Sept. 8. Left Redlands at 3:30 and reached Barrow about 5 P.M.
Sunday and I could not trow more than get located and talk over Mother desist
trip with Mr. Barker, who has cattle over there.

Sept. 9. Hired team and wag with
did, with tried chuckboard. Got camp
supplies and started at 9:30
Reached Whitewater ranch by noon &
then crossed Whitewater River and
over into Mojave Valley and
camped at Chuck Wagon's ranch.
Came 25 miles, one hot desert one
over the hottest days of the year they
say at the ranches. Probably 110-115.
Crossed several good creeks and found
a big stream of beautiful clear water in
the river, up to the horse hills.

Stood acres ago and full set of desert
brush at Canegon & both kinds of mesquite,
full of fruit at White water & Mountain snake.
Saw several all the way except a few
I upper in with states of midges
in crossing over into Mojave Valley.
Some Juniper Queens domino on cold slopes.
Camped late and set only a few traps. Shot 2 jackrabbits & 2 Antelope Doves.

Sept 10th: Slept cold at the camp in damp bottom caudle of valley, but soon got warmer when the sun came up. Left specimens to skin & got off lat 7:30.
Continued east through Morongo Valley across little Morongo Cr., a fine stream of good water, then over divided at 9:30 just as it came into long, smooth valley blushing gently east and bore at 5 miles to "Dawson Well" at 2100 ft and camped. Came about 14 miles.
Morongo Valley is all wild pines, covered with the full set of plants. Cressats, greas, rupshucks, and queen hawthorn begins in the east and bears over to divide into Mojave desert. Cacti are abundant. There is just a trace of wildfowls, on cold slope of divide and along cold sides of ridges north and south of Fortuna Well Valley. The soil is granite gravel, dry & loose.
Wassers Well is about 3 miles down on the Mojave Valley slope at 3,100 feet. The valley is steep and slopes gradually eastward past Coyote Hills and an blown to 29 Palms. Some 23 miles still further east. The ridge to the north, 20 or 300 feet higher than valley separates it from the Mojave Desert proper of about the same level as the Well and of the same general character of country. The ridges further south are higher, 1,000 to 2,000 feet higher than the well and covered on north slopes with juniper and white but no larger timber.

The rock is mainly granite of coarse texture and the washes are granite gravel. The soil of the valley is firm and good generally and supports a good stand of desert plants. Water is scarce, but that at the well is very good. A windmill pumps enough for the cattle and for packing teams. A cabin or cottage at the well and some by the cowboys or campers.
Sept. 11. Tapped and collected about the well and got most of it on

Sept. 12. Took up traps + set back. Tracked Wassia hound at 9.30
Mission Creek at 10 and White Water back at 12:30. Camped
set traps. Very windy but rather warm.
Sept. 27, Left Paradise at 9:30 AM and followed up the Mono Creek to about 2200 ft, then over the ridge and down into Long Canyon at Switzer's, then north over the ridge just west of Strawberry Rock and down to Colbys Ranch.

Switzers 3100, top of ridge 5500 and Colbys 2500.

After entering the canyon at 1400 ft we went in pure Upper Sonoran zone all day. jeeped for a trace of Manzanita on the ridge and north slope of Strawberry Peak. Here are lots of plants coloring with the Ponderosa now red and in the gulches N.E. of strawberry are some Limberwadors and Mr. Colby thinks some yellow pines. It got dark as we came down the north slope so I could not tell that it was pitch dark when we reached Colby Ranch in the Cold Water Canyon at 9500 ft. The last mile of stuff trail down the slope I followed with my feet more than my eyes.
Up Zajunca Canyon

Sept. 28. Spent the morning looking over the Colby Ranch and talking so did not get off till 9:30. Started Zajunca canyon at 3800 ft. followed up to Alder Creek to up Alder to about 4300 ft., then over ridge S. E. to the Chilico and camped at 5300 ft. above the cabin.

