

JOURNAL

1907

Vernon B. ...

MILWAUKEE

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1907

Sept. 8. Left Redlands at 3:30 and reached Barming about 5 P.M.

Sunday and I could not do more than get located and talk over Mabour desert trip with Mr. Barber, who has cattle over there.

Sept. 9. Hired team and man with sled, wide tired buckboard. Got camp supplies and started at 9:30

Reached Whitewater ranch by noon & then crossed Whitewater river and over into Morongo Valley and camped at Chuck Wassen's ranch.

Came 28 miles, over hot desert on one of the hottest days of the year they say at the ranches. Probably 110 or 115.

Crossed several good creeks and found a big stream of beautiful clear water in the river, up to the horse hills.

Struck creosote and full set of desert brush at Cabezan & both kinds of mesquites full of fruit at Whitewater & Wassen's ranches. Found Sycamore all the way except a trace of upper on north slopes of ridges in crossing over into Morongo Valley.

Some Juniper + Quercus laevis on cold slopes.

Camped late and set only a few traps. Shot 2 jackrabbits + 2 Ammospermophilus

Sept. 10, Slept cold at the camp in damp bottom cañon of valley, but soon got warm when the sun came up. Had specimens to skin + got off late. (7:30)

Continued east through Morongo Valley across little Morongo Cr., a fine stream of good water, then over divide at 3300 feet and down into long smooth valley sloping gently east and down it 5 miles to Warrens Well at 2100 feet + camped. Came about 14 miles.

Morongo Valley is all arid Lower Sonoran with the full set of <sup>desert</sup> plants. Cressate, Acacia + mesquites!

Yucca brevifolia begins in the east and runs over the divide into Mohave desert. Cacti are abundant.

There is just a trace of Yucca elata on cold slope of divide and along cold slopes of ridges north and south of Warrens Well Valley. The soil is granite gravel, dry + loose.

Warrens Well is about 5 miles down on the Mohave Valley slope at 3100 feet. The valley is open and slopes gradually eastward past Coyote Holes and on down to 29 Palms some 23 miles still further east.

The ridge to the north 200 or 300 feet higher than valley separates it from the Mohave Desert proper of about the same level as the Well and of the same general character of country.

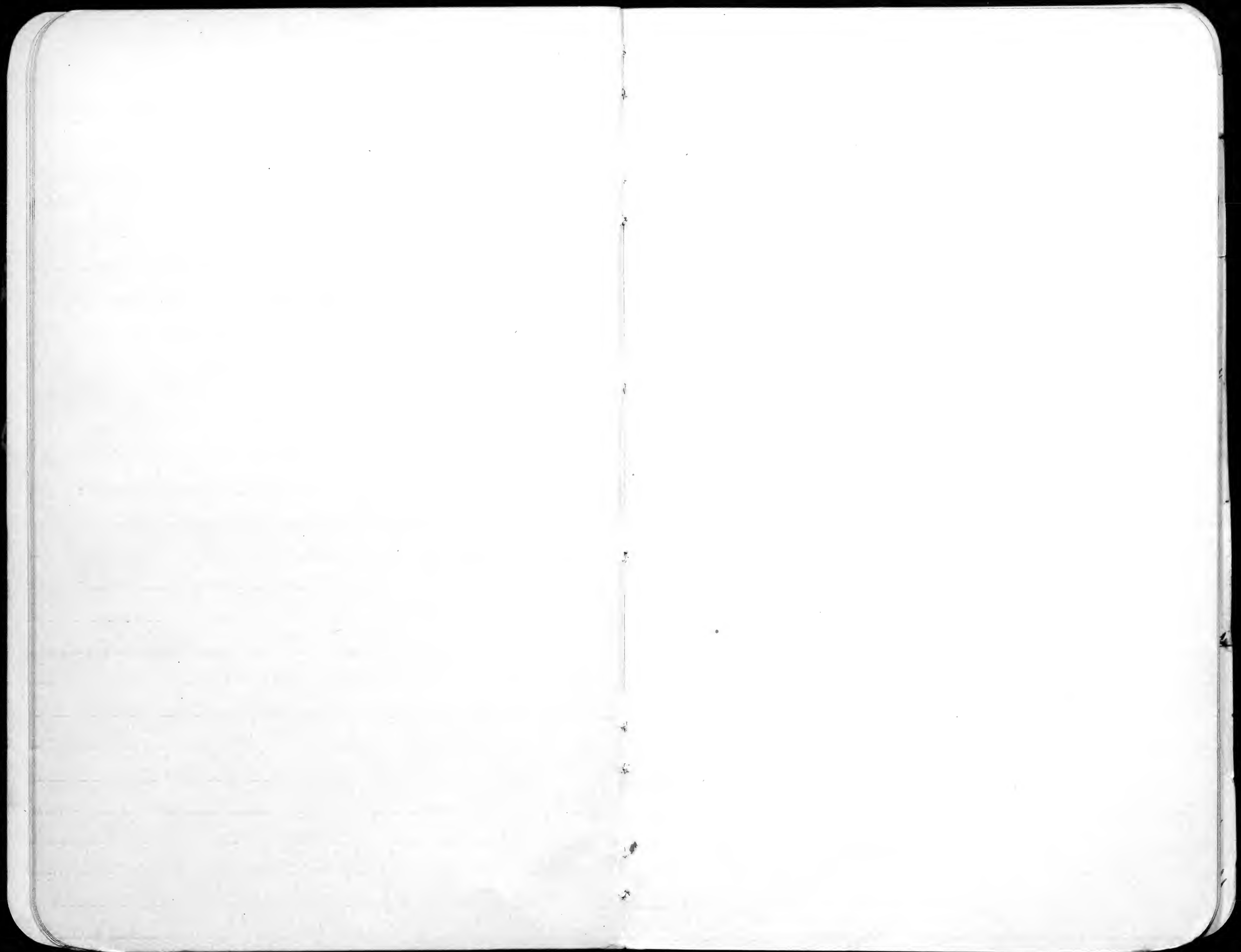
The mts on the south are higher, 1000 to 2000 feet higher than the well and covered on north slopes with juniper & nut pine but no larger timber.

The rock is mainly granite of a coarse texture and the washes are granite gravel. The soil of the valley is firm & good generally and supports a good stand of desert plants. Water is scarce, but that at the well is very good - just a windmill pumps enough for the cattle & for passing teams. A cabin & corral at the well are used by the cowboys & campers.

Warrus Well

Sept. 11. ~~12~~. Trapped and collected about  
the well and got most of the ~~own~~  
manuals & lists of birds & plants.

Sept. 13, Took up traps & started back,  
reached Warrus ranch at 9 &  
Mission Creek at 10 and White  
Water ranch at ~~12:30~~ 1. Camped &  
set traps. Very windy and  
rather warm.



## Arroyo Seco

Sept. 27, Left Pasadena at 9:30 AM.

and followed up the Arroyo Seco to about 2200 feet, then over the ridge and down into Long Canyon at Switzers, then north over the ridge just west of Strawberry Peak and down to Colby's Ranch.

Switzers in 3100, top of ridge, 5500 and Colby's 3500.

After entering the canyon at 1400 feet we were in pure Upper Sonoran zone all day except for a trace of transition on the ridge and north slope of Strawberry Peak. There are lots of *Pinus coulteri* with the *Pseudotsuga mucronata* and in the gulch n.e. of Strawberry are some *Larocedrus* and Mr. Colby thinks some yellow pine. It got dark as we came down the north slope so I could not tell the trees & was pitch dark when we reached Colby's ranch in the Coldwater canyon at 3500 feet. The last mile of steep trail down the slope I followed with my feet more than my eyes.



## Up Tazungo Canyon

Sept. 28 Spent the morning looking over the Colby ranch and talking so did not get off till 9:30. Struck the Tazungo canyon at 3200 feet & followed up it to Alder Creek & up Alder to about 4300 feet, then over ridge to S.E. to the Chillos and camped at 5300 feet, above the cabins.

Entered strongly marked transition zone at edge of Pine flats at 5250 where *Pinus ponderosa* and *jiffeyi* & *Libocedrus* and *Pinus lambertiana* & *coulteri* are in continuous forest with *Artemisia tridentata* below. This is a winding basin and gulch country and above it are pines on cold and choppy or not slopes. *Cyanocitta*, *Sitta pygmaea* & *scutellata* & *Pinus gambeli* & *fungosa* were also common & the small *Thomomys* and *Sciurus nigripes*.

From the ridges I could map transition zone by *Pinus timber* the whole length of the Pacific ridge and down the upper slopes of the peaks and on Pike Mountain and many others without names.

## Mammals

*Odocoileus scaphiotes* - One live & one dead seen in Long Canyon & a head & skin at Colby's ranch. Tracks common in Long Canyon and under Creel canyon and around Colby. Three killed at Colby's this year.

*Ovis* - Colby says he has seen tracks on Shawhorn peaks that he believes are sheep. It is an ideal peak for them.

*Sciurus nigripes*, Common on Pine Flat.

*Titellus buckleyi*, In places all along.

Very troublesome & hard to be poisoned at Colby. One seen dead is slightly *intermediatus*.

*Eutamias merriami*, first heard at 2000 feet in Arroyo Seco Canyon, then common all along.

*Thomomys pusillus* - , Stick houses all along Arroyo Seco

*Thomomys pallidus*, obs. at Colby's in Coldwater Canyon at 3500 feet. Some damage in alfalfa & orchard. Many caught. One fine old male secured.

*Perodipus agilis*? , Tracks common in chaparral up to 5500 feet.

## To Buckhorn Canyon

Sept. 28. Slept cold and got up early, but waited to write up notes & did not get off till 8:45. Struck east over several ridges, each getting higher until we crossed one at 7000 feet & down into Buckhorn Canyon & camped at 6500 feet on the N.E. side of Mt. Waterman. Camped at noon & went to top of Waterman in afternoon & got back in time to set all the traps.

