

U. S. Department of Agriculture.

FIELD DIARY

OF

Mr. *Vernon Bailey*  
*Biological Survey*  
(Official title.)  
*Glacier Park,*  
*1917.*  
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S-2887

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D. F. Houston  
Secretary of Agriculture.

8-2887

1917

July 1. Left Washington for  
Glacier Park 6:15 P.M. on  
P. A. Ry. Cool & pleasant.  
Crops good & winter  
wheat ripening and a few  
fields cut.

July 2. Daylight in Ohio.  
Crops late and winter  
wheat headed out but  
still green. Corn small  
only 4 or 5 inches high.  
Reached Chicago 2 P.M.  
and left at 10 P.M. on  
C. & O.

July 3. Daylight along  
east shore of Lake Pepin  
Reached St. Paul at 10 AM.  
cd from Minneapolis  
went up west side of Miss.  
R. to Monticello & St. Cloud  
cd reached Fargo at  
7 P.M.

Crops in Minn. - & Dak.  
good but late & small.  
corn only 2 or 3 inches  
high - only a few early  
potatoes in blossom.

Flowers mainly Epidendrum,  
Puccoon, wild roses,  
Orange Milkweed, galium,  
Astragalus borealis, Geranium,

July 4. Wakeup at Williston,  
N.D. A good growth of  
short grass over prairie.  
Dry farm crops fair,  
winter wheat heading out.

Montana.

Cactus & wild roses in blossom.

Milk River.

- Populus fremontii* abn.  
*Negundo*  
*Salix* "  
*Lepargyrea angustata* "  
*Eragrostis angustata*  
*Artemisia cana* "  
*Helianthus annuus* 4  
*Opuntia missouriensis*, com.  
*Malvastrum coccineum* "

At lakes east of Malta saw  
3 Pheasants, Great Blue Herons, ducks,  
Avocets, Gulls, Phalaropes & lots of  
waders, terns etc.

Big tule bordered lakes

Sage grouse near Chenook 4

Prairie dogs, a few at Porgon  
& Chenook & Hovee &  
Krevlin & Gifford, Chester,  
Devon, Shelby!!

Citellus richardsoni, all along to  
Shelby &

Glacier Park Hotel

- 4 Buffalo heads mounted + 24 skulls.  
10 Sheep skulls  
1 Mule deer head, mounted \$27.50  
White tail deer heads mounted  
26 Grizzly bear skins of many kinds.  
3 Alaska brown bear skins

July 5 - Glacier Park Hotel,  
Hunted and trapped and  
waited for Mr. Goodwin,  
the

July 6 ~~Same~~

~~July 7~~ Up to Two Medicine Lakes  
and return, up to west timberline  
where sheep trails were common +  
Hudsonian zone flowers + plants  
profuse. Ekt shades common in  
trails, Fresh bear signs of all  
green plants.

Canadian zone west of way.  
*Pinus murrayana* abundant, *Pinus*  
*flexilis* on lower hills, all abundant  
up above lakes, *Pseudotsuga*  
along lower lake, *Picea engelmannii*  
+ *Abies lasiocarpa* common cold slopes  
to timberline. *Populus balsamifera* along  
streams, aspens on slopes + bottom.  
Alder + willows abundant.

July 7. Left Glacier at 1:30  
& reached Many Glaciers hotel at  
6:30 - 55 miles.

The road crosses big moraine  
between Two Medicines & Cut Bank,  
then a broad valley and over  
another moraine to Milk River,  
then over another to Divide Cr.  
and a point of forested mountain  
& down to St. Mary Lake.  
then around lower St. Mary L.  
& up the Swift current to  
Many Glaciers hotel.

The plains country species  
come into edge of park at  
Cut Bank where *Citellus richardsoni*  
was seen along the road & may  
extend actually into the park,  
and at lower end of Upper St. Mary  
Lake where *richardsoni* is  
abundant actually inside of  
the park boundary.

This big flat is the lowest  
and vast plains like of any  
point ~~at~~ along the east slope.  
& the only real transition zone  
spot.

Lake McDevint is in pure  
Canadian with *Pinus murrayana*,  
*Picea canadensis*, *Abies* & balsam  
poplar & Aspens as the most  
abundant forest trees.

See note book for list of plants.



July 8. - Went up to Lake Josephine  
along south side & around &  
back on North side. Saw  
bear tracks & lots of birds &  
a few Columbia ground squirrels  
& mule deer tracks & heard pine  
squirrels. Saw flocks of 11 & 12  
downy young Golden eyes & a  
brood of 3 older ones & a few old  
females without young.

The Garden Wall is a great  
line of sheer crags & cliffs  
around the head of this valley,  
hanging with glaciers &  
snow fields & enclosing  
lakes & streams in the  
forested basins below.  
Ginnell Mountain across  
the lake from the hotel partly  
hides the Ginnell glacier  
just above Ginnell Lake.

July 9 Took saddle horse & went up <sup>Canada</sup> Crocker Creek to Crocker Lake and Sugh Glacier and found a new and ~~very~~ unwrapped glacier above it to the north! The lake is about timberline in an open valley between great craters. The glaciers are at the foot of great cliffs - both are small. The lake is milky green. Great snow banks come down to it.