 Entered strongly marked Hamilton zone at edge of Pines flats at 5250 where Pines ponderosa and Jeffrey & lodgepoles and Pines lamballea & coast Pines are in continuous pines with Abiesa tridentata slopes. This is a winding basin and you can see the ridges and slopes. Wildflowers and flowers are also common to the cool Pines flats and Cypresses. Also Salmonberry and Skunk Cabbage and many others without names.
Man Days.

Chocorilus acrophilus – One live & one dead seen
in Bigley Canyon & a headstone at
Colby's Ranch. Tracks Colby's in
Bigley Canyon and old Orville canyon
so I supposed Colby. Thu killed at Colby
this year.

Ovis – Colby says he has seen tracks on Shackman's
peak that he believes are sheep. It is
an ideal peak for them.

Seius nigrinus – Cousin or Pine Flat.

Stilling beeches, all trees all along.

Very beautiful wind blown trees all along
at Colby's. One tree dead in slightly
immediate
Entanius merriami, first heard at 300 feet
in Arroyo Seco Canyon, then along
all along.

Theata juniper – Stick bushes all
along Arroyo Seco

Thornycroft, palaecho, &v. at Colby's in
Colorado Canyon at 3500 feet. Scarcely
damage in bigleaf or maple. Many chaps
One pin on wall noticed.

Pseudopus aegypt – Traps Colby in
8000 feet up.

Sept. 25. Slept cold and got up early but
waited to write up notes and did not
get off till 8:45. Started east over several
ridges, each getting higher until we
crossed one at 7000 feet. Drove into
Buckhorn Canyon, ran out at 6500 feet
on the N.E. side of Mt. Waterman.
Camped at noon and went to top of
Waterman in afternoon, got back
in time to cut all the traps.

Have been all the way in pines
Transitions gone. Even to the top of
Waterman at 8000 feet is nearly
a trace of Canadian. No pines meserve
and probably no firs. Pines Lawley
is very much like firs in dry north
but always distinguished.
Pine borealis, Jeffrey's, and larches
and Abies concealed up to the top:
Liberaceus reaches 3500 feet high.
From Chilico to Buckhorn is about 12
miles of fairly good trail and
all the way through beautiful
forest of pines, cedars, firs.
It has never been cut and not
unnatural burned. There is no
chapot or dust underbrush.
Sept. 29, followed main divide or backbar of range east to Mt. Islip, over the top of Islip and down to head Siwega on north side at 6,700 ft. and camped early enough to set out all night. Climbed up and down steep peaks and ridges all day ranging from 4,500 to 8,000 ft. Came about 15 miles, all the way in pure transition zone. The slopes are so steep that most of the timber is levelled. The dense forest has been burned out but the scattered timber remains untouched. The same trees were seen as noted yesterday. No trees of Canadian zone was noted on Islip, but on the peaks east of it there should be some on col slopes as they reach 7,200 ft. Bird and animal life is rather scarce. Only 2 species were passed today.

Caught inchworm pupa, 5 antermoder (spider) 5 silver-spotted skipper and that listmine caterpillar. Could was transected near a bush with pitchy aspect.
Sept. 30. Followed trail down to Squirrel Inn, and road down the canyon to Aguna, where I left Chas. Richardson to bring the horses over in morning, while I took evening train to Pasadena.
Las Angles to Fernando

Oct. 28, took 2:30 train for Fernando + spent the rest of PM. Hanging over wash east of town.

Oct. 29. Drove west from Fernando about 3 miles, then north across valley to Santa Monica. Up a canyon nearly to summit of ridge. Got back at dark. Wrote up report in evening.
Oct. 30 - took 7:37 train to Saugus and got train & drove several miles up San Francisquito & Solitude Canyons and got good lots of plants & birds.

Extensive orange and olive groves were seen along the R.R. from Fowards to the tunnel. Then upper Soeean disappeared covered the hills where not passed over.

As we came out at Newhall the valley opened out and is watered by scattered live oak & A. lobata along the ridges, and Walnut and tamarisk along the dry wash. At Saugus the valley is wider & the bottom open & woody.