Have been all the way in pure transition zone. Even to the top of Waterman at 8000 there is scarcely a trace of Canadian. No *Pinus murryana* and probably no *flexilis*. *Pinus lambertiana* is very much like *flexilis* when dwarfed & not always distinguishable.

*Pinus ponderosa*, *jeffreyi* and *lambertiana* and *Abies concolor* go to the top. *Libocedrus* reaches to 300 feet below. From Chullas to Buckhorn is about 12 miles over fairly good trail and all the way through beautiful forest of pines, cedar & fir. It has never been cut and not badly burned. There is no chaparral or dense underbrush.

Mt. Islip

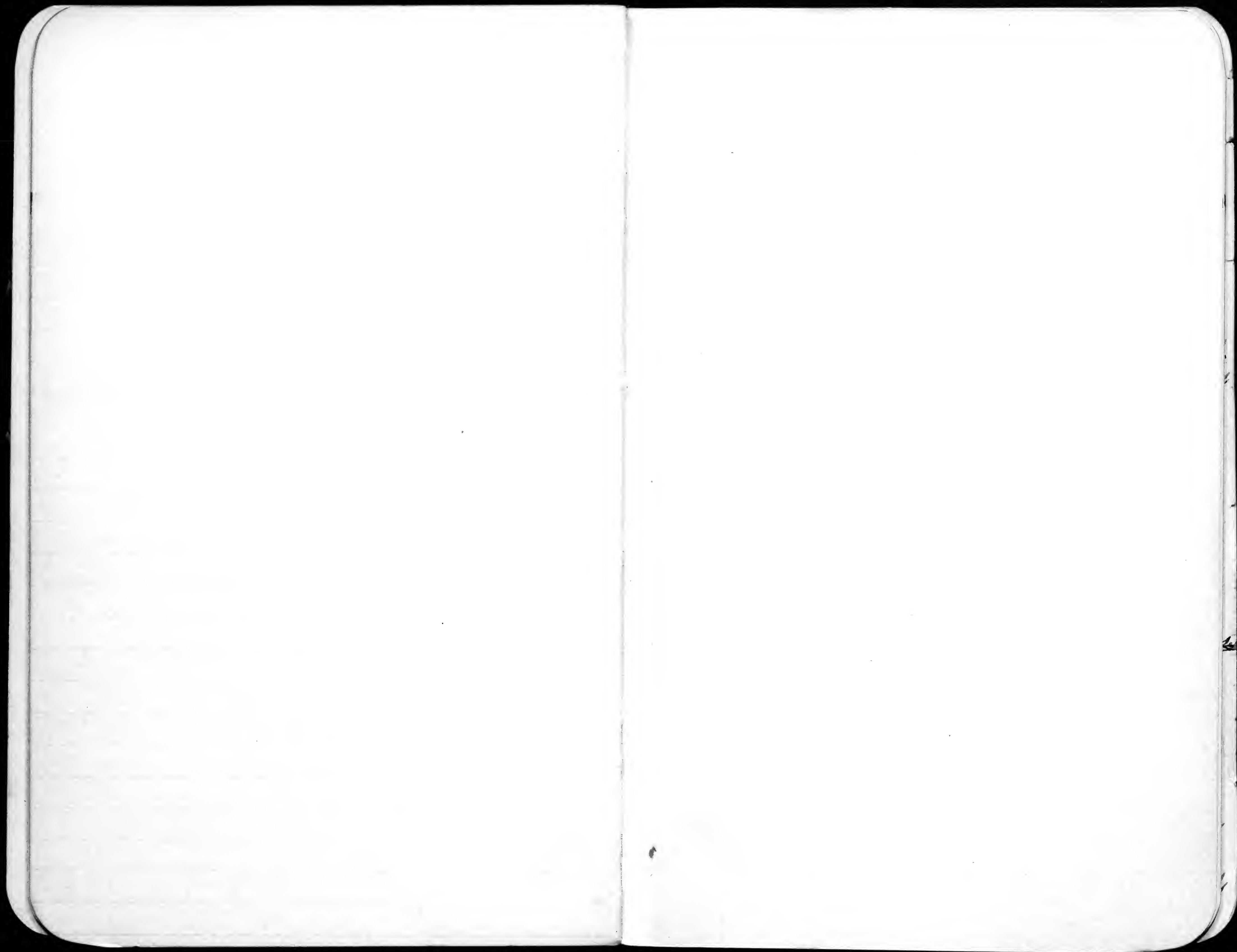
Sept. 29, Followed main divide on backbone of range east to Mt. Islip, over the top of Islip and down to first Siemega on south side at 6700 feet and camped early enough to set out all my traps. Climbed up and down steep peaks and ridges all day varying from 6500 to 8000 feet. Came about 15 miles, all the way in pure Transition zone. The slopes are so steep that most of the timber is scattered! The dense forests have been burned out but the scattered timber remains untouched. The same trees were seen as noted yesterday. No trace of Canadian zone was noted on Islip, but on the peaks east of it there should be some on cold slopes, as they run to 9300. Bird and mammal life is rather scarce. Only 2 spruces were passed today.

Caught *Thomomys perpes?* + *Neotoma lepida?* + *Peromyscus gambelii* + shot *Eutamias* species.

Could map Transition zone on both sides fairly accurately.

To Agusa + Pasadena

Sept. 30. Followed trail down to Squirrel Inn, and road down the canyon to Agusa, where I left Chas. Richardson to bring the horses over in morning, while I took evening train to Pasadena.



Los Angeles to Fernando

Oct. 28, took 2:30 train for Fernando  
+ spent the rest of P.M. tramping  
over wash east + south of town.

Oct. 29. Drove west from Fernando  
about 3 miles, then north across  
valley to Santa Monica Mts.  
and up a canyon nearly to  
summit of range. Got back  
at dark + wrote up report in  
evening.

Fernando to Saugus + Santa Barbara

Oct. 30 took 7:37 train to Saugus and got team + drove several miles up San Francisco + Soledad canyons and got good lists of plants + birds.

Extensive orange and olive groves were seen along the R.R. from Fernando to the tunnel, then upper Sonoran chaparral covered the hills when not burned over.

As we came out at Newhall the valley opens out and is marked by scattered live oak + *Q. lobata* along the sides, and Walnut and sycamores along the dry wash. At Saugus the valley is wider + the bottom open + weedy.

San Francisco valley is a shallow upper Sonoran wash, full of juniper, *Artemisia tridentata*, and mainly upper Sonoran brush.

Soledad canyon is much the same but a little more open and the weedy bottom part may carry a mixture of lower Sonoran some distance up.

The ridges are pure upper Sonoran, covered with *Adiantum*, *Quercus*

densa, *Rhus ovata*, *Prunus ilicifolia*,  
and nearly the whole set of chaparral.  
The wide valley about Saugus and to the  
west is partly cultivated, but in  
waste places has most of the lower Sonoran  
weeds of the San Fernando Valley, such as  
*Erenocarpus utigera*, *Crotalaria californica*,  
*Trichostema lanceolata*, *Marabium vulgare*,  
*Opuntia* (small pads), *Q. borealis* var.,  
and in washes *Baccharis ovina*,  
*Leptospartum aquanotum* etc.

*Quercus lobata* grows abundantly over  
low mesas and foothills, but does  
not come onto the valley floors nor  
on chaparral covered ridges.

Cactus wrens have freshly lined  
nests in many of the cactus bushes  
a mile north of Saugus.



Left Seargeus at 4 P.M. & followed  
down the Santa Clara Valley to the west.  
The valley soon widens & there are  
extensive cottonwood & willow bottoms  
and great patches of *Desmodium*  
and *Phaseolus* *borealis* down as far as  
Moribu Canulus. Here the valley  
begins to be cultivated & has fine  
large groves of Orange trees full  
of fruit, also olives, pomgranates,  
English walnuts, pappi & Eucalyptus  
trees, peach & apricot.

At Piru is a large lemon grove  
of fine trees full of fruit.

The river bottoms are sandy & poor  
& mainly used for meadows or pasture  
land. The fruit zone is along  
the side slopes & foothills below the  
chaparral.

The valley is about the same to  
Fillmore, good orange, lemon &  
grapefruit groves & the other fruits  
that go between - apricots, peaches,  
Grapes, olives, etc.  
Also corn, alfalfa, squashes,  
melons & vegetables.

At Suspe the hills rise higher & steeper to the north and are crested with long arched spurs of *Pseudotsuga macrocarpa*. *Rhus lucida* and live oak & *Opuntia littoralis* come down on the washes. The soil is dark & rich and there are large fields of grain & beans & less fruit.

A few miles west of Suspe the citrus fruits have ceased but peaches, apricots & English walnuts are seen. Olives & grapes are still raised but the wild vegetation becomes more dense & the chopousal comes lower down as we near Santa Paula.

Just west of Santa Paula there are good orange groves again & lots of olives & English Walnuts & other fruits, but it soon got too dark to recognize the trees.

## Santa Barbara

Oct. 31. Got a saddle horse & rode up past the old Mission, to the stone chulabas quarry & tunnel & then up the trail to summit of Santa Ynez Mts. and along ridge to highest peak, 3987 feet.

I had no aneroid or contour map but by dividing the slope slope into halves & quarters could estimate approximate altitudes.

The lower 500 feet of the slope is largely open country with scattered live oak and tongues of chaparral in the gulches. Parts of it are cultivated and groves of oranges, lemons, grapefruit & olives grow up to its upper edge. Also, a great variety of <sup>various</sup> native trees and shrubs.

Above this the upper European Chaparral begins and runs to the top of the range is a dense mass, impenetrable except along trails. A large amount of northern species occurs here, or species that do not go much farther south.