Saw a hoary marmot & lots of columbian ground squirrels & some tracks of sheep or goats. One bear track on trail & one elk track.

Wonderful flower parks & meadows & slopes. Low blue columbines, Dryas, Sibbaldia peruviana, Silene acaulis

July 10, Many Glaciers.  
Caught *Citellus* down on  
big flats below the falls

July 11 Went up to Grinnell  
Lake and explored the head of the  
canyon but found no goats or  
sheep. Set traps in the woods

July 12 Went to Leeburg Lake  
and followed goats over the cliffs

July 13 Caught Woodrat &  
photographed it & ground-  
squirrels. Gave talk in evening  
to people at Hotel.

July 14 - Bright & fair -

July 15 - " "

July 16 - Went over Swift-current  
Pass to Granite Park where  
arrived at noon. In P.M.  
went to top of Swift-current Peak

7  
and made list of plants & collected  
specimens. I photographed  
Ptarmigan & young that  
Mrs. Bailey found just  
south of the Pass.  
Staid over night at the  
Granite Park Chalet.

A wonderful panorama of  
snow capped & ice covered ~~peaks~~  
peaks & ranges all around.  
Mrs. Bailey saw one goat &  
five mules deer ran past the  
Chalet. Lots of goat & sheep  
tracks & trails over the slopes  
but too many tourists have  
scared most of the animals  
away.

July 17 - Went around the point north of the Chahit and found where the hoary marmots lived along a cliff & on the big boulders below. First heard the long, loud & shrill & evenly sustained whistle, like a police whistle only more penetrating. Found 2 sitting on a ledge where they could overlook the whole valley and another below on a big boulder. Their long and bushy tails and galloping gait are very striking characters.

Mrs. Bailey saw 3 mountain sheep in the pass & Mrs. Ford saw 2 near the Chahit.

Several more ptarmigans were seen and another marmot.

Old convey signs & lay & woodrat signs seen in rock stidls at 4500 ft.

July 18 - Went down into the meadows south of the Chohit + on the ridge beyond where I could see the whole length of Lake Mc Donald.

Wonderful flower gardens cover the ridges and meadows, acres of great yellow *Erythroniums* in solid stands, fields of big creamy buttercups, shooting stars, spring beauties, buttercups, *Bryanthus* + *dedum*.

Bears had dug yards of sod out in search of *Erythronium* bulbs, some very fresh.

These big crisp tender bulbs are very pleasant tasting + more delicate than canes.

Bears have also dug out numerous quadrupeds last fall, tearing out sods + bear grass roots + stones + one little balsam tree + generally finding the nest down 2 or 3 feet + 4 to 8 feet deep.

Extreme timberline is at about 8000 feet on SW slope of Swift Current Peak on SW slope and this seems to be as high as any.

7000 on NE slopes seems to be about the average, tho in shot in circles like Cracker & Seebud & Ginnell it is not above 6000 feet.

A porcupine got into the store house & went around the garbage pile for food.

Snowshoe rabbit signs seen in brush.

In PM returned to Mary ~~Fort~~ Glacier. Found Cassiope in the Pass and great beds of Dryas & silene acaulis, Bryanthus & Kalnia glauca, a big white Caltha or Ranunculus, besides lots of shooting stars, buttercups, potentillas etc. There are many large snowbanks still lying in the pass and patches of dwarf spruce & fir - Pines abietalis are scattered over it, but all much flattened & dwarfed.

The trail makes numerous zigzags down a steep wall over a 1000 feet & strikes the bottom of Swift Current Valley.

July 19. Wrote reports and notes  
of the last trip

July 20 - Walked down to  
the Upper Sherburne Lake  
through the flat valley bottom  
over 3 large prairie strips  
and in the willows and aspens  
between. Found a fish hawk's  
nest + a lot of valley birds.  
Some good beaver dams + ponds  
+ houses along side creeks and  
an old dam and a big house  
on flooded bottom of Sherburne  
Lake. A dam is being built  
across the lower end of the lake  
by the Reclamation Service to  
make a reservoir of the valley +  
the beaver are crowded back up the  
valley as the water rises.  
Saw a muskrat + a big bear track  
+ lots of *Citellus columbianus*  
clear down to the lake, and lots  
of big hills of *Thomomys talpoides*  
at lower part of valley.



July 10 Bl. L. L. L. L. L. L.

July 21. Took part of our outfit  
needed for camping and came  
around by stage to St. Mary  
where we stopped over night  
to study birds & mammals of the  
low country below the Chakt.  
Tramped over the big prairie  
flat below the Upper Falls  
where *Citellus richardsoni* &  
gopher hills are abundant inside  
the Park line. This flat is  
4448 feet, the lowest point  
on the east slope of the Park and  
brings a number of low plains  
species into the park that are  
not found elsewhere in it.  
viz. *Citellus richardsoni* & *Blarina*  
& *Microtus pennsylvanicus* & species  
of birds & plants.

The blackflies are the worst I ever  
saw them & make life unbearable  
in the open. They are the point of today  
trav.

July 22. Sunday. Took boat at 11:45 AM for Sun Camp about 3 miles below upper end of Upper St. Marys Lake. Arrived at 12:30 and found a most picturesque chalet on a high point of wind swept rocks at the very foot of going to the Sun Mtn.

