were now at peace forever, and that a new route of communication had been opened between the lands of their ancestors, the Blackfeet passed over the highway into the territory of their former enemies; the Flatheads and Kootenais advanced into the land of the Blackfeet.

Upon returning to the Pass, the tribes held a great feast of celebration, beginning with the Grass Dance. The zest with which they threw themselves into these was well exemplified by one Flathead brave, stripped naked except for a cincture about his loins, a leather vest, and circular fan of Chinese pheasant feathers dangling in the rear from his belt. His bare skin was painted bright yellow and streaked with red. He stamped and caricoled, whooped and simulated all the postures of actual fight with such frenzy and vigor that he would cast himself exhausted on the circle of benches that had been put around the dancing site to keep back the whites. Within a few minutes he would pull himself together again, tense and quivering with emotion, and would dash back among the weirdly gliding forms long before breath was again coming evenly and smoothly.

In council among themselves that evening, the three tribes decided that they had had a great and profitable time. They desired to meet on peaceful terms again next year with all of their former adversaries: Nez Perces, Crows, Sioux, Assiniboines, Gros Ventres, Snakes, Stonies, Crees, Sarcees, Kainah, Siksikas, Arapahoes, and Cheyennes. They would hold a great tribunal and the park naturalist should again be in charge of their ceremonies.

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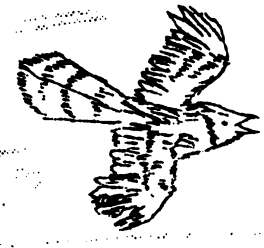
UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
GLACIER NATIONAL PARK



GLACIAL DRIFT

Volume VIII April, 1935 Number 2

A quarterly pamphlet edited by the park naturalist and distributed gratis by the Department of Research and Education of Glacier National Park to persons and organizations interested in the natural history of the park.

Eivind T. Scoyen, Park Superintendent Dr. G. C. Ruhle, Editor

"EVERY YEAR IS A NATIONAL PARKS' YEAR" (F. D. Roosevelt)

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SILVER ANNIVERSARY

On May 11, Glacier National Park celebrates the silver anniversary of its creation. In 1910, President Taft signed the bill which links this great Northland realm of mountains, glaciers, lakes, and waterfalls with Yellowstone, Yosemite, and Mount Rainier, a befitting jewel of rare beauty in the diadem of National Parks which are the crowning glory of the United States of America. This issue of GLACIAL DRIFT is dedicated as the silver anniversary number.

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THE CRAZY GRAY HORSE

E. T. Scoyen, Superintendent

Two years ago while examining exhibits at the annual Blackfeet Indian fair at Fort Browning, Montana, I noticed the outline of a figure of a horse cut from a thin board, no doubt the side of an apple box. After the artist had completed his whittling he had painted the figure a deep gray. As I was about to pass the exhibit with no more than a casual glance, a venerable Indian, Chief No Coat, walked up to my side and started to talk to me. As I could not understand his language Dick Sanderville took over the job as interpreter.

"Do you know anything about that horse?", I was asked.

Of course I did not, as it appeared that some school boy had made it as part of his school work. The Judge then told me the story which, as nearly as I can remember it, is as follows:

Sixty years ago there was a very famous horse among the Blackfeet known as the Crazy Gray Horse. Whenever a battle started within the range of his sight, hearing, or smell he promptly headed for the scene. His charges were always straight to the middle of the fight. No warrior was ever able to hold him back. As the judge remarked with a twinkle in his eye, "Many warriors became famous for their daring in battle as a result of riding the Crazy Gray Horse, but that didn't mean much as they had to go where the horse did whether they wanted to or not".

In three years the horse was in many fights mostly with the Sioux. During this time warriors riding him were able to capture 92 enemy guns, a tremendous achievement, for we must remember that even in defeat Indians were especially careful to retrieve all of their guns. It became that the enemy fled whenever they saw the gray horse headed in their direction, for they believed him possessed of an evil spirit.

About 1857 a band of seven Blackfeet were hunting in the Sweet Grass Hills far to the east of Glacier Park. Altho they were in enemy country and were armed only with bows, a few arrows, and knives, they felt no fear, for their great warrior horse was with them. The Sioux had been waiting for such an opportunity; the little Blackfeet band was attacked by one thousand hostile warriors. Nevertheless, the seven were able to stand off the overwhelming odds for the entire day, so potent was the medicine of the Crazy Gray Horse. But in the end they were all overpowered and killed. The horse met the fate of a great warrior and died on the field of battle.

For many years thereafter there was an organization among the Blackfeet known as the Crazy Gray Horse Society. Its membership was limited to men of outstanding courage in the tribe; actually it was what we might call an honor society. It no longer exists.

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Perhaps Judge No Coat detected doubt in my face as he told the story, especially when he told the circumstances and details of the last battle, for he remarked, "If you don't believe this don't blame me or call me a liar. I am only telling it to you the way it was told to me. His statement is repeated for consideration by the reader.

AN EARLY TRIP INTO GLACIER PARK

William Veach, Sr.

Early in April 1876, I was a member of a party of five who left for the northern Rocky Mountains on a prospecting trip. The others, excepting one whom I no longer can recall, were: Emerson Brown from Arizona, who was interested in the timberland of the Northwest, and who had charge of the outfit; "Blackie" Crow, a prospector, also from Arizona; Thomas Moloniex, the interpreter, guide, and scout for the party, who had been in this country before and who spoke the Blackfeet language. I was cook for the party, and killed the game. We never took advantage of the abundant game that inhabited that part of the country, but killed only what was necessary to live on.

Our party, departing from Fort Worth, Texas, selected a route toward Denver, Colorado. We planned to use the latter city as our main supply post but had to alter our course to escape bands of hostile Indians. Thus it took us one and one half months to reach our destination and our supply was running low.

Leaving Denver, we traveled north for Cheyenne, Wyoming, and without stopping, proceeded to Red Lodge, Montana. Near Red Lodge we experienced our first difficulty upon meeting a band of hostile Blackfeet Indians*, supposedly on their way to join in the battle of the Little Big Horn. Brown discovered the Indians while spying around with his field glasses during the morning. By the time we broke camp the Indians were well upon us, and a running fight ensued which lasted until sunset, when we arrived at Red Lodge which consisted of a trading post, a few cabins, and tents. After taking on necessary supplies such as flour, pepper, and salt, our previous course was resumed toward what is now called Glacier Park.

Our party forded the river between Upper and Lower St. Mary Lakes which was very high and swift at that time. There was an abundance of fish in these lakes. An Indian camp was located on the north side of the lower end of the upper lake. The inhabitants included only old bucks, squaws, and children, as the young braves had gone to the Little Big Horn**. The first night after crossing St. Mary River, we camped on the lake shore five miles above the outlet. A trapper's cabin consisting of two crude but comfortable rooms stood fifty yards from the lake shore.

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of passable ground. In some sections rockmen have tugged on rope ladders anchored to vertical cliffs to bite their way into solid rock, soon to harbor a trail. Frequently in these descents the workmen have taken a sixty pound jack-hammer or a fifty pound case of dynamite and have gone to work on ledges where a fall means a non-stop drop of 500 to 2000 feet and certain terminus at the "Happy Hunting Grounds". Have you ever watched a worker bouncing around as he rides a chattering pneumatic drill? Can you imagine him doing the same while perched on a precarious ledge with a yawning abyss below?

Other feats are packing compressors and similar heavy equipment many miles into construction locations. This is done by mules trained to carry heavy loads in dangerous and narrow places. Building bridges over swift and icy streams, often many feet below the trail, is another problem which taxes the ingenuity of the engineer and skilled artisian who cannot call upon reinforced I-beams or suspension cables for construction aids.

Of the many engineering feats of trail building of particular importance are those to be found near Gunsight Pass, Triple Divide, Ahern Pass, and Ptarmigan Wall. Compressors, jack-hammers, dynamite, and human skill have played a part in conquering these dangerous passes and making the Park more accessible and comfortable for the tourist. Expense has been heavy, these bypaths of pleasure often costing from $2500 to $3000 per mile. This figure does not include upkeep, which each year matches a considerable portion of the original cost. Men and horses have given their best so that the trails might be satisfactory for even the most timid tourist.

Probably as spectacular and as difficult as any trail undertaking has been the Ptarmigan Wall tunnel. Built for the purpose of connecting the Belly River country with that of Many Glacier and to eliminate the long and tiresome trip over Red Gap, this tunnel will stand as a monument for future generations. 185 feet thru the hardest strata in the Park, 7500 feet above sea level, and over 75 miles from the nearest railroad, this work dazzles the imagination of even the most conservative. This undertaking cost in the neighborhood of $4000 and has made it possible for the hiker to look down a sheer 1000 feet to Elizabeth Lake, which feeds the Belly River. From its south portal Mount Wilbur, Mount Gould, Going-to-the-Sun and other magnificent peaks may be viewed.

The newly constructed trail over Gunsight Pass is another marvel of engineering science. Following the time-worn trail that was used by the Blackfeet and Kootenais for centuries on their hunting trips, this frequently travelled ribbon of wonder dodges snowbanks and overhanging cliffs to the crest where can be seen snow-clad glaciers clinging to the peaks, and lake-studded valleys divided by reflecting waterfalls.

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If the Indians had come upon us that night we should have seen twice as many as there really were. In the latter part of August we reached Quartz Lake. A few days later Crow found his largest gold nugget which weighed thirty ounces. He found this nugget at the waterfalls directly northeast of the lake. Now we knew our permanent camp must be located here. Leaving Crow at the place, Moloniex, Brown, and I went back after Mr. X. The round trip took us nearly a week.

Assembling at Quartz Lake, we started the construction of a one room cabin, situated on the northeast corner of the lake. Winter descended on us after we became settled. Brown now informed us that he was going to California for supplies. Crow intended to remain all winter with Mr. X at Quartz Lake, while Moloniex and I decided to go with Brown. Our party started out about the latter part of September during a heavy snowfall.

We headed toward Grange City and reached there about the middle of October. Without stopping, we continued on to California. The weather was very cold and deep snow made traveling difficult. We had planned to go by boat down the Columbia River, but Brown decided to see the sequoia country of California, so we continued on horseback. We traveled across the Sierra Nevada and down the west side slope of these mountains to San Francisco, reaching that city about the latter part of December. Brown paid Moloniex nine hundred dollars, based on seventy-five dollars per month for a year's service altho we had not been on the trail a year. I received four hundred and eight dollars. We remained in San Francisco for a few weeks, enjoying city life once more.

When Brown went back he was completely outfitted. We bade him goodbye and Moloniex and I went by horseback to our homes in Texas. I never saw anyone except Moloniex of the party after that. Mr. X had two burros loaded with fur at the time Brown, Moloniex and I went to California, but I suppose he had considerably more upon his departure from the park.

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* Apparently not Glacier's Piegan Blackfeet, but rather Sihasapa Sioux, also called Blackfeet, and unrelated to the former who are of Algonkian, not Siouian stock. ** This is questionable. - Ed

The Author - Some time ago a letter came to the park from G. Veach of Sicklerville, New Jersey, with the information that his grandfather had hunted in the park region nearly sixty years ago. A request from us brot forth the above interesting narrative, which, except for minute details, can be accepted without question. Mr. William Veach was born in Texas in 1860, and was a husky lad of sixteen, six feet tall, when hired by Mr. Brown as hunter and cook for the party. In the winter of 1882, he served with the U. S. Marine Corps at Fort Assiniboine. Further information reveals that Crow was a tall, slim half-breed Indian, 38 years old. Moloniex (also spelled Molonioux and Mollinex) was almost six feet tall, and forty years old. Mr. X was a lean man of 35, whose name, as closely as Mr. Veach can recall it, was Slade, Sloan, or Slater.

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SIDELIGHTS ON TRAIL CONSTRUCTION

Joseph Walters, Engineer

The majestic range of mountains comprising what is known as Glacier National Park was little known to the white man of a hundred years ago. But with the coming of such men as Grinnell, Tinkham, and Monroe, the American public evidenced an interest in the terrain, the fauna, the geology, and the wild life of this virgin and scenic area.

Realizing that this wonderland, if it were to remain in its natural state, must be protected, Congress set aside 1534 square miles as a national park in 1910. The next step was to make the many lakes and glaciers, the beauty spots of this mountain wilderness, accessible to the traveller. A well-planned trail program was inaugurated, and today there are approximately 1500 miles of horseback and foot trails penetrating all sections of the Park.