To San Francisco

Nov. 1, arrived at San Francisco about 9 A.M. and worked on plants the rest of day and most of the time for several days, getting our summer's collection identified and labeled and the names worked into our reports and note books. Miss Miss Eastwood came over and helped us one half day and we went to the Berkeley herbarium and worked with Prof. Hall another afternoon. We lunched at the Faculty Club with Mr. Gilbert and met Prof. Siebelt, Prof. and Prof. Hall. Also Prof. Ritter and Dr. J. C. Merriam & President Wheeler and a lot of other interesting people. Dr. Ward, of the bacteriological laboratory told me of 15 cases of bubonic plague was Berkeley & San Francisco in which the men had been out shooting and had carried home ground squirrels (*C. beecheyi*) in their pockets. It is suspected that the squirrels were affected by the plague & that their fleas conveyed the disease to the hunters. The Marine Hospital people are studying the

problem in relation to both spermozooids  
and rats. Mr. Ward tells me that  
the plague bacillus can be positively  
determined without much difficulty, that  
a slide made as a smear of blood from  
the throat glands of a diseased animal  
gives a fair test but that a  
final proof should be made by  
inoculation of another animal.  
He says the bacillus could not usually  
be recognized in an animal that  
had been dead over 24 hours, and a  
fresh specimen is best.

Dr. J. C. Merriam's fossils from  
the asphalt beds near Los Angeles are  
wonderfully preserved specimens including  
some nearly complete and perfect skulls  
of saber-toothed tigers, huge wolves  
larger than any living species,  
small wolves, and many other wonderful  
mammals.

Berkeley University is a  
delightful place and the Faculty Club  
under the old live oaks a charming  
spot.

To Lovelock, Nev.

Nov. 6 Left San Francisco at 6:20 PM, for Lovelock, Nevada where a "Plague of Voles" is reported.

Nov. 7. Daylight at Yreka, then yellow pines and transition zone to Reno, Upper Sonoran began good and strong below the meadows at Sparks, but the big meadows filling the bottom of the valley from Reno to Sparks and 2 miles beyond is probably transition, simply because a damp, cold meadow. The train missed Wadsworth and went down the south side of the valley & then over the mesa to Hazel and around by the Carson Sink, over desert meadows subject to the ditch but not yet reclaimed. Many stanties had a few fences as up but the ground is still bare and dry. The whole valley looks even more brown and bare than I remembered seeing it before. The lakes and salt marsh are about as I remember them.

Reached Lovelock about noon.

In afternoon drove out to the Reservation, as it is called - Rogers Ranch, and found Mr. George S. Webb, the warden. Together we went out over fields that had been alfalfa but are now a porous mass of *Microtus* burrows and mounds, so close together that one mound is entered by 2 or 3 burrows and the earth from one burrow fills two or three others, or would if not thrown back. One put case into the honeycomb and almost every bunch of alfalfa remaining has a burrow or two against its roots and is being rapidly consumed for food.

Large fields have been almost denuded of alfalfa and many are being plowed up. Mr. Webb says the crop on the Rogers Ranch is 1500 tons short on account of the mice. This year ~~but~~ the after effect will be more serious next year.

Alfalfa is now worth 12 or 13 dollars a ton at Lovelock. Last year the crop on the Rogers Ranch was about 10000 tons. This is all fed to stock

during winter, mainly cattle and  
sheep for the San Francisco market.  
The ranch contains 4000 acres,  
largely in alfalfa. The soil is  
rich, heavy alluvium and yields  
large crops. Not half of the valley  
however is under cultivation and  
as usual the large ranch methods  
of farming are not very economical.

On the way to the ranch I picked up  
a dead jack rabbit on the road that was  
a fairly good specimen. Saw also a  
dead Coyote & on my return saw a  
live one out in the field hunting mice.  
Pocket gopher hills are very large and  
very numerous in places. The Microtus  
seen to be montanus, but many small  
gray individuals may prove to be nanus.

Saw many Buteo borealis calurus &  
swainsoni in the cottonwoods along  
the fences and flying over the fields  
or sitting on the ground. Saw a few  
Archibuteo lagopus sancti-johannis and  
several Accipiter cooperi among the trees  
or flying over the fields. Saw one  
Falco mexicanus skimming over the fields  
close to the ground like a warble hawk.



Saw several marsh hawks in their usual  
pursuit. Saw a large flock of gulls  
in ~~the~~ one of the large fields ~~on~~ the  
ground and many were circling low  
over the fields. Ravens are common  
and many were seen on the ground  
out in the fields, chasing & eating mice.  
Magpies were common along fences,  
in cottonwoods & willows and out  
in the fields, sometimes following a plow  
or lighting down and hunting on their  
own account. Small birds are  
scarce, a few sparrows and Otocoris  
were heard. One shrike, that looked  
large and dark enough for bovialis, was  
seen on the fence.

On returning to town I laid  
in a stock of poisons, Cyanide,  
phosphorus & arsenic, and wired for  
barium carbonate. I have plenty of  
strychnine.

Nov. 8. Mr. Webb took me out to the Ranch to stay while doing my work on *Microtus*, and on the way at drove over another large ranch where they are poisoning with phosphorus. For several days men have been at work putting out the poisoned wheat and now the dead mice are scattered over the ground in thousands. Still there are many alive and many sick ones were seen, too stupid to run.

In places I could pick up 10 or a dozen to a square rod lying on the surface while probably more were dead in the burrows. Still there were others alive, but these would probably get some of the remaining wheat.

The men told me they were putting about 16 bushels of wheat on this field of, I should guess, 40 acres. They were sowing it broadcast in strips up & down the field, <sup>almost</sup> as thick on the ground as if seeding.

The phosphorus is put up in 3 oz. bottles in a liquid preparation by the local druggist here and sold at 75¢ a bottle. One bottle is

added to a bushel of soaked wheat  
and distributed while wet. It seems  
safe and simple to handle in this  
way and was being distributed by  
3 dull looking Scandinavian workmen.  
Two or three bushels of the wet and  
poisoned grain were placed in a  
big box on a low sled and a boy  
drove the horse slowly while the  
2 men scattered the grain. Each  
had a large tin pail. These were  
filled with a shovel and carried  
on the left arm while with a  
big spoon the grain was scattered  
as the men walked. It was  
not intelligently done and as  
much was scattered over salt grass  
ground where were no mice as in  
the worst infested spots.  
It would take 2 or 3 times as long  
to put the grain down the burrows  
but this would prevent much of  
the danger of poisoning stock &  
birds. I am told that the waggies  
die of eating poisoned mice but  
suspect they eat the grain as well.

We then went over a field where the Pasteur virus had been put out about 3 weeks ago and found no dead or sick mice, but lots of live and healthy ones. Still a few of the burrows seemed to be closed or unused and a few of the mice may have been killed. Mr. Webb had put out the virus in this field, hoping to inoculate the mice so thoroughly as to exterminate them.

Then returning to the ranch I got out my materials for work and after dinner went with a man who is plowing up a ruined alfalfa field with a double sulky plow & 8 horses. The book keeper, Paul Reed, went with me & each with gloves on and a coal oil can in the left hand we started after the plow, catching the mice as they were turned out of the furrows and ran and putting them in the can. After 15 minutes lively jumping and scrambling we were out of breath & panting & tired but had as many mice as our cans would hold without being

P.S. Later one bit my thumb through a heavy leather glove till the blood ran in a stream.

P.S.  
Another square rod had 161 burrows on it and thousands of rods <sup>or more</sup> have them just as numerous.

smothered by their own numbers. On counting up we had 51 in my can and 34 in his, or a total of 85 mice caught in 15 minutes in our hands. At this rate I could catch 200 mice to the hour, or in 10 hours 2000. With a long handled dipper one could catch them faster & easier. They could not bite us through heavy leather gloves, but would stand up and fight valiantly & bite as deep as they could into the leather.

The 85 & 11 were put into 5 cages and given preparations of arsenic on sugar bits, wheat & cracked barley and cyanide of potassium on sugar bits & barley.

I measured off a square rod of the field and counted 134 burrows on it. This is about a maximum but on a scattered place I counted 54 on a square rod which is about the minimum.

A large lot of pellets made up of microtus fur & bones were gathered up where the gulls sit during this

resting time and another batch  
under trees along the edge of the  
field where hawks & owls sit.

The birds seen today were:

Archibuteo sanctijohannis, at least 4 were  
seen in the trees along the fields or  
out in mouse infested fields.

Buteo b. calurus - Red tail hawks are  
unusually common over the fields,  
or sitting on the ground or in the  
trees along the fences too full for  
action. In the evening as they flew  
out of the trees their crops were so  
stuffed out as to land conspicuously  
as the hawks flew.

Bubo swainsoni - a few were seen along  
the rows of cottonwoods bordering the  
fields and others flying over  
the fields. They are slightly less common  
than the red tails.

Cereus hudsonicus. A few marsh hawks  
were seen skimming low over the fields

Bubo - A great horned owl came  
into the cottonwoods close to the ranch house  
in the evening, but paid no attention to  
the chickens, ducks & turkeys under the trees.

Larus delawarensis Gulls were busy flying over the fields all day when not sitting in flocks on the ground waiting for digestion to make way for more mice. At one time I counted two flocks of 24 and 53 sitting on the ground while others were circling over the field. This was in about a 40 acre field where the mice have ruined the alfalfa crop. The gulls are often seen diving to the ground for a mouse and many a quarrel takes place over the prize. The mice are gulped down whole, so little time is wasted. On the roosting grounds lots of pellets of mouse hair and bones are found & the gull pellets can be distinguished from those of hawks & owls by their open, scattered form. Apparently a gull picks part of the bones out of a pellet after it comes up & so tears it open. Gulls often are seen chasing mice on the ground and evidently catching them by help of wings and legs. A sudden flushing in some part of the flock of sleepy gulls, a rush and flutter of wings indicates

Nycticorax, Black crowned Night  
herons came into the field after 4 P.M.  
until sundown, or as long as I staid.  
I counted 12 in one field, flying in or  
sitting like soldiers with drawn sword  
watching at Microtus burrows. I watched  
them creep up with bill poised ready  
to strike but did not actually see one  
spear a mouse.

Zootheryx - Quail were heard  
calling in the greasebrush back of the  
ranch buildings.