In PM followed trail above head of lake & met Harold Bryant & part - his wife & Mr. Gentry of Los Angeles & his wife & Mrs. Rich of Boston & her son.

Found water ouzel nest under falls of Baring Creek.

Good trail through dense forest all up north side of lake. Timber mainly Lodgepole Pine, Spruce & fir, but a little *P. flexilis* & *Pseudotsuga*, also *Populus tremuloides* & *balsamifera*.

July 23 - Went up Baring  
Creek to Sexton Glacier on east  
side of Going to the Sun Peak.  
Mapped the life zones and took  
photographs of white goats - at  
7500 feet, near the Sexton Glacier.  
Collected Arctic Alpine plants.  
Returned to Sun Camp at the  
edge of St. Marys Lake and near  
the foot of Going to the Sun Mtns.

Saw a *Lepus macrotimbalus*.



July 24 Did not work far from  
Camp. Listed trees & plants  
& birds & mammals.  
Saw a large *Peromyscus*  
in evening.

July 25. Went up Roers Creek  
around the east side of Goat  
Mtn. but not to extreme head  
of creek. This is a long  
valley full of dense timber and a  
big roaring creek. The trail  
has not been cut out for  
many years and we are not  
been in the canyon lately  
if at all this year.

There is no great scenery  
or special attraction in the  
canyon or it is a good  
game region. Saw a few  
elk or deer tracks and  
numerous trails of goat &  
sheep high up and lots of  
signs of bear. The trail  
had best remain closed  
as a protection to game.  
Tramped at least 20 miles  
about here without trail.

July 24 - Moved camp up  
to near Piegan Pass and near  
to Siegel Pass where we camped  
just below the lakes at 7000 feet  
in Hudsonian zone, under shelter of  
dwarf spruce & fir & *Pinus albicaulis*  
and in meadows of *Erythronium*,  
*Pulsatilla*, *Buyanthus*, *Cassiopea*  
& dwarf willows. Big snowbanks  
& ice rimmed lakes lie just  
above us and the bare carpet of  
*Arctia* alpine plants covers  
the Siegel Pass saddle just  
700 feet above us.

Saw 8 goats on north slope of  
going to the Sun Mtn.  
Listed & collected plants over  
the pass.

Goats 9, 6, 5, 3, 1, 1,  
 Mule deer, 18 near camp  
 Citellus columbianus, -  
 Callospermophilus, 1 at 7600 feet.  
 Eutamias  
 Microtus macroopus,   en.  
 Evotomys 2  
 Peromyscus 1  
 Ochotona 1 in Pigan Pass  
 Eutamias amoenus 3. " "  
 Marmota 1 x 2 yg.

July 27 Went up to Pigan Pass, a mile west of us and then up over the ridge of Pigan Mtn. where we saw 14 goats & would have gone on to the Hanging Gardens but the wind carried us off our feet on the ridges & made travelling hard. + dangerous & little could be seen.

The goats were moving to places of security among the shelves of cliffs where they could be out of reach, but were exposed to fierce winds.

A flock of 6 had one kid, another of 5 had 2 kids & another old goat & kid were on a shelf by themselves. Two lone goats were seen on their way to the Sun Mtns.

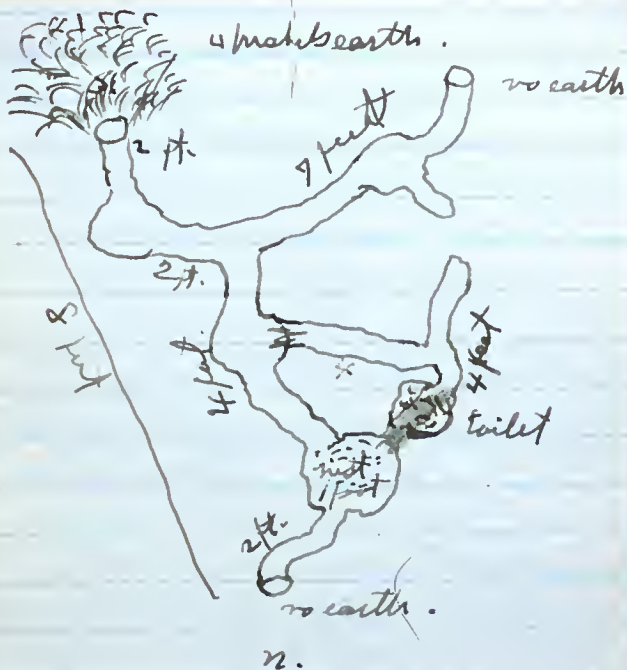
Saw a Coyote in the Pass.

July 28, Wind blew so hard we could not go up the Mts., so set traps & dug out Citellus columbianus den.

The mound at entrance was 5x6 feet & 14 inches high & contained about 4 bushels of earth & indicated a winter den. I caught the old ♀ at the entrance then dug out & mapped the burrow, which went directly under the base of a small fir tree. The main burrow was 3 to 4 inches in diameter & ran down a foot deep, then back 2 feet to a small chamber where it turned & 2 feet more to where it foraged, then 4 feet more to a big nest chamber a foot in diameter & a foot below the surface. This was nearly full of old nest of last year with a little fresh grass (*Carex*) carried in lately & evidently used as a bed chamber.

at the present time. The nest was dry & warm & clean in the middle but old & damp & stinky at the bottom. A small tunnel ran out to the surface 2 feet below the nest & the main tunnel ran deeper down to a cavity where all the excrement was deposited 2 feet below the surface in a half full old nest chamber. From here the burrow forked again & one branch returned to the second chamber & the other ran to a blind end. The den had 3 openings, four chambers, one nest & one toilet, no food chambers & no food stores. Its greatest length between doors was 8 feet & its greatest depth 2 feet.