San Francisquito valley is a shallow upper Soeean wash, full of juniper, Artemisia tridentata, and mainly upper Soeean brush.

Solitude Canyon is much the same but a little more open and the nearly bottom part very cactus, mixture of low Soeean and distance up.

The ridges are pure upper Soeean, covered with Adonis,バレックス.
dunarea, Rhus ovata, Prunus ilicifolia, and nearly the whole set of ephemerals. The wide valley about Serengue and to the west is partly cultivated, but in waste places grows most of the same scarce weeds of the San Fernando Valley, such as Eremacarpus nitidus, Cactas californica, Frickelstein lanceolate, Marachinus vulgaris, Opuntia (and pulchra), Orostalais var., and in woods Descecas pinnata, Lycopersicum esculentum etc. Ancheless chloris grows abundantly on low valleys and foothills, but does not come into the valley unless on ephemeral covered ridges. Cactas usually have fleshy lined nests in many of the cactas bushes a mile north of Serengue.
Left Seaview at 4 P.M. & followed down the Santa Clara Valley to the west. The valley soon widens & there an extensive alderwood & willow bottoms & great patches of Bocconia minima and Phleum bracts down as far as Mission Canales. Here the valley begins to be cultivated & has fine large groves of Orange trees full of fruit, also olives, pomegranates, English walnuts, peaches & carobs.

At Pico is a large lemon grove of fine trees full of fruit. The river bottom are sandy & won't mainly used for meadow or pasture land. The fruit zone is along the side plates & foothills below Chilnualna.

The valley is about the same to Fillmore, good orange, lemon & grapefruit groves & the wild fruits that go between - apples, pears, grapes, olives, etc. Also corn, alfalfa, squashes, melons & vegetables.
At Espe, the hills rise higher; it steps to the north and are breasts with long armed spread. Rose bushes, mountainous. Prairie and live oak. Euphrates littoralis come down on the washers. The soil is black rich and there are large fields of grain & beans & less fruit.

A few miles west of Espe the citrus fruits have ceased but peaches, apricots, English walnuts and apricots. Olives & grapes are still raised but the varied vegetation becomes more dense & the slopes calmer lower down as we near Santa Paula.

Just west of Santa Paula

Here are great 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 bag & rode up past the old Mission, to the stone chukker quarry & tunnel then up the trail to summit of Santa Ynez Mt. & along ridge to highest point, 3,987 ft.

I took no accurate contour map but by dividing the slope into halves or quarters could estimate approximately altitudes.

The lower 500 ft of the slope is largely open country with scattering live oak & tongues of chaparral in the gulches. Parts of it are cultivated and groves of orange, lemons, grapefruit, olives grow up to its upper edge. Also a great variety of native trees & shrubs.

Above this the Upper Sonoran chaparral begins and scree to the top of the range is a dense mass, impenetrable except along trails. A large element of northern species occurs here, so species that do not go much farther north.
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 bursar's collection identified and labeled and the names worked into our reports and note books.

Miss Alice Eastwood came over and helped us one half day and then went to the Berkeley herbarium and worked with Prof. Hall another afternoon. We dined at the Faculty Club with Mr. Gilbert and met Prof. Eichelt, Prof. and Fred. Hall. Also Prof. Kittler and Dr. J. C. Merriam of the California Museum and a lot of other interesting people. Dr. Ward, of the bacteriological laboratory, told me of 5 cases of fabric plague near Berkeley to San Francisco in which the men had been out shooting and had carried home ground squirrels (Citellus) in their pockets. It is suspected that the squirrels were infected by the plague and their fleas conveyed the disease to the hunters. The Marin hospital physicians studying th
Problem in relation to both spermophils and rats. Mr. Need tells us that the plague bacillus can be positively determined without much difficulty, that a slight nodule as a smear of blood from the thoracic 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 pebbles from the asphalt beds near San Diego 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 woolly mammals.