Corvus sinuatus - Ravens are common,  
and almost constantly heard or seen  
over the fields. They are often seen  
on the ground watching at burrows  
or picking at mice which are torn  
to pieces before being swallowed.

They seem to catch the mice by watching  
at the burrows or by a quick short run.  
Probably 25-30 ravens were seen during  
the day.

Corvus americanus - Crows are much  
more numerous than the Ravens and  
seem even more active in pursuit &  
capture of mice. Fifty to a hundred  
crows are often seen in an 80 acre



field, scattered out singly or in small  
squad, chasing or eating mice. They  
are often seen carrying mice in their  
bills while flying but more often seen  
tearing the mice to pieces on the ground.  
I have seen 3 or 4 thus consecutive few  
posts, each tearing up a microtus  
and eating it bit by bit.


Pica pudsonica - Magpies are numerous  
and constantly seen in the fields,  
or on the fences or in trees or brush  
along the edges. They hunt systematically  
over the fields, one in a place, but  
apparently with great success. They  
are often seen carrying microtus or  
eating them on the ground or a post.  
They also come to feed with the chickens  
in the morning and are seen picking  
around the slaughter yard and old bones  
thrown out, but most of their time is  
spent in the field & Microtus seems to  
be their principal food.

Euphagus cyanocephalus - Brewer's blackbirds  
are common in the fields especially  
on plowed ground. I have not seen  
them hunting or eating mice, but presume  
they find grubs or insects plowed up.

There seem to be no grasshoppers or other insects out. There have been heavy frosts and most of the insectivorous birds are gone.

Otocoris - Horned larks are common in fields and along roads.

~~In evening I went over to the nearest neighbor Mr. Aufer, who has lived here 30 years and has a ranch of 620 acres, mostly in alfalfa. He estimates his loss this year by the river at 600 tons, \$5000. Last year he cut 2500 tons of hay and this year only 1200, but he attributes part of the shortage to the late, cold spring. He is plowing up some of his best fields where the alfalfa is killed out by the river & will put in grain next year. He thinks the loss will be much greater next year from the damage all ready done.~~

Oct. 9. In the three arsenic tests on wheat, barley, and sugar beets the mice were all dead in the cases this morning but one. In the two tests of cyanide on wheat & sugar beets none of the mice were dead except a few that had probably been hurt & were eaten up by the others. So I mixed a peck of <sup>put</sup> wheat & peck of wet cracked barley with half a pound each of dry arsenic and cut up a quart of sugar beet cubes  and rolled in arsenic & put out in the field. The wheat & barley each covered about an acre, distributed in burrows & runways, and it took two of us half an hour to put out each kind. The result remains to be seen, and two nights should be allowed for definite results.

My baggage came & I set a few traps for gophers and took some photographs. Carried out the dead *Microtus* & had them plowed under & caught a fresh lot of live ones. With a tin can in one hand & gloves on I followed the plow for 35 minutes & caught alive 127 *Microtus*.

The same birds as yesterday were seen  
and a few others.

Larus delawarensis - 165 gulls were  
counted at one time in two flocks  
on the ground and others were  
flying around over the field.

The gulls have been here for a month  
or more Mr. Webb says.

Archibuteo sanctojohannis - In a field  
two miles from the ranch house  
I counted 10 Roughleg hawks fly out of  
one line of trees as we drove along  
and probably 20 were seen sitting  
on the ground out over the fields.

All seemed full and stupid.

Many of the hawks were in beautiful  
plumage with black bellies & white  
head & cape and basal half of tail  
but no ferruginous was seen on  
any. Many were close by and the  
glass showed them up distinctly.

Falco mexicanus, One seen sitting on  
a gate in pig field. He was very  
tame and stupid for his kind.

Falco columbarius - One seen on a fence  
in a large field.

Canis latrans a coyote was seen at about 5 P.M. hunting in an alfalfa field. It was walking cautiously about & evidently hunting mice, but I did not wait long enough to see it catch one.

Mephitis - While catching mice I found a dead skunk in the middle of an 80 acre field and saved the skull. Another skunk was scented by the roadside.

Flonomys nevadensis Gophers hills are numerous & big. The ranchman says they could not raise any alfalfa if they did not drown out the gophers in irrigating. Still they have come into the fields & are doing great damage now.

Falco sparverius - A fine adult male was seen on a fence but I had no gun & did not ask him what he had been eating.

Circus c. hudsonicus, A few marsh hawks were seen over the fields.

Euphagus cyanocephalus - A large flock of several hundred were sitting in the cottonwood tops near the ranch just after sundown.

Zayornis saya, One seen on fence.

Colaptes cafer, two were seen in the orchard.

Junco - Juncos are common in the orchard but bordering brush patch.

Mirula m. propinqua - A typical western pale robin was seen in a ditch near the house.

In the evening I went over to the ranch of our nearest neighbor, Mr. P. Anker, who has been here for 30 years, and has a ranch of 620 acres, mostly in alfalfa. ~~He~~ estimates his loss this year by the mice at 400 tons of alfalfa, or about \$5000. Last year he cut 2500 tons of hay and this year only 1200 tons. But he attributes part of the shortage to the cold, late spring. He thinks the loss next year will be far greater than this from the damage already done. He is plowing up some of his best fields of alfalfa and will put in grain next year and if the mice have left will seed to alfalfa later.

His potato patch was nearly ruined by the mice and where he should have had 6 tons of good potatoes he gathered about a ton of damaged potatoes.

Knowing Mr. Anker to be an old resident and a very reliable man I went over especially to ask him if such an invasion of mice had

ever occurred before. He said it had only once in his 30 years here. A similar, not equally destructive wave of mice began in 1899, reached their greatest abundance in <sup>the fall of</sup> 1900, and suddenly disappeared about March or April of 1901. He figured out the dates very carefully and they agree with what others had previously told me in less detail. He says the alfalfa crop was practically ruined and the land had to be reseeded.

Many people poisoned extensively at that time, but did not succeed in saving their crop, while those who did not poison were so much ahead.

Mr. Antler also tells me that the gulls "have always been here" and that they fly over the fields all summer, especially when the land is being irrigated. He thinks they stay most of the winter.

## Rogers Ranch

Nov. 16. Caught a few gophers & photographed the gulls in the field. In P.M. went over to where we put out the poison yesterday and found 4 dead mice along the strip where Phosphorus treated wheat had been put out. Also found one little pile of wheat (about a teaspoonful) smoking & on touching it with a stick it burst into a blaze.

One sick mouse that died in about 5 minutes was found where arsenic poisoned wheat had been put out, but none were found where the barley & sugar beets were distributed. The grain & beets had been partly eaten but I think the mice die in the burrows instead of coming outside as they do from phosphorus poison. Tomorrow we will dig open some of the burrows to see.

Saw other fields where the mice were as abundant as usual and in one field of barley stubble they are numerous. They seem to live on the dry stubble & what grain was scattered.



Saw no new birds but an unusual number of rough legged hawks, probably 50 or more in the trees along the roads or sitting on the ground out in the field. All of the birds previously noted seem to be more numerous and cover new territory.

The microrats in the cages to which I had fed some of the <sup>Italian</sup> poisoned wheat & barley had all died, while those fed phosphorus poisoned wheat were about half dead. It is probable that too much phosphorus was used and the taste or odor was offensive & hence it was not eaten.

I had about 100 dead mice to carry away, but saved the heads of a lot of the males and examined probably 50 females to see if they are still breeding. Not one showed signs of pregnancy, and I have not seen any young less than one third grown, or probably a month old. The breeding season seems to be entirely over & I would not be surprised if the birds prey on

them would practically exterminate  
them before the breeding season  
begins again in probably April.  
If half the mice were poisoned the  
birds would surely do the rest.  
Coyotes are also numerous and must  
consume great numbers of the mice.

## Rogers Ranch

Nov. 11, Made up *Thomomys* & *Microtus* skins till noon when Mr. Webb returned with the Barium Carbonate, then mixed poisons and fed the mice in cages and later took wheat prepared with it to the field and distributed about 1/2 quart on about an acre, putting a teaspoon full of wheat down each fresh and well used burrow. I mixed half a pound of the Barium <sup>9 half a pound of sugar</sup> with 1/2 quart of wheat which makes ~~it~~ <sup>it</sup> six times as expensive as arsenic. Some of the ~~same~~ preparation was fed to 12 mice in a cage and in other cages were placed a stronger mixture and also Barium on sugar beets. This was put in the cages about 1 P.M. but only one mouse (with the wheat) was found dead before dark.

In the field where phosphorus was put out day before yesterday 4 dead mice were found at 2 and 3 rods from the wheat.

In the area where arsenic poisoned sugar beet cubes were distributed day before yesterday one dead mouse was found on the surface, but none were

P.S. Nov 13. The sugar beets were not touched tho they have been out 2 nights. The coating of arsenic was very thick on them & may have prevented the mice from eating any.

found by digging out several burrows. When the arsenic poisoned wheat was put out day before yesterday we dug out several burrows and found in one nest at the bottom of a deep cavity 2 dead *Microtus*.

Their stomachs were full, mainly of green alfalfa, but in each was the ground up remains of wheat to the amount of about 2 kernels. Possibly only one. Evidently the mice poisoned with arsenic go into the burrows to die. A few live mice were seen running about on the area where the poisoned wheat & beets had been put out but not half so many as on the next block where none had been distributed. There are not so many freshly used burrows either on the poisoned area.

A new line of poisoned beets ~~not~~ sliced long and rolled in dry arsenic were distributed along a populous ditch bank. These pieces are too large to be eaten at once & the amount gnawed out of them can be seen each day.

P.S. next morning.

Barium: All 3 mice were dead in morning.  
If the Barium killed them it works very slowly.

P.S. next morning.

Apple: Considerably eaten, 5 mice dead, 1 alive.

Potato: Not much eaten but 5 mice all dead.

Cabbage: All 4 mice dead. Not much eaten.