The old female caught at the burrow was only a little fat; stomach full of green herbage.





July 29 Broke camp & went  
down to Sun Camp and back  
up to Gunsight Lakes & camped  
at lower end at ~~the~~ 5276 ft.  
in meadow among alders & firs  
in edge of Hudsonian zone.

All heavy timber up to foot  
of Fusilade Mtn. where snow slides  
have dried off, the timber & left  
willow & alder & other soft brush  
instead of trees.

Found an small *Thrya afflicta*  
about opposite upper end of St. Mary  
Lake, & some *Taxus* scattered  
along trail 3 to 4 miles above lake  
and *Fatsia* *hirsuta* abundant in  
upper end of canyon up to  
Gunsight Lake, all overlapping  
species from the west slope of the  
Mts.

Big mule deer track down trail & a  
big Coyote track within a hour's camp.

July 30 Found 2 ♀ harlequin  
ducks in Quasi Lake,  
*Aythya hindsii* with big bushy  
tail & yellow belly climbed a tree  
at old Chalet, *Citellus columbianus*  
are numerous & hoary wampets  
are common at upper end of  
lake & cones were squeaking  
in rocks.

Cold & windy & rained &  
snowed in night, but we  
have a comfortable camp

Saw beaver dams & ponds along  
St. Mary River.

Furnsight Lake & Pass

- Odocoileus* a few tracks  
*Oreamnos* not com.  
*Ovis* - "  
*Sciurus* heard  
*Eutamias hindsii* 1 at Lake  
" *oreocetes* 2 in Pass  
*Citellus columbianus*, com. over Pass,  
& at Lake & below & at glacier.  
*Marmota calligata*, com. 4 yg. Aug 1.  
*Callispermophilus*, 1 near Pass  
*Microtus macropus*, signs com.  
*Castor*, 2 in Lake,  
*Eutamias* track below Lake  
*Canis latrans*, 1 & tracks.  
*Ursus* com.  
Bat 1 seen July 31 at camp  
*Ochetona bay*, old rem near glacier  
*Lepus bandi*, com.

July 31, Went over to Blackfoot  
glacier, crossed first lobe and  
went out on much larger lobe  
of the second col warm glacier  
Saw a large Coyote coming  
across foot of glacier.

Aug. 1. Over Gainsight Pass  
to Lake Ellul Wilson & down to  
falls at lower end. Then back  
to camp. Got good notes  
& photographs in pass.

Aug. 2. Moved camp to our old  
camp near Piegan Pass  
at 7000 feet.

Aug. 3 - Came over Piegan Pass  
and down to Maus Glacier.  
Got *Cory* & *Eutamias amoenus*  
in pass & took photographs of  
*Pterodroma* & *Citellus columbianus*  
& *Marmota* in Pass.

Aug. 4. Camped on Swift  
Current River half way from  
Mammoth Plains to Sherburne Lake.  
Outfitting for long trip  
north to Belly River. Waterton  
takes & returns.

Aug 5. Made up specimens &  
collected a few. Packed up  
ready for trip.

Heavy frost in evening.

Flies & mosquitos still bad.

Aug 6. Frost a day.

Aug 7. Broke camp on Swift Current  
and came to Reclamation works at foot  
of Four Sherburne Lake, then turned  
north over big ridge to Kennedy  
Creek and camped near the Park  
line on the South Fork.

Rained most all day.

Got notes of Stephenson.

Aug. 8. Rained a little in morning. Lots of snow on Mts. A cold night but cloudy & no frost.

A trace of transition zone on warm slopes of Kennedy Creek, a few *Betula fontinalis*, lots of *Corylus*, *Elaeagnus argentea*, *Gaillardia* and other plains plants. The bulk of timber & vegetation however is Canadian and along the boulder and gravel strewn bed of the creek *Dryas octopetala* & *Godetia* from the Hudsonian zone are thickly strewn and both have gone to seed.

Crossed South fork at its base & climbed up the slope of Yellow Mountain to near timberline & crossed between the main ridge and Shurburne Peak, there across a wide Hudsonian zone slope where a new spruce with long

*Odocoileus macrotis*, track & shed horn  
 Thompson hills, com. - S. Fork  
*Sciurus* com. in woods  
*Eutamias luteiventris*, com. low down.  
 " *oreocetes*, 1 on point of Yellow Mts.  
*Ursus* track on trail.  
*Canis latrans*, tracks in trail.  
 Buffalo horns & skull at Ranger Station.  
 Ovis horn " " "  
 Elk horns, " lot at " "  
*Odocoileus borealis*, 1 horn " "  
*Ochetona* - heard on point of Yellow Mts.

drooping cones was the dominant  
 tree, then down, down, down,  
 to the north fork of Kennedy  
 Creek and camped at the  
 ranger station on the south base  
 of Chief Mountain. Can only  
 8 or 10 miles, but it was  
 enough with our heavy packs  
 over the steep trails up and  
 down. Camped in dense  
 woods.