During the summer months it is possible to visit most of the sixty glaciers and 250 cirque lakes nestled among the mighty peaks, but they can only be reached by use of the trails. Conveniently located camps and chalets make it possible for the person with a spark of ambition and a reasonable love of nature to amble or ride horseback thru one of the greatest natural wonderlands in America. Many travellers spend weeks exploring the passes, fishing in the sky-blue lakes, and enjoying the sunshine and healthful recreation so prevalent in the vacation land.

All these opportunities have been made possible by the wisdom and foresight of National Park officials. Trails have been planned for the safety and comfort of the tourist. Grades on the main trails have been limited to fifteen per cent, and alignment has been planned so as to eliminate switchbacks and snowdrifts wherever possible. Particular attention has been given to locating the trails where the most magnificant country can be viewed, and where the impression is most lasting.

Behind this program of trail construction lies the vision of the engineer, the wisdom of the executive, and the perseverance and toil of the workman. Tedious reconnaissance surveys have been projected, forbidding obstacles have been surmounted, and almost impossible locations have been planned. Obstacles little dreamed of by the layman have fallen before the ingenuity of the engineer: vertical cliffs have been crossed by half-tunnels with rocks and crags overhanging; walls have been built along narrow ledges, twisting lake shores, and shifting talus slides; and even moving glaciers, offering their resistance to the inroads of man, have been conquered.

Visualize, if you can, engineers with clinometers for determining the grade and flagging for marking the route locating or aligning a difficult section of trail, or workmen hanging by ropes over sheer cliffs or standing on ledges of rock less than a foot wide to pioneer the first section

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The first known reference to a possible international use of the two parks was made by the late Senator Penrose during a debate on the Glacier Park bill on January 25, 1910 when he told the Senate , "This park will be international in character".

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In the 25 years since its creation in 1910 a total of 867,940 people have visited Glacier National Park. There is hardly a country on the face of the globe which has not sent at least one representative to Montana's great wilderness.

Aside from the first two years when things were being started the low mark was established in 1918, the war year, with 9,086. From this date to 1930 there was a steady increase to 73,776. Depression years caused a decrease to 53,202 in 1932. The record was set during 1934 with 116, 965 visitors. During the silver anniversary year of 1935 it is estimated that 180,000 people will visit the park.

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The entrance registers to Glacier National Park contain the names of many people of international fame. However, at no time in the history of the park, or any other park, has such a large group of distinguished persons passed the park gates as during 1934. Heading the list was President Franklin D. Roosevelt and his party, who spent August 5 making the trip over the world renowned Going-to-the-Sun Highway, and visiting other points in the park.

Only three of the western National Parks have been honored with a presidential visit- Yellowstone, Glacier, and Zion.

****

Seven men have held the position of Superintendent of Glacier National Park during the 25 years of its history. In addition 4 others have served as Acting Superintendent during times when there was a vacancy in the superintendent's position.

The first to hold the job was Major William R. Logan, whose brother Sidney is a well known lawyer residing in Kalispell, Montana. Mr. Logan took charge of the park on August 8, 1910 and was active until his death on February 7, 1912.

Other superintendents with the dates of their service are:

James L. Galen, Dec. 1, 1912 to Aug. 5, 1914.
Samuel F. Ralston, Aug. 6, 1914 to June 18, 1917.
Walter W. Payne, Aug. 16, 1917 to June 30, 1920.
J. Ross Eakin, May 12, 1921 to Jan. 8, 1924.
Chas. J. Krabel, July 1, 1924 to Feb. 25, 1927.
J. Ross Eakin, April 11, 1927 to Jan. 15, 1931.
Eivind T. Scoyen, January 16, 1931 ----------.

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In the above list Mr. Eakin served as Superintendent of Grand Canyon National Park in Arizona between his terms of duty at Glacier.

From May 16, 1912 to November 30th of the same year Robert H. Chapman of the U. S. Geological Survey served as Acting Superintendent. Prior to 1925 Henry Hutchings served several periods in this capacity as has Robert R. Vincent since that date, and George E. Goodwin for a few months in 1917 and 1920. Until 1920 selections of the Superintendent and most of the other park officials was on strictly a political basis. At present all regular positions in the park are under the Civil Service.

In reviewing administrative problems in Glacier National Park during the past 25 years it is doubtful if any of the park superintendents have found themselves in a "hot spot" comparable to W. R. Logan, the first man to hold this position, when he took over his duties on August 8, 1910. In a report to the Secretary of the Interior Logan stated, "Shortly before I reached the park and assumed charge as superintendent forest fires broke out in various portions of the reservation,and immediately upon my arrival I devoted my attention to fire fighting. My entire time was taken up in checking them". Not only in the park but thruout the whole Northwest, 1910 is remembered as the worst fire year in history. With meagre equipment, practically no trails or roads, and no trained organization Mr. Logan was faced with a discoureging problem. During that terrible summer about 100,000 acres in Glacier were burned over.

During 1934, when severe drought and high temperatures brought about the worst conditions since 1910, a total of thirty seven fires burned over only 232 acres in the park. Detection systems, organization, equipment, and transportation for fire prevention and supression have been greatly improved during the 25 years of park history.

Altho[illegible] nearly three million dollars will have been spent on the road system in Glacier National Park when it is completed the total mileage of modern highway in the park will be but 70 miles. In addition there are 65 miles of secondary road all of which were built prior to the establishment of the reservation.

Due to the extremely rugged topography road construction is a very expensive item in the park's development program. Along the Garden Wall approaching Logan Pass on the Going-to-the-Sun Highway costs reached a hundred thousand dollars per mile. However, these expenditures have resulted in a road thru the heart of the park which all world travellers pronounce the most spectacular and scenic on the globe.

In addition to roads in the park the Blackfeet Highway which skirts along the east boundary from Glacier Park Station to the Canadian border, a distance of 48 miles is under the jurisdiction of and maintained by the National Park Service.

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The summer of 1936 will see the opening of the spectacular short-cut from Glacier to Watertown Lakes National Park in Canada. Leaving the Blackfeet Highway a few miles north of Babb, Montana, the road follows a north-westerly direction direct to the village of Watertown and virtually halves the distance between these two points as compared to the old route via Cardston, Alberta.

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Facilities for the accomodation of visitors to Glacier National Park represent an investment of approximately two million dollars. More than three fourths of the total amount is devoted to provide lodging and meals for guests by the Glacier Park Hotel Company. The Glacier Park Transport Company operates a fleet of seventy five busses and passenger carrying vehicles. The Park Saddle Horse Company owns eight hundred horses and is the largest company of its kind in the world. J. W. Swanson of Kalispell provides boat service on most of the larger lakes.

By the end of 1935 there will be nearly 1,000 miles of trails in Glacier National Park. One half of these are in regular use by park visitors during the summer months. The remainder are used principally for patrol and fire protection purposes.

The report of the Superintendent for 1911 gives the total trail mileage of 146 miles as being in "fair condition".

Fishing in the streams and lakes of Glacier Park have been maintained during the past 25 years by the planting of 27,000,000 fish mostly trout and grayling. In addition land-locked salmon were planted in St. Mary's Lake in 1932. A fish hatchery has been in operation at Glacier Park station for a number of years to supply the needs of the park. However, greatly enlarged facilities are needed, and an estimate for a new hatchery lay-out to cost $70,000 has been submitted by the U. S. Bureau of Fisheries. It is hoped that this item will be included in the new Public Works program.

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Thru an Act of the Montana Legislature approved February 17, 1911, the Federal Government has exclusive jurisdiction over lands in Glacier National Park. All laws both state and national which apply in the park are enforced by the park ranger force of 19 men. The government employs a resident U. S. Commissioner who is authorized to hear evidence and inflict penalties for violation of the various park regulations. Procedure is much the same as in the average justice court.

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An interesting event of the year 1916 in Glacier National Park was a six weeks horseback trip through the park by Mr. Harold L. Ickes then a lawyer of Chicago, Illinois. Mr. Ickes did not return to the park until 1934 when, as Secretary of the Interior, in charge of the administration of all National Parks, he made the trip with the President's party. In a

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shall stand on the climax of this glorious route in memory of the far-seeing genius of Stephen T. Mather. Emblazoned in lasting bronze are the words - "Stephen Tyng Mather July 4, 1867-January 22, 1930. He laid the foundations of the National Park Service, defining and establishing the policies under which its areas shall be developed and conserved for future generations. There will never come an end to the good that he has done."

THE LOGAN PASS INDIAN CEREMONY

G. C. Ruhle, Park Naturalist

Fortune has favored few white people to be witness to the pageantry, blazonry, and solemnity attentant to certain significant events of aboriginal history, especially those of intertribal nature, such as peace pacts. Astride the Continental Divide which parts its waters thru the tortuous course of the Columbia to the Pacific and thru the Plains-bounded Saskatchewan to distant Hudson Bay and hemmed in by craggy mountains, rugged and forbidding as those in fantastic prints, and wildly in harmony with the aborigines who prowled thru their fastness, representatives of the Peigan (Blackfeet), Salish (Flathead), and Kootenai tribes, inveterate enemies in days of the buffalo, congregated to seal a pact of peace and to celebrate the frindliness that has long existed between them. It was a day and an occasion already notable for several reasons: it honored the memory of the father of the National Park Service, Stephen T. Mather; it observed the first anniversary of the International Peace Park; it marked the opening of the Going-to-the-Sun Highway, the only transmountain road within the wilderness of Glacier National Park. History in the making was staged before the eyes of almost five thousand spectators, gathered primarily for the dedicatory opening; they departed, chanting the praises of the spectacle which chance had brought to them.

When early in the year a ceremony to open the new highway was discussed, it had been suggested that a few Indians be assembled for color to smoke the peace pipe and to dance. The matter was presented before the Indian councils, where it took an astonishing turn. In the days when buffalo blackened the Great Plains with their numbers, the Blackfeet, feared and hated, roved as masters of the headwaters of the Missouri. Back of protective mountain ruggedness dwelled the Flatheads, Kootenais, and other tribes that ever sallied forth on the expanse of plains to collect their share of meat and hides, and to wage incessant and desultory warfare against the Blackfeet. Not since 1868 had the pipe of peace passed between the head chiefs of the three tribes tho the fires of hatred had long since been dulled and quenched by the passing of the buffalo and the ascendancy of a newer generation. Here was opportunity presented to assert the peace that had been lasting and to confirm the friendship that had grown with the years. The three tribes agreed among themselves, quite independent of Park or Indian Services, to smoke the pipe not in sham but in all the earnestness and sincerity of their departed ancestors.

Not even the dire misfortune of an accident to a truckload of Flatheads which snuffed out two lives could diminish the ardor with which the Indians entered upon what they considered their hereditary duty. To the

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MOVIES

Ben C. Miller, Park Ranger

On March 23, Assistant Chief Ranger Croghan and I had opportunity to study a marten at close range, and to have him perform for us at the Coal Creek Snowshoe Cabin. I had thrown out of the cabin door two loaves of moldy bread and some pieces of moldy ham. Ever ready blue jays and camp robbers gathered immediately for a feast, and we watched them as we prepared supper. At dusk they vanished, leaving most of the food uneaten. We were waiting for the stew to finish cooking when a violent rattling started in the gunny sack of emptied tin cans hanging outside the cabin door.

"There's my marten now in the can sack," I explained to Charlie.

Charlie slipped across the room, cautiously opened the door, and thrust his head outside. Suddenly he jerked it back, as if something had hit him.

"What's the matter?" I asked.

"He was a lot closer than I thought, and as he bolted out of the sack, he swished his tail across the end of my nose," Charlie replied.

We went outside and looked around; there were plenty of tracks, but the marten had vanished, and with it the bread and meat. How a marten can drag off a pound and a half loaf of bread without leaving the slightest trace of doing so was a mystery; the flashlight revealed no signs of dragging whatever.

I threw out another piece of ham and watched with the flashlight. To our surprise, the marten came out of its hiding, apparently not at all disturbed by the beam of light. Charlie said he would like to try to get a motion picture shot, so we hung out the gasoline lantern for illumination. A slice of ham tied to a stake ten feet from us set the stage.

In a short while a bright-eyed head was poked out of a hole and turned this way and that, the keen nostrils scenting the air. Satisfied, it pulled forth a sleek body after it, and the beast sat there awhile. All at once it dashed over and up the stake, pounced upon the meat, and started a plunge back to its hole. A snap of its head by the securely tied meat stopped it short. This didn't discourage him; he began to chew on the meat with snarls and growls. Then he tried a variation of climbing up the stake, down the other side, and tugging in that direction. Still the meat held. Again frustrated he started chewing on the meat in a businesslike manner so that one certainly would not think that he had made away with two loaves of bread and a quarter of a pound of ham such a short time before.