## Rogers Ranch

Nov. 12, Only about half of the microtus fed Barium Carbonate were dead in the morning and these were partly eaten & may have been killed by the others. Later in the day <sup>10 AM</sup> a freshly killed mouse was eviscerated & filled with barium carbonate & put in a can with 3 live ones. It was promptly eaten and a large part of the ~~the~~ poison taken but at 5 P.M. the 3 live mice showed no symptoms of discomfort. Barium seems worthless.

At the same time another was well filled with arsenic & put in with 3 live microtus and in 2 hours 2 of the three were dead, & the other was dead in morning.

Others were put in cans and fed apple, potato, Cabbage, ~~the~~ onion & beefsteak with dry arsenic scattered over them. The apple was quickly eaten as in that can the mice were hungry & had little to eat all night. In 2 hours one was dead & in 5 hours 4 more. ~~Some~~ Considerable of the potato was eaten but ~~one~~ of the mice died before dark.

The cabbage was not eaten for some time, but by 5 o'clock 2 of the mice had died and others were affected.

P.S. Next morning.

Onions: In the morning little had been eaten and of the 7 mice 2 were dead & 5 alive.

Breadstake: Edges eaten & all 5 mice dead.

Cabbage: In the morning cabbage not touched by mice.

Food mice: The 4 poisoned mice were not touched.

Apples: Some eaten from nearly every piece.

Potatoes: Many pieces had been eaten and one dead mouse found beside a piece of poisoned potato.

Onion: Not touched by the mice.

The onions were not eaten at first but at 5 P.M. some had been eaten and 2 of the mice were nearly dead.

The breadstake was not eaten until late, but at 8 P.M. the edges had been eaten all around tho the mice were all alive. Morning will show the rest.

A pan full of fresh cabbage was sliced and covered with arsenic and put out in the field where microtus are thick.

Four microtus were vivisected & opened to the skin & filled with arsenic & put down burrows in the field & marked with stakes.

> A sliced apple was rolled in arsenic & put in holes along a ditch bank.

A sliced potato was put out in the same way.

A sliced onion was also put out in the same way.

In afternoon Mr. Webb drove down to the end of Humboldt lake with me to see if the mice were numerous down there and in the tule & wild land. It is about six miles to the lake.

Microtus were numerous in the alfalfa fields down about 4 miles, then a mile of salt grass and quince brush intervened where there were few or none. Then a big alfalfa field had no mice except a few here and there along the ditch banks. Over the flat salt ground there was no trace of mice but on the mounds out near the mud flats there were a few fresh burrows & trails, about the normal number for such localities. There are no tules at this end of the lake until far out in the water. Last spring the water was unusually high and came up among the ranches but has gone back to near its normal level.

The mice evidently have evidently entered the alfalfa fields from surrounding country and multiplied under the favorable food and cover. It evidently is not a migration, as desert country surrounds the valley. They are said to be numerous also up at Winamucca & Battle Mountain.

Large flat mounds are seen over much of this flat valley

that has recently been lake bottom.  
They are most numerous down near  
the edge of the wet ground and come  
out into the edge of the water.

They are usually 4 to 10 feet high and  
50 to 300 feet across. Some are  
sandy, but most are of black  
mud, rather moist & often encrusted  
with soda. The valley soil is generally  
black, rich, heavy alluvium.

Many flocks of wild geese were  
seen along the edge of the lake, probably  
2000 birds at least.

Gulls were seen in another field  
that is being plowed about a mile west north  
of Mr. ~~Thomas~~ Anker's field. I counted  
176 in it at one time, on the ground  
& on the wing.

Many purple finches (not portalis) were  
seen along the fences, & a few Zenaiduras  
and Ammodramus. Also, many  
redwing blackbirds & 2 sparrows & a few  
meadow larks. No other new birds.



## Rogers Ranch.

Nov. 13. The mice had not touched the onions or cabbage put out yesterday but had eaten some potato + apple poisoned with arsenic + one dead mouse was found close beside the potato he had been eating.

The line of sugar beets rolled in arsenic + put out 2 days ago were not touched. They were heavily coated with dry arsenic.

The wheat poisoned with Barium carbonate 2 days ago had been largely eaten but no dead mice or scarcity of mice could be discovered.

On the area where wheat poisoned with arsenic was put out on the ninth one dead mouse was found and the burrows freshly used were scarce. Much of the wheat has been eaten.

On the area where arsenic poisoned cracked barley was put out the 9th 7 dead mice were picked up + most of the grain had disappeared. The freshly used burrows were scarce, compared with those before the poison was put out.

Went to town but the 8:20 train was 7 hours late so staid over for morning train.

To Hazen & Fallon.

Nov. 14, The 6:40 A.M. train did not come until about 11 A.M., so I wrote on report and examined a big field close to town that is full of Microtus. Also talked with one of the county commissioners who owned the field and who told me that the mice were just as bad to where the valley narrows up 5 or 6 miles north east of Lovelock. He also said they were reported as numerous at Cosgrove and in the valley north of Winnemucca. He said a few of his apple trees had been gnawed and killed and he was afraid more would be killed during the winter.

Reached Hazen about noon and Fallon about 2 P.M. and went to the Hotel Fallon. Telephoned Mr. Means but was not able to see him.

Fallora.

Nov. 15. Mr. Means (Engineer in charge of the Turkey Carson Project) took me out over the valley and showed me many places where the gophers had cut the ditch banks, or rather where gopher holes had caused the water to cut through the banks and do a great deal of damage. We struck one fresh break, which a gulch a foot wide & four feet deep had run cut through the bank and ~~into~~ across the road. This was photographed as also several other breaks and sets of gopher hills in the ditch banks. Many burrows of *Perodipus*, *Dipodomys* and *Onychomys* were found in the banks but these are less extensive and not very dangerous. Mr. Means says that last year one of the big canals broke out, probably through a gopher hole, and it cost about 500 dollars to repair the break. If the country was under cultivation such a break would mean immense loss.

The development of this immense valley of rich agricultural land is going to bring up a lot of problems in useful and injurious species of mammals to be destroyed or protected.

A little bulletin on the species, their habits, etc for these valleys would be timely now and Mr. Means thinks it would be appreciated.

Nov. 14 Reached Blue Canyon at daylight  
and Sacramento at 11 A.M. and  
stopped at Davis to wait for  
the train north from San Francisco  
at 5:40 P.M.

Was rather surprised to find  
oranges, lemons and grape fruit  
trees in many of the yards in towns  
full of nearly full grown and in  
some cases ripening fruit.

None of the trees were very large but  
all were well loaded with fine  
fruit. Peach, apricot, almonds  
and many kinds of grapes are also  
raised in towns at ranches.  
The most of the valley is big  
grain fields. Wild spreading  
oaks (*Q. lobata* evidently) are  
scattered over the valley in places.

To Grants Pass, Oregon.

Nov. 17 Daylight began to break at Edgewood but we did not get a clear view of Shasta until near Agnes. There is not much snow on it for so late in the season. The Zosterophyllum were mostly in clouds but the valleys were clear. At Ashland we got the usual fine flavored apples. ~~and~~ the valley from Ashland to Madras and Table Rock is a good farm and fruit valley with a mixture of Upper Sonoran and transition zones. There is an abundance of Arctostaphylos, Sanicula cuneata, Ceanothus thyrsiflorus?, Amelanchier filifolia?, but these are mixed with Pinus ponderosa, Lambertiana, Pseudotsuga, Larix laricina, Arbutus and other transition zone species.

Nov. 18 Left Grants Pass at 11:30

The same mixture of Upper Sonoran & Transition zone species continued beyond Hugo, but gave place on the Tunnel & ridge to mainly Douglas spruce and on the north side of the ridge some Abies lowiana. At Island Cornus nuttallii and Anemone cordulata were first seen.

### Wolf Creek

A few patches of Anemone cuneata <sup>& Thymiflorus</sup> and Arctostaphylos grow on hot slopes and a few Pines ponderosa & Sugar pines & Quercus kelloggii, but most of the timber is Douglas spruce, with some Abies lowiana. ~~Pines~~, Deer macrophylla & Alder.

### Tunnel No. 8

After passing through tunnel No. 8 the timber is mostly Pseudotsuga and Abies lowiana until we come out into the more open valley, where a few Pines ponderosa - sugar pines & Libocedrus are seen. We soon reach Glendale in a narrow valley with sawmills and a few small cleared farms. Most of the country is heavily

Glendale

timbered and the cold slopes seem to be all Canadian zone while the warm slopes & bottoms are transition or a mixture of the two. We followed up Glendale Creek to the head of the pipe line, half a mile at least on N.E. gulch in a beautiful forest of *Pseudotsuga* and *Abies borealis*, with ~~scattered~~ scattered *Taxus*, *Castroopsis chrysophylla* trees, *Quercus densiflora*, *Alnus*, and a few *Ulmus macrophyllum* for timber. The smaller shrubs & plants are *Vaccinium microphyllum*? (tall), *V. ovatum*, *Gaultheria shallon*, *Berberis nervosa*, *Linna borealis*, *Ceanothus velutinus* (big, 10 ft high), *Rubus nutkanus* + *leucodermis*, and lots of ferns, moss and sarsil.

The transition zone species in the valley are *Quercus kelloggii*, *Q. chrysolepis* (one tree only), *Pinus ponderosa* (a few), *P. lambertiana* (a few), *Libocedrus decurrens* (a few), *Arbutus*, *Ulmus macrophyllum*, *Ulmus* (little leaf), *Populus trichocarpa*, and *Cornus nuttallii*.

All trace of Upper Sonoran seems to have gone



There is a mixture of Canadian and transition but with a mild winter climate that modifies both zones.

Roses and honeysuckles are in flower in the dooryards as well as asters & Chrysanthemums. Grass and alfalfa and many tender plants are growing, fresh & green.

The winters are said to be very mild with practically no snow to remain on the gravel in the valleys.

The summers are said to be delightfully cool.