Colored zone map from high  
 point on Yellow Mountain.  
 Could see ~~the~~ Lake & 22 others  
 from high point & out over plains  
 into Alberta & the Sweet Grass  
 Hills.

Aug. 8 - Followed up North Fork  
Kennedy Cr. to Slide Lake and then  
turned north over high ridge  
between Chief Mountain and Goble  
Peak, then down to South Fork  
of Belly River and Camped just  
below fork of South and Middle.  
Camp about 10 miles.

Stopped on top of ridge & followed  
goat & sheep trails along summit  
to base of Chief Mt. peak but  
found no sheep. The tracks and  
trails are numerous.

Saw 6 goats on point above  
Slide Lake, one on peak of  
Goble and one old goat with  
kid at base of Chief Mtn.  
Lots of tracks & wool and the  
nails along crest of ridge are  
worn deep.

Coyote tracks on all trails and  
across swab fields & goat hair in  
droppings.



Chief Mtn. Ridge.

- Odocoileus hemionus* tracks at timberline  
*Oreamnos* 9 seen - lots of tracks  
*Ovis* lots of tracks  
*Sciurus richardsoni* heard in woods.  
*Eutamias amoenus*, seen in burns  
" *felix* 1 at timberline  
" *oreocetes* heard at -  
*Callospermophilus*, at & above timberline, com.  
*Marmota flaviventris*, at & above timberline  
*Thomomys* ~~frankii~~ *frankii*, hills at timberline  
" *talpoides*, abn. at Belly R.  
*Neotoma*, w/te soap at ranger station.  
sign on rocks to above timberline.  
*Peromyscus* in cabin at Belly R.  
*Zapus* in meadow " "  
~~*Citellus*~~ abn. on Belly R.  
*Erythronium* signs in Belly R. Valley.

Aug. 10. Belly River.

Rode up South Fork about 8 miles to a point 2 miles above Elizabeth Lake, but it rained so hard & turned back without going to head of canyon. Shot a Franklin Grouse & saw tracks of Moose & goats & bear. Goat tracks were seen in trail along bottom of canyon & goat wool on bushes in woods.

Bear have dug over many roots of *Erythronium* root at end of Elizabeth Lake.

Wonderful mountains all around but obscured by clouds much of the day. Big, dense forest, ideal for deer woods.

Our camp at ranger station is in big meadow of good grass.

Aug. 11 Went up to Crossley  
 (The name was Crossley)  
 Lake and Glenn Lake to about  
 a mile of upper end. Followed  
 old wagon road through beautiful  
 woods of larch, spruce &  
 fir woods but could not see  
 out much of the way to either  
 lake or mountains.

Open country & beautiful views  
 along Crossley Lake & at lower  
 end upper end of Glenn Lake.  
 Both are beautiful sheets of water,  
 deep & clear & dark blue with  
 wooded shores & wonderful  
 reflections of trees & mountains.  
 The view from side of Crossley Lake  
 is one of the finest we have seen with  
 Cleveland on one side & Cathedral  
 Kipp & Merritt peaks at the head of  
 canyon & the Stanley & Shifford  
 glaciers, falls & snow fields in view.

a hotel or Chalet should be  
built here. A good auto road  
could run to the head of each  
branch of the canyon and  
up through pine forests or along  
lake shore or mountain foot.  
The lakes are full of good big  
trout of the cutthroat &  
Macbrinae & of whitefish.

Saw a loon & 6 young  
Canada geese & a greening  
woodpecker & a porcupine that  
was the largest I ever saw.  
I estimated its weight at 35 lbs.  
but 3 other men including  
Bill Gurd put it at 45 & 50.  
It ate half a belly band &  
part of a better & middle &  
was chased out of camp two  
nights, then killed &  
saved the harness.

Aug. 12 Went again up  
to head of ~~the~~ Glenn Lake & then  
up toward Shepherd Glacier but  
found no trail & woods so thick  
& big we could not get even  
to foot of the 3 high falls that  
come out of the Glacier.  
Found some goat signs up a side  
of cliff but saw no game except  
12 lobsters. Made a hard all day  
trip for little returns.

Aug. 13 Bede camp and moved  
down the Belly River to the  
Canadian line, about 6 miles,  
where we camped near river.  
The line shows as a wide road  
cut through dense lodgepole  
pine over the ridges both sides  
of river.  
Lots of beaver work along river.  
Some *Transectus* grass meadows.

Aug. 14, Continued down Belly  
River about 6 miles to below the  
beaverdams, then turned west, off  
the wagon road and followed  
trails over low open hills  
to the Waterton Lake Valley,  
about 6 miles farther, then down  
around the lower end of Lower  
Waterton Lake across the wagon  
bridge and up the west side  
of the lakes to the summer camp  
at 2 miles ~~to~~ north of the U.S. line  
and camped. Came about  
20 or 22 miles over good  
roads & trails, but it took  
all day.

A large part of the trip was in  
Transition zone with open plains,  
good grass and *Balsamorhiza*,  
*Symphoricarpos occidentalis*, *Pulsatilla*  
*patens*, *Arenaria borealis*, *Oreaster*  
& many new plants.