Berkeley University is a delightful place and the faculty club makes the old life takes a glowing after
To Lovelock, Nev.

Nov. 6 Left San Francisco at 4:20 P.M., for Lovelock. Met with a "Plague of Voles" as reported.

Note: Daylight at Truckee, then yellow fields and transition goes to River. Upper State ran began good and better, below the meadows at Sparks, but the big meadows filling the bottom of the valley from here to Sparks and Omelas beyond is probably transition, likely because a warm, cool winds. The train missed Washougal and went down the south side of the valley & then over the mesa & Ogden and around by the Carson Sands, over dryest mesa subject to the ditches but not yet reclaimed. Many streams had a few brush as up but the ground is still bare boulders. The whole valley looks even more brown and bare than I remembered seeing it before. The lake and salt marsh are about as I remember them. Reached Lovelock about noon.
In afternoon drove out to Ute Reservation, as it is called—Roger Ranch, and found Mr. George S. Webb, the manager. Together went out over fields that had been alfalfa last year and now a porous mass of little white burrows and mounds, so close together that one's mount is enticed by 20 or 3 burrows and the earth fills—our burrow fills two or three times as would if not thrown back. Ores put cast into the honeycomb and almost every bunch of alfalfa remaining for a burrow or two against its roots and is being rapidly consumed by grass. Large fields have been almost doubled of alfalfa and many are being plowed up. Mr. Webb says the crop on the Roger Ranch is 1,500 tons short on account of the mice. This year except the after effect will be more serious next year. Alfalfa is now worth 12 to 15 dollars a ton at Fortlock. Last year the crop on the Roger Ranch was about 10,000 tons. This is all fed to stock.
dying 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. In the way to the ranch I picked up a dead jackrabbit in the road that made a fairly good specimen. Saw also a dead coyote on my return saw a live one out in the field hunting mice. Excellent hills are very large and very numerous in places. The Missionaries seem to be montane, but many small gray individuals may prove to be Mexicans.

Saw many Orthochaetes callosum & wastissoni in the cottonwoods along the fences and flying over the fields or sitting on the ground. Saw a few Archizipta lagopus sanctijohannes and several leveitis cootl away the trees or flying over the fields. Saw a few jacks migrating skimming over the fields close to the ground like a weather bird.
Saw several marsh hawks in this usual pursuit. Saw a large flock of gulls in the one of the large fields of the ground and wary/worply circling low over the fields. Ravens are common and wary well seen on the ground, out in the fields chasing or eating mice. Magpies were common along fences and cottonwoods/ willows and out in the fields, sometimes following a fowl or lighting down and hunting on their own account. Small birds are rare, a few sparrows and larks were heard. One alake, that looked large and dark enough for a bird, was seen near the fence.

On returning to town I laid in a stock of poison, cyanide, phosphorus, and wire for badam cattle. I have plenty of strychnine.
Nov. 8. Mr. Wolff took me out to the Ranch to stay while doing my work in Willy's, and on the way Mr. Wolff told me 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, two or three to run.

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

He even told me they were putting about 16 bushels of wheat on this field of 40 acres. They were pouring it broadcast in strips up to done the field, not thick on the ground as if seeded.

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 cracked wheat and distributed while wet. It seems
safest not simply to handle by this
way and work being distributed by
3 dull looking Scandinavian workmen.
Two of these bushels of the wet and
poisoned grain were placed in a
big box in a low shed and along
above the horse slowly while the
2 men scattering the grain. Each
had a large tin pail. These were
filled with a shovel and carried
on the lift arm while with a
big spoon the grain was peating
as the men walked. It was
not intelligently done and as
much was scattered on salt grass
ground where mice so Myxus is in
the worst infected spots.
It would take 200 times as long
to put the grain down the trenches
but this would prevent much of
the danger of poisoning stock or
birds. I told that the mongooses
die by eating poisoned mice but
suspect they eat the grain as well.
We then went over a field where the pastures were all 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. We then put out the mice in the field, hoping to inoculate the mice as 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 arly plow and 8 horses. The bookkeeper, Paul Reed went with me in a coach with gloves on and a cool 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 the mice jumped out and scrambling we went out of breath and panting & tired but had as many mice as our cans would hold without losing
December 1st. Later one bit my thumb through a heavy leather glove till the blood ran in a stream.