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atmosphere of adventure and unexplored wilderness even to their very names. To the east and south, the great paragon of Going-to-the-Sun Mountain, a corner of the emerald of St. Mary Lake, hemmed in by Red Eagle, Little Chief, and Citadel, and finally and abruptly, the endless plains.

Dropping down the east side the road is soon margined by a dripping snow bank, trouble for the crew that must shovel eighteen or twenty feet deep to reach the road bed in the spring, but all summer the delight of visitors from tropical and sub-tropical climes.

The engineering masterpiece and construction achievement of this transmountain highway is met at a second tunnel, this one over four hundred feet long. Two thousand feet of perpendicular rock necessitated the hewing of a new trail from Logan Pass to reach the site, the carrying of cumbersome tools and materials down over a hundred feet of rope ladder, and the initial use of archaic hand equipment. Probably sixty per cent. of the material removed for the highway was solid rock, but the supreme challenge to the ingenuity of the engineers was met with the boring of this tunnel.

From the tunnel the road drops quickly into a forest again, and skirts spectacular St. Mary Lake to terminate by joining the Blackfeet Highway that parallels the Park's eastern mountain face. Contrasts add greatly to the interest of this eastern end of the transmountain highway. Its forests of spruce and Douglas fir, so characteristic of the mountains fringing the Great Plains, differ widely in appearance and composition from the luxuriant vegetation of McDonald Valley with its cedars, hemlocks, and western white pines. Ahead, the grassy plains billow to a purple horizon, with, perhaps, a chuck wagon or lone shepherd and flock topping some rise.

If the reverse drive is made, proceeding from east to west, an entirely new set of views will greet the motorist, who is advised to make the trip in both directions, if possible.

These fifty-two miles of unexcelled mountain scenery are a lasting tribute to Stephen T. Mather who, as first Director of the Park Service, took the lead in advocating the construction of the transmountain road. His bold prediction of 1919 asserted, "It is doubtful if any other road in America can in the same distance unfold ... such a grand array of beautiful forests, dashing torrents, wonderful gorges and valleys, towering cirques, and a vista of bold needle-peaked mountains and serrated escarpments which are found in our northern Rocky Mountains ... "

In the early summer when winter snows still whiten the peaks, a month later when the golden glow of myriads of blooms follow in the wake of the melting banks, in the fall when the scarlet and yellow of the mountain ash and maple run riot on the shrubby slopes, a plaque set in a huge red boulder

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TILL

Early Crop - It is generally known that mountain goat kids are born in late April or May. Ranger Ben Miller was surprised to see two young kids on February 27 frolicking on a ledge a thousand feet above him in Upper Park Valley. "At first I thot I must be mistaken; I watched thru a pair of eight-power binoculars. When, however, I saw them nursing, I was convinced that they were kids, despite the early date". He saw one of them again on February 28.

Reservation Moose - Seldom are moose seen east of the Continental Divide in the park region. Three wandered out of the park, their tracks appearing on Hudson Bay Divide near the highway. Several Indians immediately started to hunt them, but the animals had vanished. It is reported that a sadder fate awaited two other moose that moved ten miles below the park boundary on Cutbank Creek, for they were quickly killed by reservation hunters. As food is plentiful, no doubt these grand animals would soon establish themselves in numbers along these river bottoms if they were given even a few years to do so. - Thomas E. Whitcraft, Chief Ranger

Sic Transit Gloria - In February, when bull elk are about to shed their antlers, they withdraw from the main herd and bunch up by themselves. Evidently an inferiority complex seizes them, or like the man who has just had all of his teeth pulled, they loathe having the females see them minus their antlered glory. - Ben C. Miller, Park Ranger

Deer Feed - There are probably about seven hundred deer in the Logging District, of which I counted 483 individuals in February. All thru that month there was a good crust on the snow, and one would expect that they would scatter out for food, but instead they lingered closer than ever to the feedyard. The result: I fed almost four tons of hay to them during the month. - Elmer Fladmark, Park Ranger

At Play - On the sixth of February, I noticed an unusual number of coyote tracks on Logging Ridge, all leading in the same general direction. Proceding with extreme caution, I discovered a coyote sitting on a log. He was deeply interested in something outside my vision. As the wind was in my favor, I successfully crept up very near, suddenly to see a most home-like scene. Two small pups were tussling and rolling over each other, while a third sat enrapt nearby. When finally the one became tired and winded, the winner and watcher took up the contest. Nearby two other mature coyotes were gorging themselves on a freshly killed fawn, while a doe, perhaps the mother of the fawn, stood a short distance away, also deeply interested in what was going on. For ten minutes, I watched and gradually drew closer. Suddenly the first coyote bolted off to the woods, having apparently discovered my presence, and all of the rest followed. - Elmer Fladmark, Park Ranger

Two Medicine elk browse very little, but keep fat on the abundant bunch grass on the valley floor. - Clyde C. Fauley, Park Ranger

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THE GOING-TO-THE-SUN HIGHWAY

M. N. D'Evelyn, Ranger Naturalist

Rising from the softness of evergreen forests to the boldness of serrated peaks, displaying an untold wealth of mountain splendors thru-out, Glacier Park's two and a quarter million dollar Going-to-the-Sun Highway climaxed a decade of construction with its dedication on July 15. Already thousands have been soul-stirred by the brilliance of its mountain meadows, the glisten of its snow banks, the glitter of its dashing falls, and the grandeur of its far-flung panoramas into the fastnesses of America's most rugged, most tumultous mountain range.

From Belton to the summit on the west side the motorist rises thru four thousand feet of untrammeled wilderness. Leaving the forested shores of expansive Lake McDonald the route follows the meandering course of McDonald Creek, a foamy torrent rushing in a gorge of red argillite boulders, a quiet brook rippling over a bed of water-worn pebbles. Breaking the long avenues of towering trees are slopes swept clear of timber, the yellow green of their shrubby growth sharply delineated against the deeper color of forest as yet escaped from the irresistable avalanche.

The long six per cent grade begun, the highway plunges into the sombre shadow of a tunnel. One of the superb views of the Going-to-the-Sun Highway is framed in the rocky irregular outline of a window of this tunnel - that of the monumental Heavens Peak, ever capped by shining banks of snow.

After making a switchback the highway is almost immediately shelved on the face of a perpendicular cliff. There the Herculean task of hewing this road bed out of solid rock becomes apparent. The careful observer will note, still dangling from the trees overhead, the ropes that had been used to lower workmen down the cliff for setting the initial charges of dynamite to blast out this right of way. Nearly one pound of explosives was necessary for each cubic yard of material removed.

The great pageant of peaks towering overhead, opening with Brown and Cannon and gaining pitch with the Garden Wall, Haystack Butte, and Mt. Pollock, reaches a glorious climax on the Continental Divide at Logan Pass with its host of alpine splendors. Precipice bordered and aptly named the Hanging Gardens, luxuriantly green, mossy meadows, dotted here and there by clumps of stunted timber line trees and carpeted in the spring by golden glacier lily blooms, stretch to the shale slopes of surrounding peaks. A short walk reaches small Clements Glacier with its chasms of transparent blue ice and its pyramidal stretches of moraine, or takes one for a view of Hidden Lake, a gem of turquoise set in a steep-walled cirque a thousand feet below. A look to the horizon from a hundred places rewards with a panorama of sublime grandeur. To the north and west, range upon range of blocky, snow-capped peaks - Kipp, Trapper, Anaconda, Cathedral, Vulture, Guardhouse, and Kootenai - steeped in an

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Obituary - Several of Glacier's old timers succumbed during the hardships of January. Frank Geduhn, who settled at the head of Lake McDonald in the early nineties, passed away in California on January 10. He was followed by his neighbors of many years, Mr. Frank Kelly on January 15 and Mrs. Frank Kelly on January 16. The aged couple were stricken with pneumonia in the snow bound cabin, twelve miles from the nearest doctor. It was only after a heroic struggle with plow, caterpillar tractor, and snowshoes that assistance could be brought to them in their forest home.

In January, a snow slide off Double Mountain killed eight bull, six cow, and one calf elk.

A meadowlark appearing in the barn at Polebridge in early March succumbed to a bitter cold snap in early April.

Ranger Croghan reported that on his late spring inspection trip he observed deer in isolated areas away from feedyards in much better condition than those loitering around and subsisting on hay at feedyards.

In March alone Ranger Fladmark fed 8.7 tons of hay to whitetail deer made dependent upon man by years of feeding and starving because of overgrazing and artificial concentration in small areas.

Bear or their signs were first seen this spring as follows: by Ranger Newberry at Road Camp 8 on March 11; by Ranger Miller below lower Park Creek snowshoe cabin on April 29; and by Ranger Peyton at Grinnell Lake on the same day, April 29.

Apparently at Two Medicine coyotes kill few snowshoe rabbits, tho they dine quite frequently upon them. The big owls kill great numbers of rabbits, leaving the backs and hind legs for the coyotes.
- Clyde C. Fauley, Park Ranger

Ranger Best reported otter in Midvale Creek, in which they have never been reported before.

Again cottonwood trees around Goathaunt Chalets had to be protected with wire and screen from felling by beaver. The fine birch grove around the camp also had to be carefully watched to keep it from despoliation by these busy creatures. - L. O. Hanson, Park Ranger

Richardson ground squirrels have been out of hibernation at Duck Lake since the middle of February. - Arthur R. Best, Assistant Chief Ranger

The first geese to return to the park's eastside were several white ones which were promptly shot by an Indian who was nearby. The Migratory Bird Act is not observed on the Reservation. - Clyde C. Fauley, Park Ranger

Buttercups in full bloom appeared on the meadow bordering the north shore of Upper St. Mary Lake as early as March 18. - Elmer N. Ness, Park Ranger

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PLACE NAMES
of Glacier National Park and Vicinity

64. BROWN MOUNTAIN (8541 feet) - In the summer of 1894 William Brown, of Jacksonville, Illinois, the General Solicitor of the Chicago and Alton Railroad, upon the invitation of his personal friend, Mr. F. I. Whitney, General Passenger Agent of the Great Northern Railroad, took a party of friends on a hunting and fishing trip to Lake McDonald. The party left Chicago on July 25 and reached Belton on the 28th. They spent the greater part of August in camp at the mouth of the stream now called Snyder Creek. Shortly before breaking camp two of the party, Mr. Charles H. Russell and Mr. Frank A. Johnson, climbed the mountain back of camp. In honor of Mr. Brown, the leader of their party, these friends called the mountain, then unnamed, Mt. Brown. The name was immediately accepted by the residents about the lake and by the Great Northern officials who thereafter placed the name on all railroad literature and maps. The name was already firmly established when I first visited the lake in 1898. When the region was surveyed in 1900, 1901, and 1902, the geographers and topographic engineers found the name in general use locally and they placed it upon their maps; it has since appeared uniformly on all government maps of the region. In due time it was approved by the National Park Service and the Board of Geographic Names. - L. O. Vaught

65. BROWN PASS (6500 feet) - Brown Pass is probably named for Louis Brown, an early settler of Montana, who married a Flathead squaw and became identified with that tribe. Louis Brown, I understand, lived near Waterton Lake, and was in no way connected with the Mt. Brown above described. - L. O. Vaught

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GLACIAL DRIFT

JULY 1935

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UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
GLACIER NATIONAL PARK

GLACIAL DRIFT

Volume VIII July, 1935 Number 3

A quarterly pamphlet edited by the park naturalist and distributed gratis by the Department of Research and Education of Glacier National Park to persons and organizations interested in the natural history of the park.

Eivind T. Scoyen, Park Superintendent Dr. W. C. Ruhle, Editor

"EVERY YEAR IS A NATIONAL PARKS' YEAR" (F. D. Roosevelt)

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Our recreation spots with their wild life and fish depend on forests and streams. Both are destroyed by fires. Help prevent fires and preserve our great outdoor heritage.

****

Again the skillful hand of Fireguard Merritt Johnson (GLACIAL DRIFT VII, 2, 8) adds an artistic touch to the pages of DRIFT. To Mr. Johnson goes thanks for contributing so generously of his time during a busy fire season.

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A NATURE SONG

B. A. Thaxter, Ranger Naturalist

"Ursus" was a little Bear that would not mind his maw;
She'd cuff him and she'd spank him and she'd slap him with her paw;
He'd go out nights and prowl the camp and steal all that he could,
Till some rangers caught him in a trap and taught him to be good.

The Cony is a Pika sometimes called a little hare
He has no tail on his behind, in fact not anywhere;
He lives high up in rock slides and he's busy every day,
For he works from morn till dewy eve a-cutting of his hay.