A little farming & fruit raising is done in the valley but tillable land is scarce.

A dust hole was seen near the town & there are said to be lots of deer, some bear & mountain lions.

A few Thompsons hills were seen on the flats near Glenfeld, but none on the ridges or in the heavy timber. *Distansia townsendi* and pine squirrels are common.

Bluebirds, juncos & English sparrows were eating woodbine berries from vines on the porch. One mountain quail was seen & a Cooper's hawk & edwards & cedar birds

Glenade to Portland.

Nov. 19. Leaving Glenade at 12:30 we wound along the narrow canyon of Cow Creek with dense forest up the steep slopes on both sides. A mixture of Canadian & Transition zone species run through the canyon, one predominating on a cold slope, the other on a hot slope. until we near the Mupqua Valley. Here it opens out at Glenbrook and at Biddle is a wide farm valley full of good fields and orchards. *Pseudotsuga*, *Abies*, *Larix*, *Castrospora*, & *Vaccinium microphyllum* & *ovatum* are vastly left behind in the canyon while *Panachroa pinn.*, *Quercus kelloggii*, <sup>*californica*</sup> *Madrova*, *Maple*, ash, and *are* the principal trees along the edges of the open valley.

The fields show vastly plowed ground & orchards. Apple, peach, plum & pear orchards are extensive and thickly & some of the apple & pear trees are still loaded with fruit.

After crossing the Mupqua River at Myrtle Creek, a few patches of *Ceanothus cuneatus* are seen on

stup, bare, hot slopes but no other  
signs of upper Sonoran zone plants.

Along the river banks grow  
*Populus trichocarpa*, *Alnus*, *Salix*,  
and *Taxus*.

Flourish hills are common in the  
Muppesa valley but gophers could not  
live in the timbered mountains along  
Cow Creek canyon.

Crows & blackbirds are common.

To Lake land and Drain the  
country is similar but high, timber  
covered hills begin at Drain, too  
too dark to see what the timber  
is

In crossing the ridge north of Drain  
I could not recognize the timber  
owing to darkness & rain.

Reached Portland at 11 P.M. &  
went to Oregon Hotel.

Nov. 20. Got a lot of accumulated  
mail and wrote letters.  
Left at 11:45 A.M. on N.P.

Tacoma to North Yakima.

Nov. 21. Got into Tacoma at about 5 AM and left at 8:15. Warm & raining. Grass fresh & green but many of the common plants dead & dried up.

Lots of berry fields and apple orchards, some hop fields.

Followed up slope through heavy timber but rain & snow & dirty windows hid the view for any detailed notes.

Struck snow at 2400 feet & had it over the summit about 4 inches deep and some down to Eastern on the east slope at 2150. Then no more snow and a few miles past Eastern *Pinus ponderosa* begins and grows more abundant. At Cleelum it is the dominant tree the aspens & alders grow along the bottoms. The high mountains are all hidden by clouds, tho at Cleelum we leave the rain and fog.

About half way from Cleelum to Thompson the country opens out with big yellow lava hills on the north & black timber on the south but with pines and cottonwoods along the river bottoms. There may ~~be~~ be a touch of upper Sonoran on both

slopes, but in general the country is transition to Flacke + beyond. At Lutes (1400ft) the snow began to show on slopes above and at about 2400ft we struck into fresh snow, which became 3 or 4 inches deep as we reached the summit a little higher, but stops at Easton.

Transition zone seems to run to the summit on warm slopes with hemlock, *Abies balsamea*, and cedars. On cold slopes over the summit Canadian zone is marked by *Pinus murrayana* + *Populus tremuloides* - down as far as Easton, where *Pinus ponderosa* + cedars begin on at least the warm slopes. (2100ft) Rain + snow + clouds and fog + dirty windows prevented any good observations along the road over the mts.

at Clunium <sup>(1900ft)</sup> *Populus tremuloides* continues along the river bottoms but *Pinus ponderosa* is abundant and a little *Kunzia* is seen. Below this country soon opens out and the timber is restricted to gulches + hillsides

At Ellensburg (1500ft) there are a few scattered *Pinus ponderosa* along the river bottoms, also a few thickets of *Aspens*. Cottonwoods are abundant + seem to be *P. balsamifera*. *Astragalus tridentatus* becomes common + *Kunzia* is seen along rocky places + on bottoms. The hills are big + bare of timber. It is a question whether to call it upper Serran or transition, but I should compromise on transition until better data is to be had.

Continued down the valley between lava ridges to North Yakima at 1150ft.

At North Yakima the alfalfa is still green + leaves are green on apple trees + some of the apples have not been gathered.

The country is marked by mostly mixed species of plants but seems to be upper Serran zone. *Astragalus tridentatus*, *Dioplosia canescens* + *toxicaria* + *Kunzia* are abundant, with some *Tetradymia* and along the bottoms patches of *Opuntia*

## Natches

Nov. 22. Went up to Natches on the new railroad & tramped over the mesa west of there. The edge of *Pinus ponderosa* is about 5 miles west on the mesa at 2500 feet. All below seems to be Upper Sonoran zone.

The mesa 500 feet above the river bottom is apparently as warm and probably freer from frost than the bottom.

Soil is excellent in both and good crops of alfalfa, grain & fruit are raised when water is to be had. A fair crop of grain is raised on the mesas without irrigation.

Good apples, pears, peaches & apricots are said to grow on the mesa at 2600 feet, about a mile below the end of Tunnel No. 4 of the Govt. Ditch.

Thomomys are abundant and very destructive in fields and in one alfalfa field I found a few *Microtalus* burrows & runways.

Traces of Coyotes, Coons, wild cats are common and badger holes were seen in many places.

- Paseo to Le Gravel

Nov. 23 Reached Paseo at 1:20 A.M.  
& waited till 7 A.M. for train to  
Pendleton. Then waited from 11 A.M.  
to 4:40 P.M. for train to Le Gravel,  
only to find no Sunday trains  
run to Elgin & will have to  
wait till Monday morning.  
Would drive out to Wallawa, but  
it has been raining for a week  
& mud is deep.

Nov. 24 Sunday, Rained all day,  
mud deep & some snow on hills  
all around valley.

Nov. 25, Took train to Elgin at 8:30  
& arrived at 10. Left on stage at  
1 P.M. for Wallawa & reached there  
about 8:30 P.M. dark, cold & muddy.  
Stopped at Mr. George O'Brien's  
hotel & had a delicious hot supper.

Wallawa to Chico.

Nov. 26. Got off about 10 A.M. with Mr. Howard O'Brien, Forest supervisor, with good saddle horses & pack mule. Took bed & grub. Rode hard till long after dark & got into Chico, the ranger cabin about 8 o'clock. Got some supper & slept on hay in hayrack. Snow 1 to 6 inches deep in timber. Warm slopes bare at Chico. Came about 35 miles. Cold, tired & sore.

Nov. 27 started at sunrise, taking Walter Fay, the ranger, with us. Ground frozen hard & white with frost & struck snow on top of ridge above cabin. Traveled N.E. till noon & struck the wolf proof fence in about 15 miles. and rode along part of two sides. Then down to the ranger cabin & got lunch.

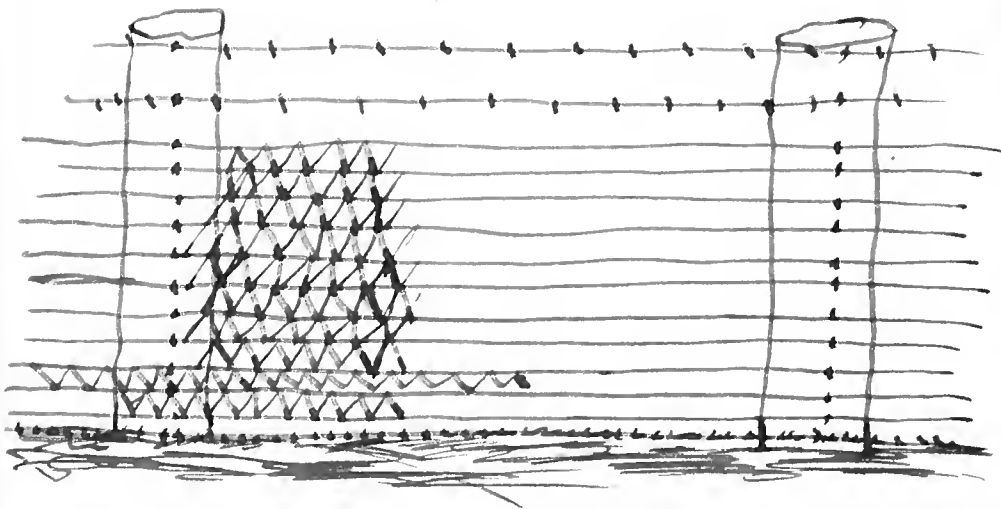
Snow is about a foot deep in the pastures and crustal so it will nearly hold me.



The pasture is located on top of the mesa between Joseph & the Delnada. It is probably above 5000 feet and mostly in Canadian zone. The warm slopes are covered with open woods of *Pinus ponderosa*, but the level & cold slopes are mostly a dense forest of *Pinus murrayana*, *Abies*, *Picea*, *Pseudotsuga*, *Aspens*, *alders* & *willows*. There are some small meadows and some open dry patches but over half of the 4 section pasture is best Canadian zone forest.

Much of the murray pine has been killed by the insects and 3 trees had recently fallen across the fence.

The work of clearing the way for the fence was enormous & expensive. A strip of about 20 feet was cut out & the stumps blasted out. In places the fallen trees lie 6 feet high in a tangle & these had to be chopped through as well as the standing timber. There is bound to be much trouble with falling trees.



The pasture is 2 miles square.  
The posts are 16 feet apart,  
and only about half could be set in  
the ground on account of rocks.

The rest are "jacks" -  
posts with a set of  
braces nailed at the  
bottom & loaded  
with stones.

A heap of stones  
that I think  
would weigh  
500 to 1000 lbs.