P.S. Another square and had 141 burrows in it and thousands of ants, but none in it just as numerous.

Smothered by their own numbers. On counting 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 in 1 hour, or in 10 hours 2000. With a long handled dipper one could catch them faster and easier. They could not bite us through heavy leather gloves, but would stand up and fight valiantly then bite as deep as they could into the leather.

The 85 7/11 were put into 5 cages and given preparations of arsenic on sugar bush, wheat or cracked barley and expanded potatoes on sugar bush or barley.

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

A large lot of pellets made up of miniscus fly 5 tons were gathering when the gulls sat during this
nesting time and another batch
under trees along the edge of the
field where hawks roosted out.

The birds seen today were:
Archilochus carmelinus at least 4 were
seen in the trees along the fields or
out in most upland fields.

Rufous-throated - Red-tailed hawks
unsually congregate 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 this corps were so
spotted out as to land conspicuously
in the hawks flew.

Circus macroura - 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.

Cerreus bonaniosus - A few marsh hawks
were seen skimming low over the fields.

Bubo - A great horned owl came
into the cottonwoods close to the school house
in the evening, but paid no attention to
the chickens, ducks & turkey snuggling in trees.
Larus delawarensis. Gulls were busy flying over the fields all day when not settling 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 cawing over the field. This was in about a 40 acre field where the mice had ruined the wheat crop. The gulls are often seen diving to retrieve a roadkilled mouse and many a gull takes place over the pong. 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 or owls by their greenish-reddish form. Occasionally a gull rides part of the bones out of a pellet after it comes up + we hear it often.

Gulls often are seen chasing mice on the ground and evidently catching them by their wings and legs. A sudden flurry of some part of the flock of sleepy gulls, a rush + flutter of wings followed.
Hysterical, Black crowned Night herons came into the field after 7 PM until 4 AM or as long as I stayed. I counted 12 in one field, flying in a sitting like soldiers with action poised watching at Microtus trancaus. I watched them creep up with bill poised ready to strike but did not actually see one spear a mouse.

Thrushes — A small week bird calling in the greasebush beds of the ranch buildings.

Corvus simillius — Ravens are common and almost constantly heard or seen over the fields. They are often seen on the ground watching at burrows or pecking 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 shot from the sky.

Corvus caniceps — Crows are much more numerous than the ravens and seem even more active in pursuit of capture of mice. Fifty to a hundred crows are often seen in an 80 acre
field, scattered out singly or in small squads, chasing or eating mice. They are often seen carrying mice in their bills while flying but I have often seen them tearing the mice to pieces on the ground. I have seen 2 or 3 cons faster flying pests, each tearing up a chick and eating it bit by bit.

Pigeon industries - Magpies are numerous and constantly seen in the fields or on the fencer or in trees or flush along the edges. They hunt persistently over the fields, one in a place, but apparently with great success. They have often seen carrying mice 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. Pigeons seems to be their principal food.

Emperor pigeons (Helopana roseopectus) and Brewers Blackbirds are common in the fields, especially on plowed ground. I have not seen them hunting or carrying mice, but I have seen they find grubs or insects plowed up.
There seem to be no grasshoppers or
other insects out. There have been heavy
storms and most of the wildflowers
and shrubs are gone.

Observations: Harvest lacks
are common in fields and along
roads.

In evening I went over to the
nearest neighbor, Mr. Aulker,
who has lived here 30 years and has
a ranch of 620 acres, mostly in
alfalfas. He estimates his loss this
year by the mine at 600 tons, or over
$20,000.