Mephitis is a little Skunk that has an awful smell;
How very very bad it is I'm sure its hard to tell;
But should you see him stamp his feet and elevate his tail,
You would better hold your nose and run and do it without fail.

"Whistler" is a Marmot who lives high up in the rocks;
He never has to comb his hair or change his shoes and socks;
When summer comes he eats a lot, until he gets so fat,
He can sleep ten months with no more grub. Now what do you think of that?

"Porky" is a Quill Pig who has spines upon his back;
He's not afraid of man or beast and never fears attack;
When foes appear he drops his head and sweeps his tail about,
And fills them full of stinging darts that never will come out.

Sometimes you'll see a little Bat that flutters thru the air;
He's feared by some who still believe he'll get into their hair,
But that's the bunk. Yet do we know who see him in the sky,
That he is the only mammal that can really, truly fly?

The pretty Flying Squirrels you may never, never see;
Their nest in which they sleep all day, is in a hollow tree
Tho you may see them in the air, they cannot really fly
And mount on wings like birds and bats from earth up to the sky.

"Felis" was a Cougar and a devil of a Cat;
He preyed upon the deer and birds and sometimes caught a rat.
The animals all feared him, and looked on him as a thug,
Till a hunter shot and skinned him, and then used him for a rug.

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WILD FLOWER STUDY IN GLACIER NATIONAL PARK
III. The Decalog for Biological Studies

William Gould Vinal

1. Thou shalt not worship graven textbooks, definitions, the recitation, subject matter, or established forms. Rather that there be educative experiences, open-mindedness, judgment, much discussion, and growth. The student and not the subject is the center of departure.

2. Thou shalt approach the outdoors trustingly. Shun all irrational thinking. Believe what you see. Use your eyes, ears, nose, touch, and taste to gain information. Be slow of judgment. There is no room for supernatural intervention. The fear of bears, wolves, and snakes has been created by man in his own mind.

3. Thou shalt avoid undue slothfulness of hand or brain. Leisure time is here. Nature recreation to keep the mind and body employed is building morals.

4. Thou shalt not hunt, kill, wound, or capture. Thou shalt build fires with much caution. Thou shalt leave nature unspoiled that others may enjoy it. Thou mayest hunt with a camera.

5. Thou shalt intergrade the potency of laughter and play. Excessive seriousness is dullness. Don't be too serious about the need of knowing adventitious buds; reticulated or netted-veined leaves; whether it is a corymb, spadix or panicle; or whether it is a dehiscent or indehiscent fruit. The passion for jig-saw puzzles or having a good time on a flower trip may not be so irrational as it seems.

6. Propose to keep thy body at its best. Intellectual botany is one-sided. Some botany classes are run as tho the students are going to act as botanists and not as educated people. Hiking botany is as practical as table botany. If we leave out significant elements we are neglecting our opportunities. There is simple clothing for a hike. It is not sinful if we do not sit quietly at a laboratory table.

7. Thou shalt not bear false witness. Too many believe that four-leaf clovers bring good luck; that bears eat bear grass; that bear grass is a kind of grass; that mountains are usually an upheaval; that a mountain range is a ridge; etc., etc. Let them know that the mountain ash is an apple and the dog tooth violet is a lily. Let them demand to be "shown things" like the famous gentleman from Missouri. Are we using the best environment and experiences? All are honest as to the need of conservation.

8. Thou shalt not lose faith in the intellectual. This is an age of faith in the potentialities of Glacier National Park. Everyone should have the opportunity to explore his powers.

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A DEER PROBLEM

Fred H. Dale
Resident Wildlife Technician

There is a serious difficulty in interpreting observations on wild animals, because of the human tendency to favor preservation of certain forms of life considered especially valuable. For this reason it is well to introduce a report of this nature with an explanation of the differences between wildlife management in a national park and game management as a commercial venture.

It is the stated policy of the National Park Service to permit animals to carry out their struggle for existence unaided, as being to their own ultimate good. In other words, a national park is set aside as a bit of wilderness where animals may form their normal ecological groups and react to the forces of nature in their own way without interference from man. In such a scheme all animals must have natural controls to expansion, and in general there is a balance between reproductive rate, and loss from natural causes. It can easily be seen that any significant interference with this balance causes a fluctuation in population. Man has practically exterminated many game animals over large areas by increasing the mortality factor thru hunting. In order to adjust the balance, he has attempted to reduce other natural controls such as predator loss, starvation, and disease, not with the primary hope of saving animal life but usually that man may play the role of arch predator and have the lion's share of the game. In the national park, however, man has handed his rights back to the forces of nature, so these other controls must of necessity operate to a greater extent than in areas outside the parks.

Studies carried on during the winter by rangers, and directed by the park wildlife ranger and the resident wildlife technician, have outlined the winter range of the larger game animals within the park, and have been making an attempt to discover what trends are present in game populations and what controls are acting to keep numbers within a satisfactory limit. To sum up the results of the study in a brief report, it must be said that deer are still increasing in Glacier National Park. Unfortunately what deer reside in the park are forced to concentrate in relatively small areas, where snow conditions are most favorable.

In these concentration areas there are deer in such great numbers that a great portion of normal food has been depleted, and less palatable forage has been resorted to, much to the disadvantage of forest reproduction. Fir has been eliminated as reproduction over large areas, and lodgepole pine has been severely attacked in concentration points. Spruce offers the most resistance, largely because of its low palatability, but even this tree is modified in a few areas. Nearly all trees small enuf to be available have been grazed until their normal growth is greatly endangered.

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Nature has gone part of the way in meeting this situation by removing a number of the surplus animals. Rangers diagnosed the causes of death of two hundred ten park deer last winter. It is seldom possible to be sure of the cause of death, even when the animals are examined by a specialist. Animals dying from various causes are eaten by predators. Rangers used their own judgement in these cases and reported the most likely cause of death from shortage of palatable food.

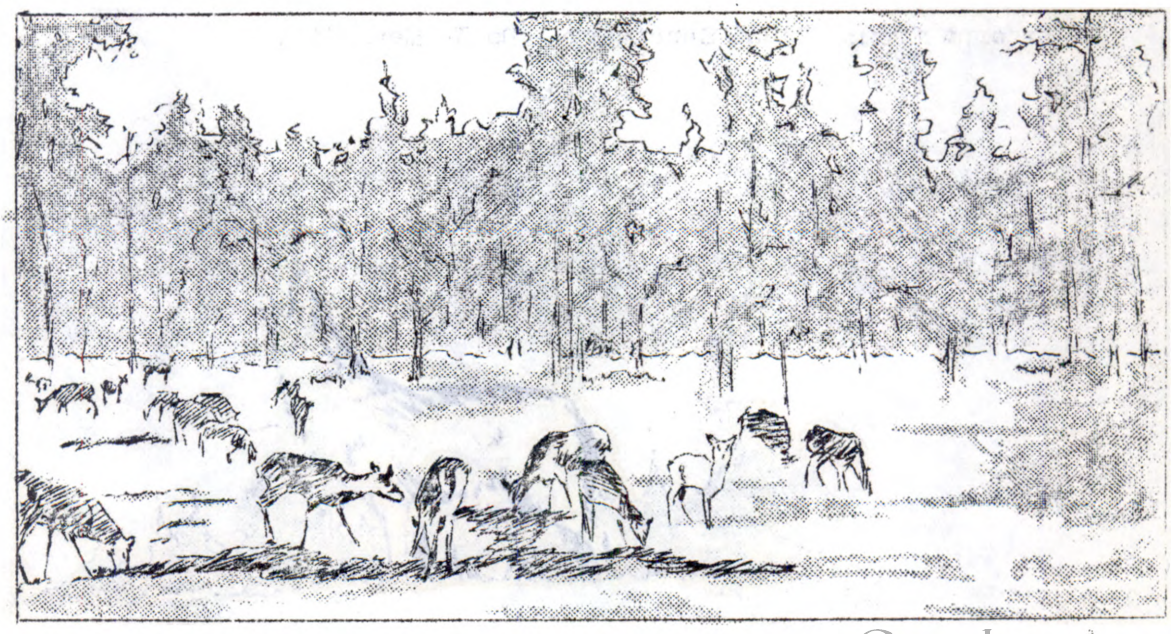
Shortage of palatable food is evidently the greatest factor at the present time, as some fifty-nine per cent of the animals investigated were reported as dying from starvation or disease. No symptoms of disease or abnormal parasite infestation could be discovered so it is probable that the food factor is the primary one as the cause of death.

Predators were forced into second place by a wide margin, having accounted for only twenty-eight per cent of the animals investigated. Eleven deer, or five per cent, were reported as dying from accident, and eight per cent were reported under causes unknown.

It must be remembered that there is no real problem in the loss of normal numbers of deer in a national park, in spite of the feelings of those who would make nature less cruel, or of sportsmen who resent the loss of game to shoot. The problem is to prevent the increase of deer herds beyond the capacity of ranges.

The game counts this year show an increase of deer over last year, so it is evident that we have not yet reached a point where losses can balance the gains. When artificial feeding can be abandoned, and the spread of deer becomes once more unhampered by mans activities, it is possible that this concentration in limited areas will be avoided to some extent, thru migration to more favorable winter range. Until this can be accomplished, it is essential that some deer be eliminated, preferably by natural forces, until the ecological balance can be established and our forest reproduction preserved.

Scene in a feed yard at Logging



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UNITED STATES
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GLACIAL DRIFT

Volume VI July, 1933 Number 2

A popular pamphlet edited by the Park Naturalist and distributed gratis from time to time by the Educational Department of Glacier National Park to persons and organizations interested in the Park and its natural history.

Eivind T. Scoyen, Park Superintendent Dr. G. C. Ruhle, Editor

"Nature is the Art of God"

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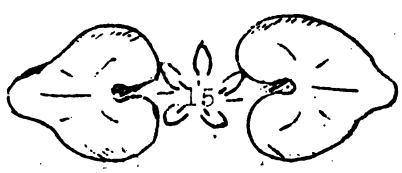
On August 9 the National Park Service ceases to exist after a score of years of administration and preservation of America's most sublime scenic areas. It becomes a part of a new bureau, the Department of National Parks, Buildings, and Reserves. Needless to say, this executive order strengthens the position of the Park Service, long proven an efficient and dependable branch of the government. This date also terminates the long record of public service of Horace M. Albright, who succeeded Stephen T. Mather as the second Director of the Park Service. Mr. Albright's untiring devotion as Director will be missed, but he assures that his active interest in the Park Service will continue thru membership in the foremost conservation societies in the country. Arno B. Cammerer, a tried veteran as present Assistant Director, will succeed Mr. Albright as the first Director of the new bureau.



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THE MEASUREMENT OF GLACIAL RECESSION

M. N. I'Evelyn, Ranger Naturalist

Under the pull of gravity, a glacier slowly flows down its course to the place where its forward movement is balanced by the melting of ice. The position of the ice front is not fixed, but advances during the months of greatest accumulation, that is, during winter time, and retreats gradually at the time of maximum melting. Besides this annual fluctuation, in a growing ice age, a glacier will gradually extend further down its valley as it grows, while in a waning ice age, the ice mass retreats further and further up the mountain side. Glaciers of the world are in general gradually diminishing in size.

In order to know the amount of recession that is going on today, the termini of four glaciers of Glacier National Park are among the ice fronts of North America whose positions are annually reported to and recorded by the Committee on Glaciers of the American Geophysical Union. Early in fall annually, the Park Naturalist makes a survey in the park, tho trips for the purpose are often made difficult or even frustrated by smoke of late forest fires, heavy early snows, disagreeably dark cold autumn days, or other natural agencies. Trips are made as nearly as possible to the time of earliest heavy, permanent snowfall in order to establish their positions just before they are buried.

In the measurement of glacial recession the procedure used in the park is to locate markers, usually piles of boulders, on opposite sides and close to the front of the ice. By sighting across these markers a line of reference for the measurement of the advance or retreat of the terminus of the ice is secured. Actual figures are obtained with a steel tape. The use of photographs taken across the markers makes possible a permanent pictorial record of the annual positions.

Trips have been undertaken annually since the markers were set in the fall of 1931. It is significant that the results have been parallel for the three glaciers on which at least two successful determinations have been obtained--Blackfeet, Sperry, and Grinnell: 1931-32 was a period of general slight advance. The winter of 1932-33 was one of unusually heavy snowfall which caused a considerable downward flow. 1933-34 was marked by unusually light snowfall and an unusually long warm summer; all three glaciers showed recession. It is predicted that 1935 measurements, following a year of moderate winter snowfall, of cold, late spring, and of a wet summer, will indicate little change over the 1934 measurements, tho a general recession will probably be recorded.