Bully R. & Waterton Lake, <sup>Alberta</sup> Aug. 14.

*Odocoileus hemionus*, tracks com.  
*Sciurus* in timber, com.  
*Eutamias luteiventris* "  
*Citellus richardsoni*, com. on Bully R. Holes  
com. on Waterton Lake, W. side.  
*Citellus columbianus* - com. at camp - Waterton.  
*Thomomys talpoides*, com. all along.  
*Fiber* - pond. burrows.  
Castor, com. along Bully R.  
*Canis lotor*, com. burdig. signs cattle hair,  
" mites, ? signs, cattle hair.  
*Ursus americanus*, old bear & 2 cubs.  
*Putorius longicaudus*, 1 dead near Waterton.  
*Lutreola* den & signs com. <sup>lower</sup> Waterton.

Aug. 15 Waterton Lake.

*Nycteis cinerea*, 1 in sunlight, 11 A.M.  
over edge of lake.

Canadian zone spruce & fir  
& aspens & balsam poplar &  
*Betula glandulosa* covers the cold  
slopes, gulches, cold bottoms,  
and in all nearly half the area.

The Waterton Lakes are like the  
others, wonderful bodies of pure  
cold water, between wooded  
shores, the upper lake being between  
the high rugged peaks in the  
deep glacial gorge.

Lots of *Citellus richardsoni* in  
the open flats of the Bully River up  
to a mile of the Park line &  
numerous holes & runs up to near  
camp on the Waterton Lake, but  
at camp there are only  
*Columbianus*.

Aug. 15, - Went to upper end of  
Upper Waterton Lake on the boat  
with Capt. Hanson, about 6 miles  
& returned to camp at lower end.  
The lake is low (4186 feet) and a  
slight element of transition zone  
species extends above it, tho  
the forest is generally solid  
Canadian, lodgepole, spruce &  
balsam & pretty dense and  
continuous.

The mountains rise high &  
steep and close on both sides of  
the lake.

Found a *Carnivorus frontalis*  
& 3 young at upper end of lake & a  
fisher's nest.

A porcupine had eaten the edges  
off a table at the ranger's cabin  
& woodrats had made nests in his  
storehouse.

Aug. 16. Worked down the valley  
toward lower Waterton lakes.  
and camp.

Aug. 17. Broke camp and followed  
up trail to Owl City & then up  
to Wall Lake where we can  
get a good view of the Kinella  
Glacier by climbing the ridges  
above.

Came through burnt timber  
to Owl City where an old  
prospector well is still trying  
to keep alive. Then through  
thick timber to the lake at  
edge of timberline on steep N.E. slope.

The lake is small and wooded on 3 sides  
but snowbanks lie along the cold edges.  
Mr. Yard caught 12 pine trout in the lake  
for supper. *Citellus columbianus*  
are numerous & noisy near camp.



Wall Lake & ridge above Aug. 18.

Oreamnos, tracks & signs & trails  
Sciurus nebulosus —  
Eutamias  
Citellus columbianus, abn. to

Aug. 18. Went up past  
Wall Lake and on the ridge to  
the west of it where we had  
a glorious view of Upper Kintla  
Lake, Kinthy Peak and Glacier  
& the Agassiz Glacier.  
The mountains in this region are  
the finest of the Park, high & rugged  
& with many large and small glaciers.  
From the head of Upper Kintla Lake a  
trail can easily be made up  
to the middle of Agassiz Glacier  
& others to the high passes &  
peaks of a wonderful Alpine  
region.

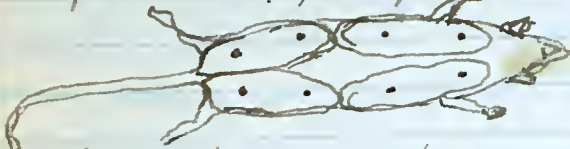
Collected in zone trap as far as  
I could see.

The western tamarac is said to be  
common to head of Upper Kintla  
Lake and from 3000 feet above it  
I could see the tall trees standing  
above the black spruces & firs.

Wall Lake <sup>B.C.</sup> Aug. 19.

Zapus 2, ♀ J  $\frac{1}{2}$ , A  $\frac{1}{2}$ , P.  $\frac{1}{2}$  - Galen  $\frac{1}{2}$ .

Mammary glands 4, overlapping but separate - very large & wide & full.



Long feet missing but glands still large & containing milky fluid, not fat;

Stomach <sup>intestines</sup> very large & full of grass or corn seeds. Must fatten rapidly.

Sorex obscurus ♀. J  $\frac{1}{2}$ , A  $\frac{2}{2}$ , all on 2 mammary glands, very long & large.



The dense stand of spruce & fir & lodgepole pine carries Canadian zone well up on the slopes to about ~~8000~~<sup>7500</sup> on warm & 6500 on cold slopes.

Hudsonian runs 1000 feet above and the ridge where we reached is about 8000 feet and above extreme timberline, tho a few dwarf abies near to the Peak. We are close to Boundary Peak on the same ridge & 500 feet higher.

Abies, Picea, Pinus albicaulis & Larix lyelli are the timberline trees, the tamarac in abundance reaching through Hudsonian zone to extreme timberline. While not quite so hardy on wind swept slopes as Abies it is taller & more of a tree to its limit. When the other 3 trees are dwarfed a little lower it stands 30 or 40 feet high as a sturdy tree.