These posts are very solid but  
took a lot of work to build.  
The posts are peeled, very heavy,  
and most stand 2 feet above  
the top of fence.

The fence is one 4 point top line  
on the ground, close about this a  
42 inch Elmwood triangular mesh  
with 4 inch triangles in 10 series,  
above this 6 inches a light 2 point  
post wire & a heavier one 8 inches  
above, making a 4 foot 8 inch fence.  
It is well built & well stretched.

Cover-Mountain sheep are said to be holding their own or increasing in the Wallawa Mts. Mr. O'Brien reports a herd of 30 seen a year or two ago + many smaller herds seen.

He also has been told by old hunters that sheep are deaf in winter and one that he killed in March had the ears completely filled with hard wax that could only be dug out with a strong knife. It came directly toward him while he was shooting + seemed not to notice the sound.

Fresh tracks of 2 coyotes were seen in many places in the pasture and these 2 ~~had~~ have been there all the fall. The ranger thinks they were fenced in. Coyotes are abundant outside all over the mesa country. Many fresh tracks were seen and one coyote.

Several bears are said to have gone through the fence this fall, by squeezing over the mesh and under the bars.

Deer are said to jump the wire and Mr. Fay shot a large buck in the pasture a few days ago and wounded it + followed when it jumped over and beyond. Mr. Fay + Mr. O'Brien agree with me that another wire 12 or 15 inches higher would probably keep mountain lions out + keep deer in. I think it worth trying.

No wild cat tracks were seen but the cats are said to be common.

A few badger tracks are seen and a badger skin hung on the cabin. Badgers may dig under + be a source of danger.

Evonston rabbits are numerous in and around the pastures. They go through the mesh but it bothers them. One will track up and down the fence before crawling through & then sometimes turn back.

There are elk not far from the pasture and they might be fed in with hay. The dense timber would be ideal for them in winter if some hay was available.

There are said to be several bands of elk in these mts, about 20 in one herd. Some are killed every year & the Oregon game laws are said to be a farce. There is no law protecting deer.

2500 sheep were kept in the pasture through Sept. & Oct., and Mr. O'Brien thinks 2500 can be kept in it all next summer. The fee for sheep on the reserve is 7¢ a head for the summer. It ought to be doubled in the pastures for the saving of birds & protection of sheep. Still at 15¢ a head 2500 sheep would yield a revenue of ~~only~~ \$375 a year.

This rate would require 20 years to pay for the fence - total cost \$600+.

But under ordinary circumstances the fence would have cost about half as much & if the sheep would pay for it in 10 years that would be as good as the Reclamation Service requires.

The excessive cost of this fence is due to location and rough work. It is about 100 miles from the end of a spur RR. over very difficult freight roads and new roads had to be built a long distance to it. The expenses for freighting was enormous.

Excessive rates were necessarily paid to get the freighting and other work done promptly. Men were paid 3<sup>00</sup> a day for 8 hours work and poor men at that.

We should ask for a copy of the summary of Mr. O'Brien's report on the fence. also for Mr. Jardine's report on results.

In other places the fence  
can be built for less than half.  
More expensive material was used than  
called for in my specifications.  
The Elwood wooden wire is 42 instead  
of 36 inches and cost 66¢ at  
Elgin, I think. See report at forestry.

Other makes of wire are cheaper &  
the next move is to see how cheap  
a good fence can be built.

It is important also to select  
sections where grazing can be  
carried on as long as possible  
and as many sheep kept to the  
area as possible to get the  
best returns for the investment.

Mr. O'Brien tells me that  
a ranchman by the name of  
Emmons about a days trip from  
Willow has a wolf proof fence  
that has been in use 4 or 5 years.  
He is going to get a full account  
of it for me.

## Birds

The Lodgepole pines in this region seem to be doomed. An insect attacks them in swarms and kills acres in a body, then breed in the dead trees and swarm out to attack live trees again.

One pileated woodpecker was seen working on them & several white-headed. Many of the dead trees have a large part of the bark stripped by the woodpeckers.

We ought to have a man working on them. Creepers and other birds may be feeding on them too & we should know the facts.

Many of the yellow pines are also attacked by an insect and are being killed. Mr. O'Brien thinks it is the same as the one in the Black Hills.

Rough grouse tracks were seen in the pasture. Blue grouse & sharp-tailed are said to be numerous in places.

Nov. 28 Started for Olives at 7:30  
A.M. & got back to Wallawa at 5  
P.M., a little after dark. Had a small  
dry biscuit with a piece of bacon in  
it for Thanksgiving dinner, but  
made up for this in a roast goose  
supper at Mr. O'Brien's.  
This is the last of a hard 3 days  
horseback trip. The weather has been  
clear and pleasant tho cold.

Nov. 29 Got up at 2 A.M. & took  
stage for Elgin. Got a good  
breakfast at daylight down at  
the "Station" near forks of river,  
and got in to Elgin at 10:45  
and to La Grande at 12.  
Waited for a 9 P.M. train to Umatilla  
but it was 2 hours late so went to  
bed & slept till morning.

Nov. 30 - Left La Grande at 9:15 &  
got to Pendleton at noon & to Pasco  
at 9 P.M. Waited till 1:30 A.M.  
for train to Spokane.



Dec. 1, Reached Spokane 7 AM + left  
at 11 P.M.

Dec. 2, Daylight in the Flathead River valley  
Got up on top of summit and had breakfast  
at De Smit while waiting for a week to be  
cleared off the track. No snow on summit  
or in Missoula valley, but parties &  
ground frozen & cold. The same  
up Hellgate valley to well toward  
the top of Continental Divide, where a  
light snow laid on ground, about 3 inches  
deep over top of pass. Snow disappeared  
down east slope.

At Helena cold & dry & frozen, as  
along rest of valley. Drove before  
we reached Livingston.

Before reaching Glendive the  
Yellowstone River was all open  
and free from ice.

## Dakota

Dec. 3. Got up at Glendive & then  
kept careful notes as this is new  
ground & important for the game map.  
Left the river at Glendive and for about  
10 miles followed up crevices & draws  
through big badlands. The high buttes  
have a fringe of juniper & yellow pine  
on the crests and along north slopes.  
The creek bottoms are fringed with cottonwood,  
boxelder, ash, bulberry & willows,  
and the side hills & flats are covered  
with sagebrush, (*A. cana*).

Then we came out onto short grass  
plains for a long way with little snow  
grass & small weeds. Then down  
to another small valley and some rough  
country at Surtain Buttes. Here were  
the same river bottom trees & bushes &  
a few junipers along the badland banks &  
lots of *Artemisia cana*.

Then out over more plains and  
down to the valley of the Little Missouri  
with badland buttes & bluffs & bushy  
bottoms & warm, sheltered woods & ~~corn~~  
Here *Atriplex confertifolia* & *Begonia*  
were first seen; they are common on warm  
slopes & in sheltered places with

sagebrush + grivulca. There are lots of  
junipers on the outlet, mostly on north  
slopes, and along streams are Populus spumosa,  
Nygunde, Fraxinus, Willows,  
Bullberry, rose thickets and Clematis  
vines. A large prairie dog town lies  
a mile or two east of Medora & 25 dogs  
were counted sitting up in one corner  
of a field in the worn morning sun, their  
furry coats glistening in the light.

Near Bullfield another & last prairie dog  
town was seen.

After getting out of the Little No. valley  
we cross wide grassy plains again &  
at Bullfield, South Heart and Deekrover  
cross creek valleys with Cottonwoods,  
willows, ash, boxelder, bullberry and  
rose thickets, but with all grass  
country between.

Then it is all prairie with  
now farms & grain fields & rarely  
a bush or tree until we again strike  
Heart River near Mandan. Here  
there is timber & brush as before, but  
only a little Artemisia cana and  
for the first time we strike Quercus  
macrocarpa, Ulmus, Plum &

chokecherry. A red brown grass like  
Andropogon covers the south slopes of the  
hills but there is no trace of Atriplex  
or Sarcobatus.

Reached Mandan at 3:35 & over  
to Bismarck at 4:05. Went to Grand  
Pacific Hotel & tramped over hillman  
works before dark.

It is dry and still but very  
cold. The Missouri river is frozen  
over, the rough cakes of and ice  
have set & frozen together. In  
narrow or rapid places there are  
still strips of open water but most of  
the way the ice is solid clear as  
This is in striking contrast to the open  
Yellowstone river above Glendive and  
below Helena. This morning & last night  
This is further south, but also further  
east.

Mammals

Odocoileus, Fresh deer tracks were seen near the river flats above & below town.

Microtus drummondii, A microtus was seen in the grass near the river but not caught. A great northern shrike was driven away from one it was eating & a mutilated specimen saved. The skull was broken & brains eaten out.

Thomomys talpoides, gopher hills are numerous and large, but some are fresh. The ground is frozen hard & ice is 5 inches thick.

Lepus campestris, patches of pure white fur were seen in several places where jack rabbits had been eaten. Tracks & pellets are com.

Lepus texianus, Cottontail tracks & trails & pellets & cuttings are abundant in the bottom.

Putorius longicaudus, a dead ♀ was found on the flats, chewed up by a dog or coyote probably it had been dead some time. Skinned & white.

Neotoma tracks are com on dog trails on flats. Lots of old excrement is made up entirely of grasshoppers & beetles.

Taxidea, Badger holes are com.

Bismarck N. Dak.

Dec. 4 Tramped over the river flats below town west of the prairie, over big meadows with hundreds of bristled and through thickets of river bottom woods. It is dry and still but so cold I can hardly keep warm with heavy clothes & buckskin gloves.

In P.M. Went up over hills of river bluffs above bridge where I found Yucca angustifolia and Opuntia missouriensis on both slopes and more timber along the bottoms.

Found "red grass" (Andropogon?) abundant on sheltered north slopes and found one patch of Helianthus annuus on a warm basin slope. There seems to be a well trace of Upper Serroran zone on the most favorable slopes, but none over the open country.