The western lobe of Blackfeet Glacier, resting in the col between Blackfeet and Jackson mountains, is part of the largest glacier in the Park, total area considered; it is reached by a side trail leading from the Gunsight trail near the foot of the lake. This is the sector visited for measurements and designated by the Park Naturalist as the Siksikaikwan Lobe, after the tribal name of Jackson who was a Blackfeet Indian. Between

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Crows and Eagle - Eagles and great hawks are often viciously attacked by crows and ravens; these latter, in turn, are routed by smaller assailants, the kingbirds and blackbirds. A pair of crows feel that my station grounds are their particular domain, not to be intruded upon even by that king of birds, the golden eagle. During the heavy snowfall on April 8, a golden eagle alighted on the rail fence in front of the house, only to be harried impetuously by the resident pair who made vicious dives to drive him from his perch. Their daring sallies swept nearer and nearer the foe, who sat unruffled in his regal dignity, disdainful at first of such menial opponents. Finally the eagle would venture a vicious snap now and then as a crow would approach too closely, but he clung to his unwelcome perch till the attackers grew weary of the game and flew to the tops of neighboring pines to await his voluntary departure. - Elmer Ness, Park Ranger

On May 24th a pair of the brilliantly feathered wood ducks rested from their long migratory flight in the Two Medicine River.
- Clyde Fauley, Park Ranger

Birds nesting near Lubec station on June 1st included blue birds, swallows, meadowlarks, robins, sparrows, blackbirds, kingbirds, grouse, catbirds, mallards, teals, gadwalls, and golden eyes.
- Hilbert O. Krause, Park Ranger

Cold-benumbed Insects - While on a trip to Sperry Glacier, Ranger Naturalist Louis Wessel observed the large variety of insect life -- beetles, bugs, moths, butterflies, flies -- stranded on the snow and ice, apparently benumbed by the cold of the upper atmosphere.

Park Ranger Fauley makes note in his May report of his first sight of mountain sheep in the meadow above the Two Medicine Ranger Station.

On April 28 Ranger Buchanan saw twenty-two snow geese in the North Fork of the Flathead River near Polebridge.

There are two moose which have fed regularly with the deer at Nyack feed yard. - F. X. Guardipee, Park Ranger

Bobbing among the chunks of ice in a small lake near the Looking Glass, a grizzly reminded Ranger Clyde Fauley of the photos he had seen of polar bears.

Unusual Tree Growth - Tree growth this season, especially in the lodgepole pine, is very noticeable. The actual growth is about nine inches so far, and no doubt will be much more before the growing season is over. The same luxuriant growth can be seen in the flowers and grasses.
- Hilbert O. Krause, Park Ranger

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GETTING DINNER

E. T. Scoyen, Park Superintendent

During the early evening of June 11, while fishing near the lower end of Lake McDonald my young son and I noticed three western grebes (hell-divers) swimming in the lake. As we approached within about a hundred feet of one of them, it dived. A few seconds afterward a huge bald eagle soared gracefully forty feet overhead. When two hundred feet beyond us it suddenly dived into the lake. It came up with what we thot at first was a fish, but soon observed as the nearest grebe.

The eagle carried its victim for a distance of about four hundred yards. Not being able to ascend high enuf to clear the timber along the shore it dropped its load back into the lake. The grebe seemed stunned for a short time but soon swam away as if nothing had happened.

The eagle perched in a tree for a quarter of an hour and then made another foray over the water. It dived at each of the three grebes in turn and then flew back to his perch. This was repeated several times. At last, it soared out over the water, and picking out one of the birds, kept hovering over it. Everytime the eagle struck, the bird dived below the water. As soon as it came to the surface the attack was renewed. This must have continued for twenty minutes. We were not able to observe the final outcome as the contest shifted far out into the lake. My guess is that the eagle got his dinner.

1935 RANGER NATURALIST SERVICE

To carry on a naturalist program the following men have returned to Glacier National Park to serve as ranger naturalists for the 1935 season: J. L. Arnold, Dr. W. T. McLaughlin, Robert Nelson, and M. N. D'Evelyn. New men on the staff include J. L. Dyson of Cornell University, J. S. Garth of the University of Southern California, H. D. Michener of the California Institute of Technology, B. A. Thaxter of Yale, and Julian Vogt of the University of Colorado.

Heading the list of changes over previous seasons is the removal of the Many Glacier Museum from tent quarters to the lobby of the new ranger naturalist dormitory. Among the exhibits are those of past years. A splendid set of four oil paintings by former ranger naturalist Eugene Kingman of Yale University is being exhibited for the first time in this park. These cleverly combine art and geology. New campfire circles have been constructed at Sprague Creek and Avalanche Camp Grounds. New self-guiding trails are being installed on the Garden Wall trail from Granite Park and the trail to Trick Falls. The regular services on Logan Pass, boat services on Swiftcurrent, Josephine, St. Mary, and Two Medicine Lakes, lectures at Lake McDonald and Many Glacier Hotels and at Sun Chalets, and campfire programs at Avalanche, Two Medicine, and Many Glacier Camp Grounds are offered as during last year.

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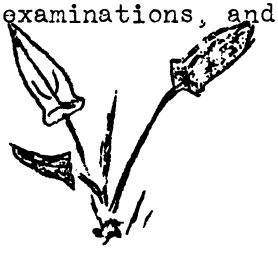
from the openings. It is here that the brilliant paint brushes, senecios, arnicas, bear grass, and fairy bells burst into flower early and fruit quickly. The saxifrage plants, or "rock breakers", add a dash of color to the sombre cliffs. It is the foraging ground of the bighorn sheep, mountain goat, conies, Columbia ground squirrel, ptarmigan, crossbills, and white-crowned sparrows. Mountain top biology is a direct result of climate and not altitude. The wind swept Hudsonian zone rapidly loses its moisture. It is extremely cold at night and surprisingly hot under a mid-day sun. Even the most careless observer sees the difference.

Perhaps you begin to experience mountain intoxication. The cool, pure air makes your whole being vibrant. You are possessed to get to the arctic-alpine peaks. The higher you go the more remarkable the plants become. You are arriving at Glacier's million acre garden with a garden wall half a mile high. Here is the flower pageant of Greenland and Baffin Land. You see the tundras of Alaska. You see how things once were from New Jersey to Puget Sound. You get a picture of plants following the retreating glaciers. You can look across to other peaks with their islands of Arctic plants. You begin to understand how heath and heather could be stranded on Mount Washington in New Hampshire. You get to the jagged edges of the mountains and precipitous slopes where you rest often and longer. You reach out and touch golden lichens. They are rock plants that can grow where moisture and soil is scarce and the sun glares and the nights freeze. Before you are miles of blue gentians, yellow buttercups, and dwarf willows. Here is matchless beauty and vivid color. The plants don't spend time in growing tall but put all their effort into color and seed, producing the most brilliant bee pasture you ever saw. It is no use to list them and you would not care to read if we did.

In a day you have traveled thru as many flower bedecked zones as tho you had walked to the Arctic. The garden walls have scarcely any soil on them. When you gazed at them from the Chalet you received no hint of their floral wealth. You scarcely dreamed that the glorious colors of sunset on the mountain slopes were partly due to lichens -- golden, red, and gray. And as you sit in the fast falling shades of the garden wall you little realize that you are becoming infected with the call of the mountains that will surely return like spring fever, and that will increase in value as years roll on. This early experience will prove to be a real bank account which will be drawn upon thruout life. Such a mental reservoir will stand in good stead in days of stress to come. The beauty and truths of science, the saga of plant life in succession, adaptation, and survival are yours on a scale that can inspire the most sluggish apathy. You have a depth and breadth of understanding that goes far back into the past, which will last longer than a week of final examinations, and which no depression can take from you.



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EDITORIAL PAGE

THE CONQUEST OF THE WILDERNESS

The greatest charm of Glacier National Park lies in its rugged inaccessibility and splendid solitude. One feels very near to the heart of the place as one treads or rides the trails with each vista gradually changing, with ample time and opportunity to be gladdened by the beauty of bush, vine, and flower, by the song of bird and hum of bee, by music of wind and stream, by form of cloud and mountain, by fragrance of forest and meadow, by the confiding nature of the wild folk. Ever so often, one visitor more imaginative and original than his fellows leaves the beaten trails to climb to some unknown meadow or lakeside, to bring back a glowing story of the beauty of an unspoiled nook, a beauty which once spread thru the whole area before trampling feet, grazing stock, stench of gasoline, roar of motors, and noisome chatter of great throngs wiped out much of the primitive. Everywhere one reads or is told of the "lure of unbeaten trails," and how much more fascinating Many Glacier, or Logan Pass, or Two Medicine was when the park was created; yet, with splendid inconsistency we hasten to "improve" and "develop" more and more--with ever broader and straighter speedways, with ever increasing denuded spaces for camping and parking, with ever growing belts of scarred, burned timber as the result of carelessness and ignorance. Isn't it about time that a cry arises of "Halt! Caution Ahead!"? Isn't it time that more careful consideration be given each "improvement", to factors such as scars on the landscape, the death of plants and trees, the destruction of homes and home-sites of wildlife, the upsetting of the balance of Nature, the diminution and destruction of the primitive?

There was overheard in a hotel the other day, a conversation to the effect that Glacier Park had never received its share of appropriations in the past, that there should be built hundreds of miles of roadways in the park to take everybody everywhere in the park in order that everyone might behold the glory of unspoiled wilderness. If lack of funds has prevented further desecration of our park, then those who love Nature can raise thankful paeans for past slight. When one considers the cost of the Going-to-the-Sun Highway in terms of the great gash along the side of the once unscarred Garden Wall, of the dead trees that crowd the roadway on either side, of landslides and loss of primitive charm, of animal lives lost daily thru man's craving for speed, a thotful being may well wonder whether the tremendous price can ever be justified.

I have before me a picture of the Many Glacier Region taken in 1911. A deep unbroken forest stretches from timberline to timberline, for then Swiftcurrent Valley was a densely wooded area like the Belly River, Cutbank, Red Eagle, and other undeveloped valleys on the Eastside. Even when the hotel was built, it was scarcely visible from the lake, tho the shore is only a score of feet away, so dense was the stand of timber on the little intervening strip of land. Today not a tree remains, and the vast sections around the lake are all but completely denuded of attractive forest cover. Similarly in the old camp ground area, where once stood a fine virgin forest of spruce and fir, scarcely a shaded campsite remains--some trees have been cut, some burned, but the vast number have died thru trampling which chokes

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the tender soil fungi that spread thru the thin soil and feed the tree rootlets; the rest have succumbed before the onslaught of fierce winds, as protective barriers have been destroyed so quickly that individuals and colonies could not readjust themselves to the change. Other developed sectors have suffered similarly to the Many Glacier Region.

Let those who, clamoring for the opening of the last primitive valleys of the park, for Belly River, for the Kintla and Quartz regions, for the Flattop area, well remember that the charm of many places rests in their solitude and inaccessibility, that if Boulder Pass were as accessible as Logan Pass, it would be scarcely any more desireable. Let those who consider accessibility and ease alone weigh carefully which gives more enduring recollection, the dash over Logan Pass or the horseback or foot trip over Indian Pass, and learn that one appreciates in more lasting measure those things which one must gain thru the expenditure of effort. Let those who urge more roads well bear in mind that the marring of countryside does not end with the construction of a broad, two-lane highway, absolutely safe when driven at a sane speed commensurate with the full enjoyment of a National Park, but that even the gentlest curves must be eliminated, the width ever increased, each reopening a wound to leave a more gaping scar, with no more turns with delightful surprises beyond, for there are to be no turns: only greater speed and safety, tho we may well note the irony of the latter in mountainous regions where improvement always has resulted in more fatalities. Let us too recall the hundreds who dash daily over Logan Pass, without so much as a stop, or the great number who continually are like the camper from the Atlantic seaboard who boasted he had just been in three National Parks on that day and would be in Mt. Rainier on the morrow!

Despite the thousands of burned acres fringing our park, despite the areas denuded for man's improvements, despite the yellow slash across the virgin side of the Garden Wall, Glacier Park still contains some of the largest unspoiled mountain wilderness in our country. It has always been a trails park, and much of its attraction has been due to this fact. The aged and the infirm, as well as the lazy and the hurried, have been given a grand opportunity to see one of the finest of Glacier's mountain passes from comfort in an automobile. Let us stop here and be done with further rape of pristine beauty. This is addressed to those who understand the Park Service and its purposes less, yet who constantly clamor for greater exploitation. The Park Service in general, the utility operators, the majority of true lovers of Nature and the Park do not wish further development. Why must there be a constant giving in to further and further desecration?