July 19, Returned to Waterton Lakes.

Aug. 20 - Up past Waterton Lake to Reynolds Cabin.

Aug. 21. Remained at Reynolds Cabin and worked up the valley and around the lakes while Mr. Yare went to Browns Pass and back. Saw lots of birds and tracks of deer and bear & coyote & porcupines and in P.M. wrote up back notes.

Aug. 22. Broke camp and followed up valley through 4 miles of magnificent forest of mainly engelmann spruce. Trees 100 feet high & 3 or 4 feet through. Some loggpole pine & fir and a little douglas spruce mixed through and one tamarack tree, Lyell.

Then climbed up through alders & willows of a big slide track about 1000 feet & then another 1000 through open forest & timberline meadows to the summit of what the guides call Flat-top, but really a great shoulder of Kipp Mtn. The real pass from Waterton Valley to Mc Donald valley lies 1000 feet below us at 6000 feet with a gentle slope up each side and a natural & the lowest highway across the range.

Our summit is 7000 feet & pure hudsonian, mainly trees and beautiful grassy & flowery parks. Came down about 500 feet & camped on Kipp Creek at edge of timber.

~~Saw 5 white ibex & 15 goats.~~

Whitetail deer, 5 above timberline

Goats, tracks along Kootenai Cr. a high up.

Saw 15 goats along high ridges &  
at head of Cattlequeen Cr.

Black bear tracks along trails & a bear in camp.

Silverfish, reported in camp, seen by Ford.

Porcupine tracks along trail, both sides.

*Citellus columbianus*, abn. at camp  
& all over upper slopes.

*Eutamias fedix*, heard in woods &  
one seen. sharp roars.

*Sciurus hudsonicus*, com.

Zapus, 1 dead & several seen.

*Peromyscus*, com. at Reynolds Cabin.

*Evotomys*, " " " "

*Microtus oregonus*, com. above timber.

*Ochetona*, heard high up.

*Marmota flaviventris*, com.

Coyote, tracks com. all along trails.

Aug. 23 To Granite Park.

Followed down Kipp &  
Hanks Mineral Cr. to near  
junction with McDevall Cr.  
then turned up ridge to  
Granite Park & camped.

Found luxuriant forest of  
spruce & fir along Mineral Cr.  
and on hot slopes low down  
*Pinus monticola* & *Taxus occidentalis*  
are common. Found one *Thuja*  
*plicata* & lots of *Zapus* &  
*Fatsia bartrami*, *Sasapilla*,  
& on open slopes *Holodiscus*.  
Mapped warm slopes as transition  
up to 4500 feet.

A big fir with flat branches  
& green cones looks like  
*concolor* but I could get only  
a branch. A *Picea* with  
long, green cones is not englemanni.

The undergrowth is dense & rank  
and ferns are big & abundant.  
Saw 6 species low down & two  
more high up ..

Camped at Granite Park after  
a steep climb of nearly 3000 feet.

Aug. 24 Went in to Many  
Glaciers & packed up for trip  
to west side.

Aug. 25 - Took stage to Glacier  
Park Station and waited over  
night for morning train to  
Belton by daylight.

Aug. 26 Left Glacier at 10 AM.  
& reached Belton at 12 &  
Lewis's at head of Lake Mc  
Donald at 1 PM.

Aug. 27. Went up Mc Donald Creek  
& fell and found Kerkelium ducks  
& water ouzel nest.

Saw a bear eating service berries  
and tracks of Moose, deer, mink &  
coyote.

Aug. 28, Went over summit of ridge  
north of lake to Trout Lake valley  
and back. Lots of birds, some tracks  
and small game.

Aug. 29, Wrote reports.

Aug. 30 - Wrote and tramped around  
lake. Saw a martin climb a tree  
and went up after him and made  
him jump across to another  
tree and then to the ground.

Aug. 31, Returned down lake and over  
to Belton. A little snow in night  
has whitened the peaks. Cooler.  
The weather has been very hot and dry  
and big fires are raging S & W. of here.

Ran down to Columbia Falls  
and saw the taxidermist, E. S. Bryant,  
and got many important notes on  
birds and mammals. Also was able  
to check up the life zone areas.

The western slope of the Glacier Park  
shows peculiar ground conditions, the  
lower warm slopes showing a great  
mixture of Canadian and Transition zone  
species, the trees being mainly Transition  
and the undergrowth where the sun  
never shines on the cool ground  
being carpeted with Canadian zone  
species such as *Pachystima*, *Linnaea*,  
*Zyadella*, *Cornus canadensis*,  
*Clintonia uniflora*, with much *Taxus*  
& *Fatsia*. The effect of deep shade  
heavy snows, and humidity and rich  
soil results in the same association  
of plants as occurs on the Pacific Coast  
slopes of Oregon.

Glacier Nat. Park.  
Arctic-Alpine zone Plants.