Saw fresh deer tracks near the river above & below town.

Mandan.

Dec. 5. Packed up & went baggage,  
then crossed over to Mandan &  
tramped over hills north & west of  
town and over the Heart River bottom.  
Found a stronger element of Upper  
Sovoran than on east side of river.  
The north side of valley is a very  
warm & protected slope and the  
bottoms are warm & sheltered.

As Upper Sovoran elements we  
found abundance of *Yucca angustifolia*  
in well matured ripe fruit all over  
the south slope. Two species of tall  
red brown grass (*Andropogon?*) give  
a strong color to the south slopes  
but not on top or north slopes.  
Other plants that are probably upper Sovoran  
are *Hesperis*, *Sida*

*Aeschylas speciosa?*, *Helianthus annuus*,  
*Clematis virginiana* & *Montzelia*

On the bottoms *Populus fremontii* & *Salix*  
*nigra* may indicate Upper Sovoran  
but I want to map the range of the  
species before deciding.

Most of the vegetation however  
is neutral or transition.

*Artemisia cana* is common along

Tree on the Heart river is 405 inches  
thick

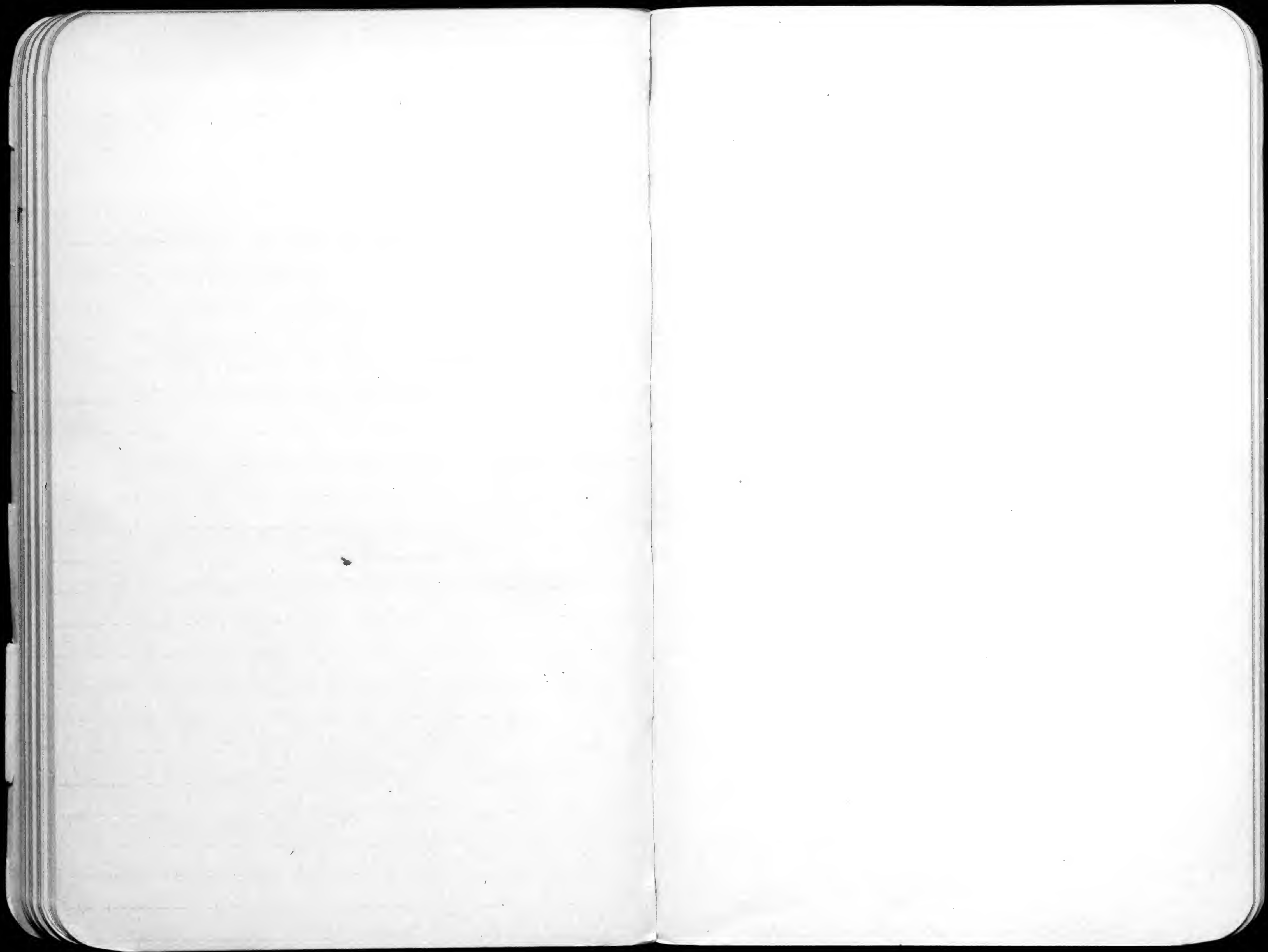
dry slopes on this side of the M.R. while  
only one small patch was seen on  
east side.

*Artemisia frigida* is abundant all  
over the prairie, hills & bottoms &  
is one of the best transition zone species.  
The woods on the bottoms include huge  
old cottonwoods, 3 species of willows,  
Elms, oaks, ash, boxelder, plum, choke  
cherry, bullberry, red osier, rose,  
*Symphoricarpos* & woodhens. Clematis  
vines full of plumey heads cover the  
bushes.

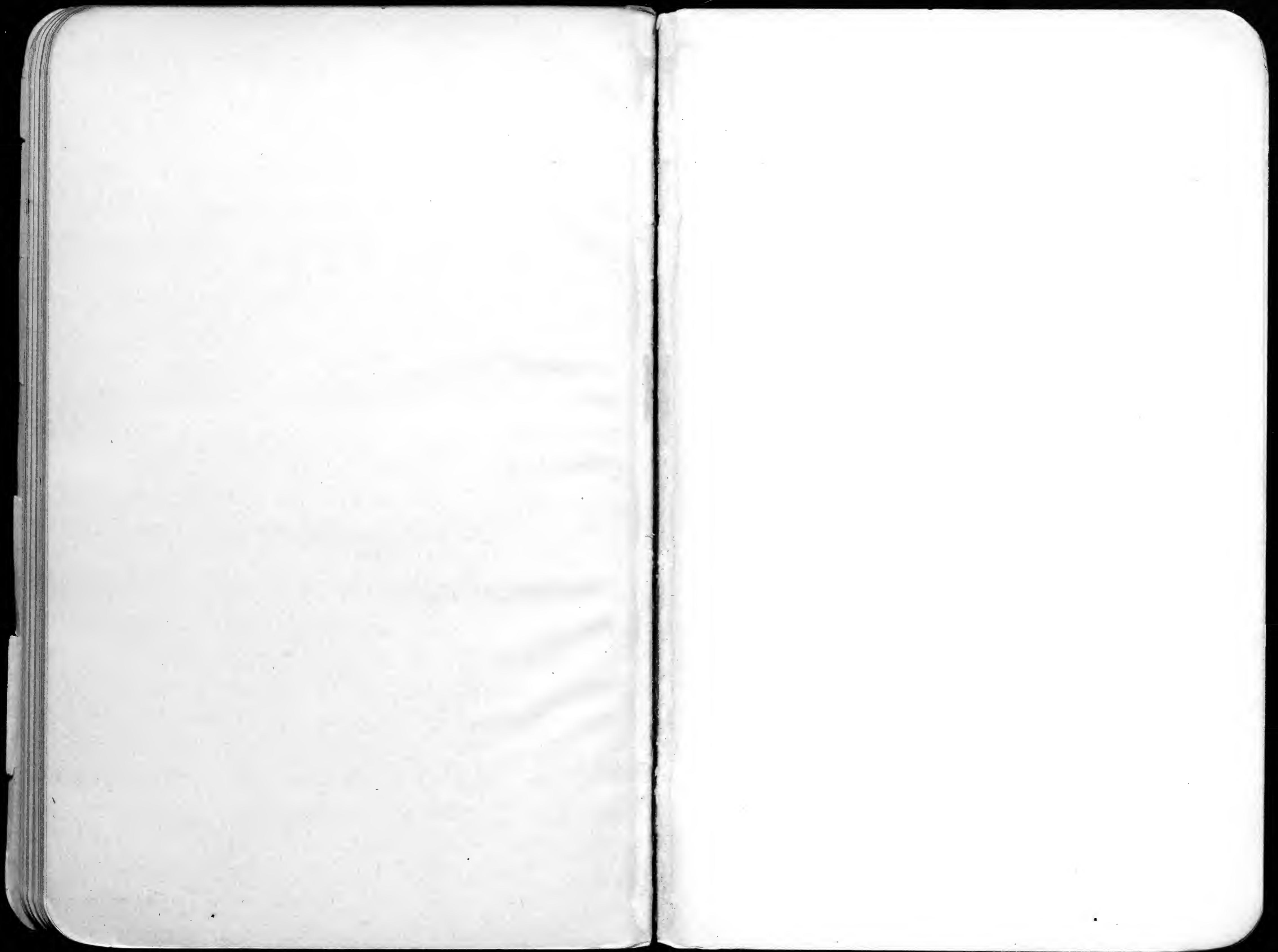
Bluejays (*C. cristata*) and magpies  
were heard in the bottoms, & Chickadees.  
Two downy woodpeckers were seen, but no  
other birds. English sparrows are  
common in town.

At 3:35 took train back to  
Bismarck and on east across  
Dakota prairies till dark.

No trees or bushes after getting 2 miles  
east of Bismarck.







~~was~~ ~~started in~~ ~~1890~~, pretty bad in 1899.

disappeared in 1901. very suddenly  
about March.

620 acres, loss 600 tons

1904 usually gets 2600 tons,

1906 " got 2500 "

\$5000 loss this year.