Visualize the future of the Park. Will the national parks a hundred years from now be what we might wish them to be? We who administer must bear in mind that the direction and operation of the Park Service is a big job demanding big men--who in succeeding generations should deserve not the finger of scorn but admiration and a feeling that "there were giants in those days". In the days when the service was small and appropriations light, the task was easier. Great crowds bring greater popularity, wealth, and power, but have made more difficult the vision of the noble fundamentals and principles which started the Parks on their career. Let all who love Glacier bend every effort to keep it forever our greatest Wilderness Park.

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TILL

Inviting Trouble - Once to be seen only after stalking in the wilds, bears now patrol the Going-to-the-Sun Highway of Glacier Park, much to the delight of the tourists and the consternation of park officials. One incident was reported by Ranger Ray Newberry. A bear walked up to the car, stood up on its hind legs, and surveyed the driver at close range. Then there was no danger. "But after a moment the driver reached out and slapped the bear across the nose. Altho the bear did nothing after being struck, the driver certainly invited trouble." Others will not be so lucky.

Grazing Bears - Bears have never been classified as grazing animals, but I found two of them eating grass like cows in front of the station during May. Bear food was still scarce in the woods, and the only green spot in the district was at the station. - Lou Hansen, Park Ranger

Lake McDonald Pet - For nine years known to hundreds of park guests as the pet white-tail deer of Lake McDonald Hotel, Fanny was again the object of interest and sympathy last month. Behind the Hotel in the enclosure which has been her maternity ward for the past half-dozen years, Fanny gave birth to a tiny fawn, but half the usual size and reputedly the smallest new-born deer ever seen in the Park. Later in the day Fanny severly gashed her abdomen while attempting to clear a barbed wire fence. A surgeon was summoned, the lakeside lawn of the Hotel became a temporary hospital, and two dozen stitches were required to close the wound. On the following morning the weakened Fanny gave birth to a second fawn. It lived but a few seconds, the first offspring Fanny had ever lost at birth. The tiny fawn born the day previously also died before the second day had passed.

Coyote Cunning - A large female coyote has often been observed during the past month along the highway between park headquarters and Apger. The time of her appearance varies considerably, but I have seen her most often between eight and nine o'clock in the morning soon after traffic has become heavier and next often during the slight lessening of traffic around the noon hour. Having noticed that she seemed rather disinclined to leave the road, even at the approach of an automobile, and finding her for the third consecutive morning in the same area, I began to observe her more closely. By doing so I found she was gathering the freshly killed Columbia ground squirrels which had been run over by automobiles, and were lying on the highway. By doing so this animal , which evidently is the mother of a rather large family, is saving herself considerable labor, time, and exertion necessary to run down or stalk fresh meat for her family, and has shown quite keen judgment in making the best of a situation, which,at least to a coyote, is rather unusual.

- C. L. Croghan, Assistant Chief Ranger

While on a trip to the Cameron cabin on the upper part of Boundary Creek I counted five mountain sheep. To my knowledge this winter is the first time that sheep have been seen in this section.

- Lou Hansen, Park Ranger

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Cracker Lake Marmots - Two marmots at Cracker Lake seemed to ignore the usually accepted idea that animals will fight, if necessary, to gain sole possession of food. Two of the latter had darted for a slice of buttered bread that lunching hikers had thrown to them, and had reached it at the same time. To the surprise of the onlookers, no fight took place. The marmots immediately began to eat, working slowly towards each other from opposite sides. The hikers complimented the animals on their fine sharing spirit, but too soon! for when just one thin strip of bread intervened between their jaws, the fight began. - James L. Dyson, Ranger Naturalist

Patient Grouse - A Richardson's grouse has made her nest under a small log twenty feet from the station barn. She has posed for her picture several times, besides receiving the daily attentions of the CCC boys of the spike camp, who pass within six feet of her when going to and from work. Her worst threats are a crow that uses a tree nearby as a perch and a sparrow hawk that sits on the ridge of the barn almost directly over her. So far she has successfully concealed her presence from them. She hatched five chicks from six eggs on June 29. - Hilbert Krause, Park Ranger

Bark Beetle Flight - The evening of June 10, 1935, I noticed hundreds of small insects flying thru the air near the woodshed at the rear of my residence at headquarters. Specimens examined were identified as Douglas Fir Beetles (Dendroctonus psuedotsugae). So far I have been unable to locate any trees near the scene which show evidence of an attack. Two years ago I observed a similar flight in the same place, and no Douglas Fir near the house suffered any damage.

- E. T. Scoyen, Park Superintendent

Sprague Creek Flight - On the evenings of June 21 and 22 the Douglas Fir Beetles swarmed into the Sprague Creek camp and attacked 14 trees, just about all the remaining Douglas Firs in that area. A snap decision would indicate that they were in for a heavy infestation of beetles this season. However, the winter of 1933-34 provided an immense number of windfalls as ideal host material for both fir and pine beetles, and observations indicated that these conditions were fully utilized.

- Charles L. Croghan, Assistant Chief Ranger

Cascading Moraine - Sexton Glacier, nestled on a shelf high up on the north face of Going-to-the-Sun Mountain, is an excellent example of a cliff or cornice glacier; it is hemmed in by a towering rock wall in the rear, and the front of the ice rests along the edge of a cliff rising high above the head of Baring Creek. At several places the ice is so close to the edge of this wall that there is no room for morainal material to accumulate, so it is spilled over the edge to form a huge talus cone in the valley below. Such a feature might aptly be termed a "cascading terminal moraine". - James L. Dyson, Ranger Naturalist

Melting snows revealed an unusual accident this spring, as I found a dead mink in the tunnel of a pocket gopher. The mink had evidently burrowed after the gopher, had found that the frozen ground made further advance impossible and then that retreat was also impossible. The evidence indicated a terrific struggle. - Clyde Fauley, Park Ranger

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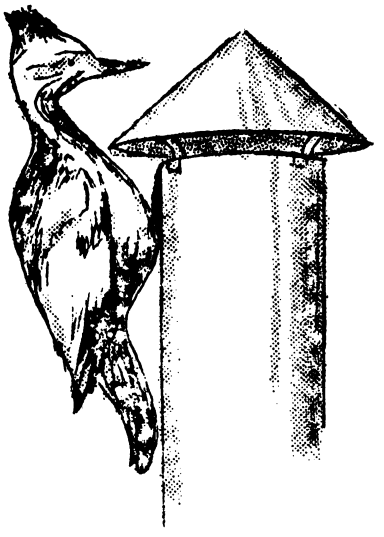
Pet Owl - A great horned owl, believed to have been brought from Idaho when C.C.C. Camp 1 came to the Park in the spring of 1934, has made the Belton mess hall its headquarters during the present spring and summer. At the whistle of cook Glenn Montgomery, the owl will swoop out of the trees nearby to be fed raw beef by hand. During daylight hours it will cock its head quizzically but is apparently unable to distinguish objects more than a foot or two ahead of it. One afternoon the owl permitted Montgomery to bring it out of the dark woods into the open sunlight to pose agreeably for a photo. It has become so accustomed to man and its adopted surroundings that it remains perched on the gong outside the messhall door while the flunky rings the first call in the morning. Despite its hand fed diet of beef, the owl has not given up its natural food of small mammals, and the gopher population around headquarters is diminishing as a result.

Nesting Pipit - On July 14 I found a pipit's nest under a clump of white dryads on a rock slide above Preston Park. The five eggs which it contained were not deserted by the female, until I had nearly stepped on her. Glacier Park, with the highest portions of the Rockies and the Arctic regions, is in the nesting range of the American pipit. It winters in California, Nevada, Gulf States, and south thru Central America.

- James L. Dyson, Ranger Naturalist



Broadcasting Woodpecker - At the head of Lake McDonald we have a woodpecker who has done his contemporaries one better in advertising his presence during the mating season. Usually a dead snag or telephone pole serves as a sounding board for the hammering bill of the male, but this particular individual makes use of an iron chimney cap and thereby broadcasts over a much larger area. Each morning at daybreak he is on the air with a rat-tat-tat which sounds not unlike Morse Code. Tho I have not yet been able to understand his language and while I am hardly elated at having such a noisy neighbor, I do greatly admire his power and technique. "By gar she got hard nose".

- Ray Newberry, Park Ranger

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GLACIAL DRIFT

NOTES FROM GLACIER NATIONAL PARK

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OCTOBER 1935

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Age Challenges Youth - On returning from Upper Park Creek on February 14, I came across an old mountain goat fast asleep on a log at the uppermost crossing. I holloed to awaken him; he looked up, batted his eyes a few times, stood up, and stared. I tried to scare him, but goats are not easily frightened. At last he climbed off his log, jumped the creek channel, stomped on the ice as if in challenge -- dauntless in spite of his great age and haggard appearance. He must have come down from the cliffs to spend his few remaining days. - Ben C. Miller, Park Ranger

Thunder Bird Island - In Lower St. Mary Lake there is an attractive little island known to the Indians as "Thunder Bird Island." The Indians believe that thunder is made by a large partridge-like bird flapping its wings. A party once found it on the island and took it home with them to their tipis. They showed it to the medicine man, who claimed it was a medicine bird. As long as it stayed inside, the bird kept its eyes shut, but one day they were opened and streaks of lightning came out. The bird spread its wings and flew away, its wings beating out thunder. Whenever the Indian sees lightning and hears thunder he says that the thunder bird is flying. (Told by H. A. Noble, former manager of the Glacier Park Hotel Company)

Two Medicine in Winter - Two Medicine Chalets in February presents sublime winter desolation. Several of the cabin lodges have only the roof ridges visible above the snow. Huge drifts surround the grounds, and the roofs are swept bare of snow most of the time. A porcupine makes his rounds of the buildings and walks under the eaves. A coyote makes his nightly stalk across the yard in front of the main lodge and is literally king of all he surveys. Winds of terrific velocity sweep down the lake and strike the chalets, giving forth drab wailings of loneliness. - Clyde C. Fauley, Park Ranger

Trick Falls in Winter - In January, Trick Falls presents a very different picture from that familiar to summer visitors. The water is imprisoned behind an armor coat of ice, from which it breaks forth at the bottom of the fall. A sombre quietness pervades which to some would be drab loneliness; to others, a rare delight. On a waning January afternoon, dark shadows steal across the gorge; while in the background, Rising Wolf looms up, flooded with sunshine. Fir, spruce, and lodgepole are weighted with snow. Below the falls, the blue-green Two Medicine sings among the pines and plays hide and seek with the snowbanks in best approved fashion. - Clyde C. Fauley, Park Ranger

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UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
GLACIER NATIONAL PARK

GLACIAL DRIFT

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Eivind T. Scoyen, Park Superintendent Dr. G. C. Ruhle, Editor

"EVERY YEAR IS A NATIONAL PARKS' YEAR" (F. D. Roosevelt)

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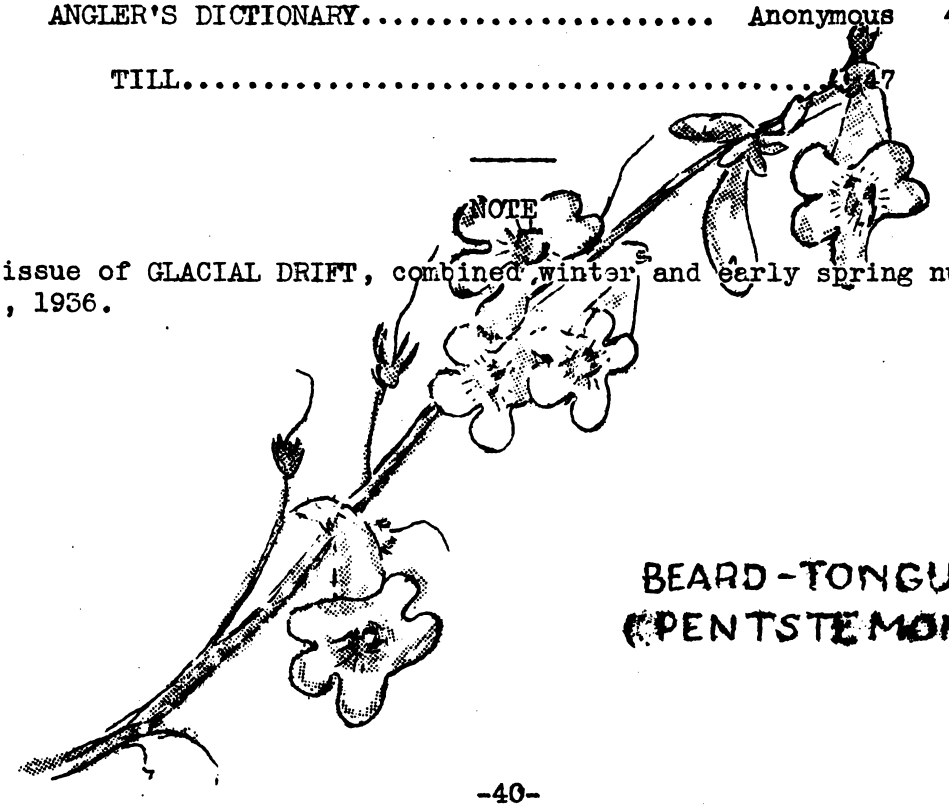
NOTE

Next issue of GLACIAL DRIFT, combined winter and early spring numbers in April, 1936.