*Polygonum compactum*

*Silene acaulis*

*Draba*

"

*Salix*

"

*Oxytropis*

*Saxifraga*

"

*Potentilla*

*Aquilegia canadensis*

*Arenaria*

*Antennaria*

*Thlaspi*

*Anemone*

*Sibaldia*

*Claytonia ovalifolia*

Hudsonian Zone Plants

*Pinus albicaulis*  
*Abies lasiocarpa*  
*Picea engelmannii*  
*Salix*

"

*Agrostaria oxycanthoides*  
*Bryanthus empetrifolius*  
*Kalmia glauca* <sup>*glaberrima*</sup>  
*Casiopia*  
*Dryas octopetala*  
*Phacelia*  
*Pulsatilla occidentalis*  
~~*Ranunculus*~~ *abriflorus*, *fig. hille*,  
*Godetia*  
*Oxaria digginsii*  
*Silene acaulis*  
*Saxifraga*  
*Veronica*  
*Armaria*  
*Stellaria*



*Orthocarpus*  
*Pedicularis* white  
 " purple  
*Edephantella*  
*Astragalus* white  
 " purple  
*Anemone borealis* ?  
*Polunium confertum*  
*Allium*  
*Junonia*  
*Sedum*  
*Sibaldia procumbens*  
*Delphinium*  
*Hypnum*  
*Vaccinium dasycarpum*

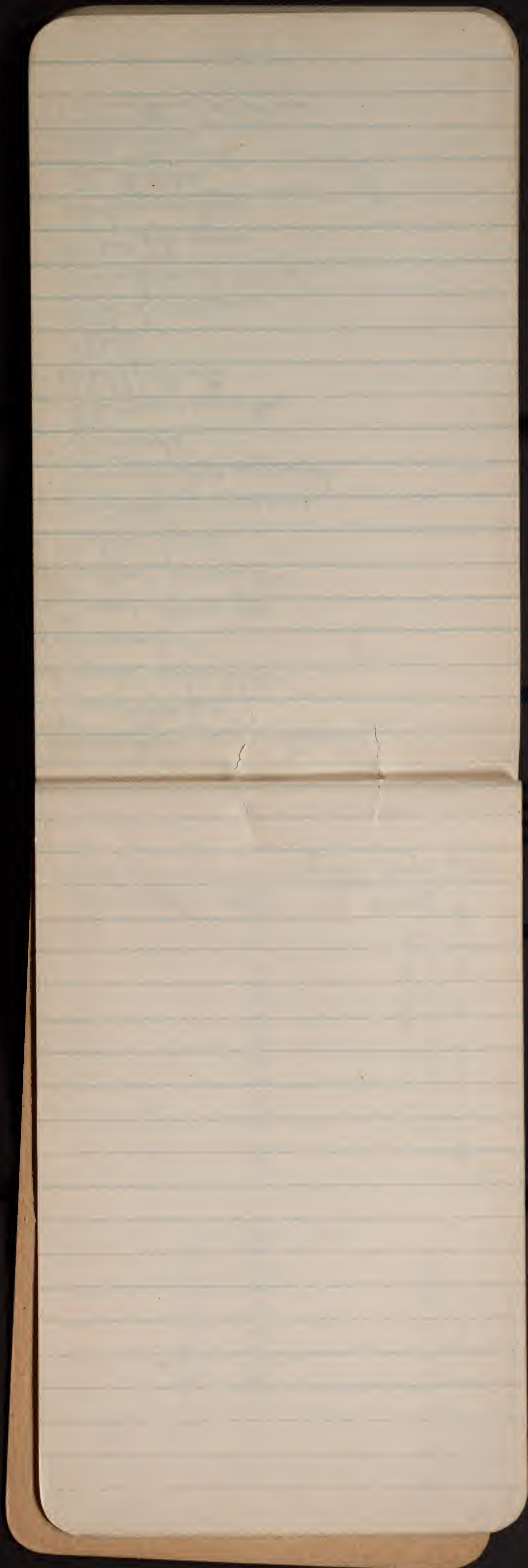
Canadian Zone plants -

*Pinus Murrayana*  
 " *flexilis*  
*Picea engelmannii*  
*Abies lasiocarpa*  
*Populus tremuloides*  
 " *balsamifera*  
*Acer glabrum*  
*Alnus*  
*Salix*  
 "  
 "  
*Sorbus sambucifolia*  
*Liparoglyca canadensis*  
*Sambucus racemata* var.  
*Pachystima myrsinites*  
*Betula glandulosa*  
*Zosterophyllum terax*  
*Ribes*  
*Geosulcia*  
*Vaccinium erythrocarpum*  
 " *ovatum*

*Lonicera involucrata*  
" *corjoides*  
*Juniperus communis*  
*Rubus nutkanus*

Transition zone plants

- *Pseudotsuga*
- *Populus angustifolia*
- *Amelanchier*
- *Prunus melanocarpa*
- *Juniperus procumbens*
- *Berberis repens*
- *Arctostaphylos uva-ursa*
- *Balsamorhiza sagittifolia*
- *Gaillardia*
- *Eleagnus argentea*
- *Betula fontinalis*
- *Thuja*
- *Ribes d. irriguum*
- *Philadelphus lewisii*
- *Rubus strigosus*
- *Balsamorhiza*
- *Gaillardia*
- *Lupinus*
- *Ceanothus velutinus*



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8-2887

2,07 sheep counted was Mary Hokers  
in March, <sup>1917</sup> by Walter Scott Gibbs

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