BEARD-TONGUE
(PENTSTEMON)

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Glacier National Park, and when he picks up a chewing gum wrapper to make an alpine flower garden more beautiful.

Civic pride is a possession of every old timer in Glacier National Park. The spirit is contagious and soon a part of the being of every newcomer. It keeps the film pack tabs in your pocket, paper bags and picnic rubbish in receptacles; it prevents the carving of trees; bill boards are unknown; forest fires are criminal; and wild flowers remain in their native haunts. Whether this will carry over to the home community or not I am unable to say, but I do know that public sentiment is better than laws in obtaining outdoor good manners.

Last but not least, flower study must have pleasant associations. Anyone who has ever ridden thru acres of bear grass will always have a feeling of delight when seeing a field of this cottony flower. The yellow mimulus near the cool melting glacier, the Richardson tree squirrel gathering cones from the Douglas fir, the fringed parnassia on the edge of an unknown rock cliff, the scent of aspen wood smoke, the odor of the honeysuckle, the feel of cold air on the face when you left the heather to struggle over crag and rock, the mountain goats getting a living off the sparse plant life on a rocky ledge possess beauty, mysteriousness, dangerousness, and rarity. They are not isolated specimens but arouse the passion for discovery, unexpectedness, and the recreational diversion that can only come thru a flower trip to the land of eternal snow. What high school boy or girl would not list these as opportunities rather than requirements?

There are those who may still wish to figure the value in hours and dollars. If the class stays a week and works and thinks nature study for ten hours a day it will amount to seventy hours which will be equivalent to a two hour course for a year. In the senior high schools of Cleveland, the cost of instruction per pupil was $170 per annum in 1930. It is possibly $150 today, which would make five courses cost $30.00 apiece. From this data one may do all kinds of figuring about the cost of a week's trip in Glacier. This is the way we would reckon the cost of beans, cigarettes, or a movie. This, however, would not be the value.

*Editor's Note: Each year science teachers from high schools and universities bring classes to Glacier National Park for field study and observation. In this series of three articles, Dr. Vinal gives advice to high school teachers, but which is timeworthy for all nature students, young and old. Dr. Vinal ("Cap'n Bill"), ranger naturalist at Sun Camp in 1931, is head of the nature-study division of the School of Education, Western Reserve University, at Cleveland, Ohio.

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All the grooves trend North 28 degrees and the fault has the same dip as the strata, 11 degrees Southwest uncorrected. Besides the goats I actually saw, there were tracks in abundance wherever the talus had accumulated. Apparently the same tremendous forces that had tilted up the strata and caused the Lewis Overthrust were responsible for this "goat highway".

From the base of the cliff on Mt. Wynn one can see plainly that the present Sherburne Lake was originally two lakes, divided by a pair of deltas or alluvial fans. One enters the lake on the north from the stream east of Appekunny Creek; the other fan is being built directly across the lake, by a stream flowing into the south shore. This is really a beautiful example of the early stages of lake division, such a one as took place between the St. Mary Lakes due to the activity of Divide Creek.

The Cracker Lake valley is abundant in geological interest. When collecting some specimens from the dump of the old Cracker Jack Mine I realized for the first time that the ore is associated with an igneous rock, apparently dibasic material. The source became apparent later, when I found a huge dike of greenish rock cutting its way up thru the red strata of the Grinnell Formation on the cirque wall east of Siyeh Glacier. It strikes West-Northwest under the moraine and following the waterfall that covers the contact, it can also be traced thru the sediments to the hanging valley of the other small glacier on the far side. The rock of the dike has a green color and, like the diorite sill, is fine-grained at its edges and coarser towards the center. The color, I think, is due primarily to epidote, which is well polished on the numerous slickensides which cut the dike. The red argillites and quartzites have been altered by the intrusion of the dike, and adjacent to it are purple or almost black in color. The dike is roughly one hundred feet wide and its contact zone is about twenty-five to thirty feet in width. About half way up the wall the dike has displaced its own width by a fault such as I found in Ptarmigan Wall. Erosion has removed the diorite sill above the dike, so the relation of the two cannot be determined. One may be later than the other, or perhaps the dike was a feeder for the sill.

On the same cliff high above the glacier, where only goats and marmots go, I found a man-made pile of rocks. It was placed in a sheltered spot under an overhanging rock at the contact of the dike with the argillite. In the cairn was a rusty tin can containing a weather-beaten and partially disintegrated piece of paper. Enuf of it remained to show that it was the title to an old mining claim.

Waterton Grasshoppers - Early in August a brisk north wind carried millions of grasshoppers from the Plains into the Waterton Valley, and the Lake was covered with them for several days. Hundreds of gulls, which had arrived a week earlier, lived high while the grasshoppers lasted.

- Lou Hansen, Park Ranger

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THE MICHE-WABUN COUNTRY

M. N. D'Evelyn, Ranger Naturalist

Those who fear for the fast disappearing "pristine wilderness" of Glacier National Park, those who think of the Going-to-the-Sun Highway and this year's Kennedy Creek Fire and the North Fork Road as irremediably removing the charm of some of Glacier's valleys, those who long for a heavily forested, secluded valley with a little alpine lake at its head, a foamy trout stream and a trail used mostly by the deer and the bear will find solace in the fact that there is still at least one such valley in Glacier National Park. It is the North Fork of the Belly River, in the northeast corner of the Park, and running into Canada.

Today, when travel figures have passed the million mark, when the once secluded Kintla and Bowman valleys have become common camping areas, the North Fork of the Belly River is rarely visited by a park official, let alone a park visitor. In fact in the quarter century since the Park was formed only one Service man had been known to visit the valley--Ranger Frank O'Brien who travelled between Waterton and the Belly River by way of Street Creek and the North Fork in the early twenties. It is so little concerned with the administration of Glacier Park that there is not even a Park Boundary marker at the Canada-United States line. A few Canadian fishermen wander into the lower valley. The Canadian ranger may make the patrol several miles into American territory a few times during the fire season. Otherwise it remains the complete possession of the deer and the bear and the elk that wander in its dense fir and spruce forests and that cross its small meadows, still covered with the bunch grass that was once so common but is now so scarce on the Montana plains.

One morning in the mid summer of 1934 the Park Naturalist and I left the Belly River Ranger Station for the long twenty mile ride into this comparatively unknown valley. The meandering South Fork wanders in the grassy meadows below as the trail leads thru the aspen forests on the hills south of the river. Seven or eight miles from the station the International Boundary is reached, and the trail leads nearly three miles into Canada, across Beebe Flats, before making the swing back into the Belly River.

The trail into the North Fork was not easy to pick up. A web of game trails covered the semi-open forest alongside the South Fork crossing where we knew we should turn south. After trying a couple of false leads, we finally struck the thru trail and followed the west bank high above the river. Several times we dropped down to the stream, made the crossing, and then climbed high on the opposite bank. Twenty eight times the stream had to be forded in a three-mile course. No engineer laid out this trail; it is merely a game trail that has been cut out. The bunch grass meadows of the upper valley not only made a pleasing contrast with the dense forest, but promised good forage for the horses, forage which once fed the great herds of wild horses that roamed the Montana plains.

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Five miles up the valley we came to the lower falls, and under the protection of the steep bank and just beyond the spray of the falls we pitched camp for the night. This apparently was as far as the stray fishermen ventured into the valley, for little trace of human visitation was found beyond. The following morning we took the trail on foot, to explore the upper reaches of the valley. In this case "explore" is an apt word: there was no trail with the exception of the first mile; the dense forest made any progress difficult, and it was obvious that few had ever trekked it.

At the very head of the valley, some four miles from our camping spot we saw below us bell-shaped Miche-Wabun Lake, named in memory of the Cree Indians that sometimes wandered into the northern sections of the Park. Its color was a deep blue, and reflected the white of the Miche-Wabun Glacier which snuggled under the cliff at its head. No mountain highway, not even a trail skirted the shore of this lake. No boat docks, no trout fishermen broke its even surface. Mount Cleveland swept upward sheer from the talus slopes on its southern shore.

Everywhere on those bleak appearing slopes fruited the curious bladder pods with two bladder like cells puffed side by side on the end of each stem. More protected slopes were covered with stunted shrubby cottonwoods, here growing at an elevation of over six thousand feet. Here too were thousands of tiny raspberry bushes, each covered with delicious, rosy-red fruit.

For him who is unafraid to venture into remote regions, there still is wilderness in ample measure in Glacier National Park.

Ropers - Glacier Park was cursed with amateur lariat whirlers this summer. Early in August some sinner roped a little black bear cub, one of the twins of a brown mother bear that has been near the Switchback on Going-to-the-Sun Highway all season. Perhaps the mother charged and the fellow had to drop the rope, but not before it had tightened enuf to strangle the cub to death. The grief of the mother was pathetic, according to a bus-driver who passed by later. She would nuzzle the little one repeatedly, seeming not to understand why it would not respond. Finally she picked it up in her mouth and carried it down into the woods. A similar incident occurred a week or so later on Logan Pass. I found a Columbian ground squirrel with a fish line around its body just behind its shoulders. Somebody must have attempted to catch ground squirrels by laying a noose around their holes. This one had gotten away, but had snarled in an alpine fir. Thus I found it. I held it by the back of the neck, cut the string, and away it went--a good deal happier than the little cub. Why must people annoy little animals in that way?

- B. A. Thaxter, Ranger Naturalist

All sketches in this present issue are by Merritt Johnson of the Fire Protection Organization.

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ANGLER'S DICTIONARY

This dictionary was compiled by some unknown fish-fan and was distributed on mimeographed sheets at a Sportsman's Show at Los Angeles last winter. Further details about its origin are unknown to the editor.

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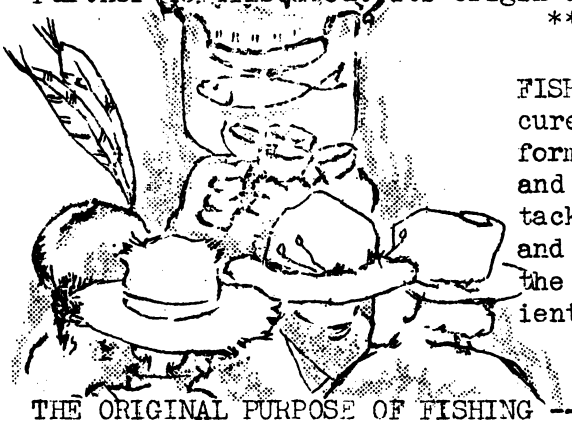


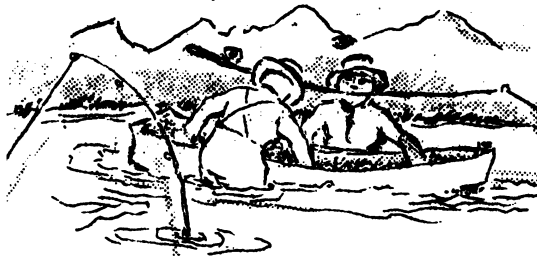
FISHING -- A disease for which there is no cure; "catching but not contagious". It formerly infected only savages, small boys, and village ne'er-do-wells; but it now attacks presidents, judges, ministers, doctors, and ten million others. In extreme cases, the fever can be reduced by placing the patient in the hot sun for several hours.

THE ORIGINAL PURPOSE OF FISHING -- Of inflicting pain upon the worm, the minnow, the frog, and the fish, has been reversed. It is now an endurance test of the fisherman--trials by sunburn and moon shine--mosquitoes--poison ivy--lack-of-sleep--camp-cooking and excessive confidence in "wild-deuces".

FISHING CAMP -- A place to wear out old clothes; play "old maid"; eat half cooked food; fight insects, and act red-blooded. Liveliest hours are from midnight to daylight. Happy camping parties have been spoiled by erratic individuals who insisted on "going fishing". A favorite camp motto is "Fish and Visitors smell after two days."

BOOTS OR WADERS -- An effective means of carrying a large quantity of water from the stream to a convenient log. Guaranteed to keep the feet hot in summer and freezing in cold weather. "Waders" hold more water than "Boots", and therefore are preferred in putting out camp fires.

FLIES -- A feather imitation of nothing-ever-before-seen, with very fanciful names, and the favorite food of house moths. Flies are principally used to decorate fishermen's hats, although some are kept in a fly book. Made in two kinds, "Anti-Volstead" and "Prohibitionist". Wet flies are gaining in popularity, are now favorites along the Canadian Border, and in Wisconsin, and some other states.



BOAT -- A leaky, ill-smelling tub, provided with two tomato cans for bailing, and a pair of mismated oars with one oarlock. Usually rents for $2.00 per day. Antique boats command a great premium.

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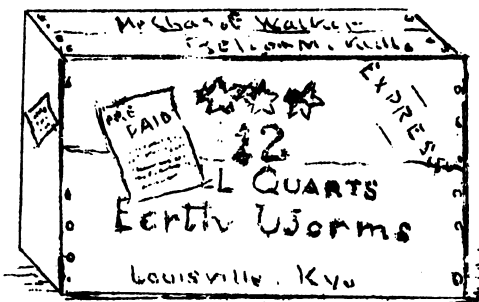
ROD -- A sporty name for a "fish-pole" costing over $5.00. Rods are sold by weight, the lighter the rod, the heavier the price. Like knights of old who splintered their lances in tournaments, all fishermen strive to have a fish break their rod--an event of great distinction to boast about.

REEL -- A coffee-mill invented by Satan, and designed to come loose, get out of order, or snarl up at critical times, thereby inducing lurid and profuse profanity.

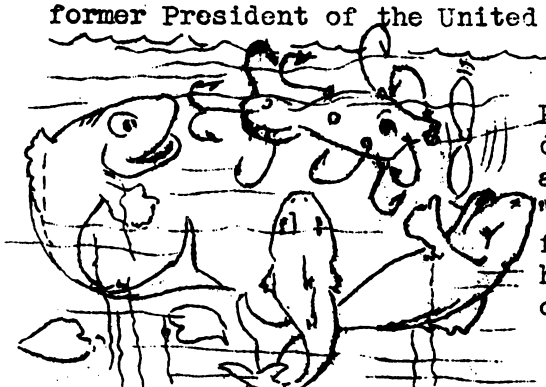
FISH-LINE -- An expensive piece of string used on a reel. It snarls, gets snagged, and is guaranteed to break at the right time, thereby creating the necessary alibi for the "whopper" that always gets away.



BAIT -- A secret word of the fishing fraternity for an illegal but highly exhilarating beverage, which is carried "on the hip". It will remove varnish, and counteract heat, cold, snakebite, bad luck, "that tired feeling", or "what-have-you".

GUIDE -- A true conservationist in disguise. His duty is to take you fishing "where they ain't", and to encourage you to come again "next week", when the water is lower, or higher, or clearer, or wetter.

WORMS -- Greatly scorned in writings and in public, but used widely and secretly by most trout fishermen. A few, hardened anglers, unmindful of public opinion, brazenly admit their use. Outstanding among them was a former President of the United States.



PLUGS -- Imitations of bananas, dill-pickles, darning needles, bugs, birds, bees, and animals. Now manufactured in many alleged "lifelike" shapes, and primarily designed to fool the fisherman and lure a dollar bill from his pocket. However, authentic records exist of many feebleminded fish taken on these lures.

CREEL -- The distinctive item of a trout-fisherman's uniform. A fragile wicker basket in which to hide a worm can, carry a fly book, lunch, slicker, etc. Occasionally used to hold small trout.

"THE CHRONIC FISHERMAN"

Plot on Thursday,
Organize on Friday,
Start on Saturday,
Fish on Sunday.
"Never Again" on Monday,
Still tired on Tuesday,
All set for more again on Wednesday.

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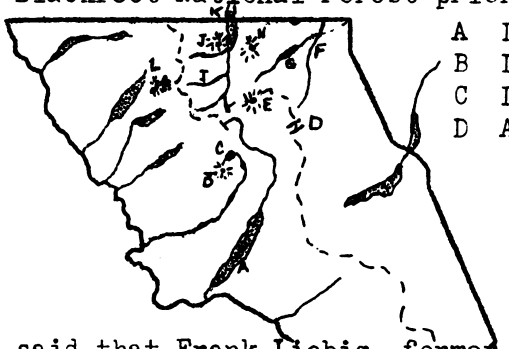
PLACE NAMES
of Glacier National Park and Vicinity

(No. 48-54) *Mr. R. H. Sargent mapped the regions of Glacier National Park in the northeast corner, around Lake McDonald, and around Bowman Lake. So far as is authoritatively known, he and Major Ahern are the only two people ever successfully to have led a pack train over the treacherous Ahern Pass between the South Fork of Belly River and Mineral Creek.

Being an admirer of the great poet, he named LONGFELLOW Peak. Lake Evangeline followed, naturally, and still later Evangeline Creek, tho these names were not given by him. His admiration for color furnished him with the name for RAINBOW Glacier and Peak.** The name GOATHAUNT had been suggested by Bailey Willis, who led the celebrated geological expedition thru the region in 1902. Dr. Willis first recognized and named the most celebrated geologic feature in the Park, the Lewis Overthrust.

Several features named by Mr. Sargent were for members of his party or for local people. GLENNS Lake was named for T.C. Glenns, born on the Crow Indian reservation, who was with Mr. Sargent as station assistant and recorder for several years. James Kipp had his cabin near Mount KIPP. VALENTINE Creek was named for Frank Valentine, a youthful packer from Columbia Falls. For his cook, Charlie Olson, friend of Frank Valentine, was named OLSON Creek. Later, someone named OLSON PEAK after the creek.

Mr. Sargent utilized all existent names which he found on a small map of the region published by the Forest Service, Glacier Park being part of Blackfeet National Forest prior to 1910.



A L. McDonald
B Longfellow Pk.
C L. Evangeline
D Ahern Pass
E Mt. Kipp
F Belly R.
G Glenns L.
H Goathaunt Mt.
I Valentine Creek
J Olson Mt. and Creek
K Waterton Lake
L Rainbow Peak and Glacier

**It is said that Frank Liebig, former Glacier Park ranger and now with Blackfeet National Forest was with Mr. Sargent on a trip on which the glacier was viewed glowing with iridescent colors in the light. "Just look, the glacier shines with all the colors of the rainbow!" remarked Liebig. The simile gave rise to the name.

*From a conversation of R. H. Sargent of the U.S. Geological Survey with the Park Naturalist.

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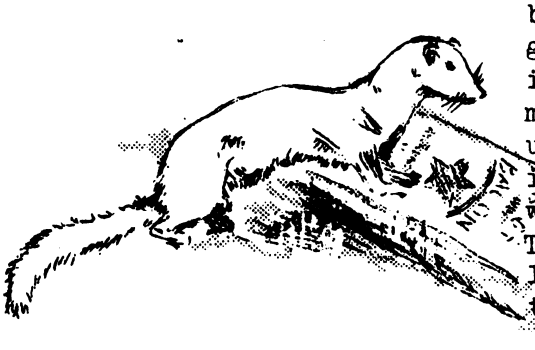
Algae For Beaver Houses - During a trip around Avalanche Lake last summer I picked up some tan, hair-like material from the surface of one of the beaver houses. From its odor and appearance I surmised it to be of animal origin, but sent it to the Wildlife Division for identification. There the material was identified as algae of the genus Rhizoclonium. Quoting Joseph S. Dixon, of that Division: "This identification coincides with my own observations and experience, since on numerous occasions I have found that such algae grows profusely on the bottoms of ponds, lakes, and irrigation ditches, especially in the late summer. On many instances I have found such material on beaver houses. Presumably it had been carried here along with the mud which the beaver used to plaster the house. I have never found any animal remains in the material that the beavers used to mud their houses."
- M. N. D'Evelyn, Ranger Naturalist

Audacious Marten - A marten of most audacious temperament inhabits the woods about Sun Camp. I first saw him one July morning as he crossed the trail near Baring Falls. Next he appeared on the porch at Sun Chalet, again in broad daylight. Never did the little chipmunks and mantled ground squirrels take to their burrows in greater haste! Later he ran thru the chalet lobby in pursuit of a ground squirrel. The best view of him was obtained near Sun Camp Ranger Station in August, as he walked leisurely down a sequestered trail, passing just a few feet from the naturalist's tent. Where he lives I do not know; but if he cares as little about showing his home as about showing himself, it will not be long before we find out.
- John S. Garth, Ranger Naturalist

Marauding Mink - The trail crew at the head of Red Eagle foiled a visiting mink's plans for breakfast of bacon and eggs. The mink had been noticed making trips in and out of their egg crate but no one paid any attention until it made a great fuss on one of its outbound trips. On investigating they found that the reason the mink did not slip under the tent with its usual agility and lightning speed was because in its mouth it had part of a slab of bacon which caught on the lower edge of the canvas. They retrieved the bacon all right, but soon learned that their egg supply was short by two dozen.
- Elmer Ness, Park Ranger



Ground Squirrel Hunt - One day I watched a weasel go down one ground squirrel's hole after another on Logan Pass. He did not stay in any burrow for any length of time and never seemed to find his prey, but there was not a ground squirrel in sight for a long while afterwards. The weasel allowed me to come within ten feet and I admired his sleek beauty, tho his appearance was that of the cruel, bloodthirsty little devil that he really is.
- B. A. Thaxter, Ranger Naturalist

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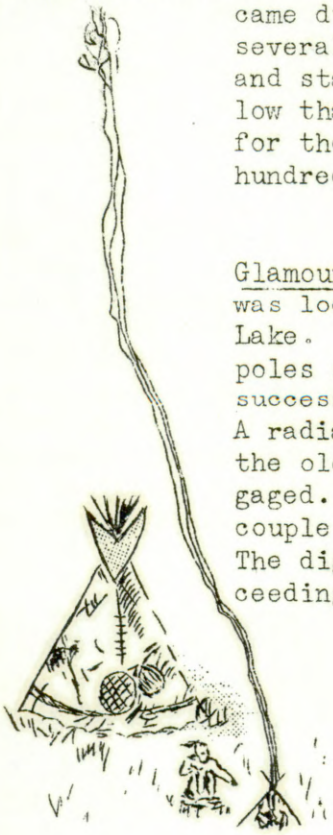
great numbers of pine squirrels in evidence." Mr. Fauley reports: "Rabbits fairly swarm. Marten are plentiful, altho five years ago my diary remarks that they were uncommon. Coyotes are attracted to the green timber by the abundance of rabbits. Mink signs are numerous." Other reports read similarly, and the frequency of mention of lynxes, foxes, skunks, hawks, owls, and their ilk, indicate that for these, at least, prosperity is not "just around the corner," -- it has already arrived.

Plans Awry - Much has been said of an uncanny engineering skill shown by beavers; but their plans, too, may go awry. On the North Fork, they felled a thirty inch cottonwood, which dropped the wrong direction and lodged securely in a forked spruce. - Channing T. Howell, Park Ranger

Befogged Ducks - More geese on their southward flight came thru in November than in October. A large flock numbering about seventy birds came during the big storm on the thirteenth and stayed several days. Each day they would rise from the lake and start for Koctenai Pass, but the clouds were so low that they could not find it; so they would return for the night and try again the next day. About one hundred ducks of many kinds accompanied the geese.

- L. O. Hanson, Park Ranger



Glamour of the Past - During October, an Indian camp was located above the outlet of Lower Two Medicine Lake. A squaw tended a small fire beneath a tripod of poles strung with long strips of meat from an elk, successfully stalked by her husband on the slope above. A radiance about her indicated how dear to the heart of the older Blackfeet was the task at which she was engaged. Here was glamour of the old days for this elderly couple which brightened their present drab existence. The dignified old man told me that last winter was exceedingly pleasant for his people, thanks to the Yellowstone buffalo meat given them by the Park Service. "It was fine meat, covered with yellow fat, because it was so rich," he said.

- Clyde C. Fauley, Park Ranger

The last bear of 1932 reported was at Belly River on December 9. The last one on the west side was at Lake McDonald, November 25.

Signs of mountain sheep on and near Chief Mountain indicate that they are again inhabiting this region. - Thos. E. Whitcraft

Ranger Newbury reported that on December 2 a mule deer buck had butted another buck and a doe off the highway into McDonald Creek above the trail-crossing viaduct. These were dashed over the series of waterfalls and drowned.

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