Last year he cut 2500 tons of hay
and this year only 1200, but he
attributes part of this shortage to the
late, cold spring. He is plowing
up some of his best fields where
the alfalfa has killing out by the mine
and will plant in grain next year.
He thinks the loss will be much
greater next year from this damage
and very done.
Oct. 7. In the three arsenic lots on
wheat, barley and sugar beats the nine
were all dead in this cage this roving
but one. In the two trials of arsenic on
wheat and sugar beats none of the nine
were dead except a few that had probably
been hurt or were eaten up by the others.
So I mixed a little of wheat + a peck of
mixed barley with half a pint each
dry arsenic and cut up a quantity
of sugar but cubes 44 rolled in
arsenic + put out in the field.
The wheat + barley each cased about
an inch, distributed in busses +
runways + it took two or two
half an hour to put out each kind.
The result remains to be seen,
and two nights should be allowed for
definite results.
My program came + I set a few traps
for geophiles & tide some photographs
which carried out the dead mice +
beef then placed under + caught
each list of bitines. With a
thin line in one brand + glow an
I followed the plan for 36 minutes
of caught about 127 bitines.
Flame birds as yesterday were seen and a few others.

Lesser black-backed gulls were counted at one time in two flocks on the ground and others were flying around over the field. The gulls had been here for a week or more, Mr. Wett says.

Achelous canadensis — in a field two miles from the ranch house I counted 10. Roughly hawks fly out of one direction but do not direct along and probably 20 were seen sitting on the ground out over the fields. All seemed full and satisfied.

Many of the hawks were in beautiful plumage with black tailing, white head, cape, and basal line of tail but vs conspicuous was seen an army. Many were close by and the glass showed them up distinctly.

Falco mysticus — one seen sitting on a gate in big field. He was very tame and studied 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 and eventually hunting mice. I did not wait long enough to see if it caught 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 killed by the poacher.

Homozygus woodii - The cottonwood groves are numerous and the cottonwood is growing well with the groves in irrigating fields that are doing great damage now.

Falco sparverius - A few adult males was perched on a fence but I did not get a shot and I did not ask him what he had been eating.

Arens c. hudsonicus - A few wasch larks were seen over the fields.

Euopus cyanopterus - A large flock of several hundred was sitting in the cottonwood tops near the ranch just after sundown.

Sporophora nana - One seen on fence.

Culeptes ater - Two were seen in the pretent.

Junco - Juncoes are common in the orchard and bordering prairie patch.

Melisula parvula - A typical winter pole rabbit was seen entering the yard near the house.
In the evening I went over to the ranch of our nearest neighbor, Mr. P. Austin, who has lived here for 30 years, and has a ranch of 620 acres, mostly in alfalfa. He estimates his loss this year by the blight at 400 tons of alfalfa, or about $5,000. Last year he lost 2,500 tons of hay and this year only 1,200 tons, but he attributes part of the shortage to the cold, late spring. He thinks the loss next year will be 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 rains have-shift will need to ship it later.

His potato patch was nearly ruined by the chives and which should have had 6 tons of good potatoes he gathered about a ton of blighted potatoes.

Knowing Mr. Austin to be an old resident and a very reliable man, I went over expressly to ask him if such an invasion of chives had
even occurred before. He said it had only once in his 20 years been
a similar and equally destructive wave of mice taken in 1899, reach
this greatest abundance in July 1901, 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. Ander asks tells me that the guilke "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.
Nov. 16. Caught a few goats in the field. In P.M. went down to field and put out the poison yesterday and found 4 dead mice along the stripe where Phosporous treated what had been put out. Also found a little pile of what (about a teaspoonful) smoldering on the top of it with a stick it burst into a blaze.

One sick mouse that died in about 5 minutes was found where assuming poisoned what had been put out but none were found where the boysy or sugar beets were distributed. The grain and beets had been partly eaten but I think the mice die in the barns instead of coming outside as they do from phosphorus poison tomorrow we will dig open some of the barns to see.

Saw other fields where the mice were as abundant as usual and in one field of beets where they are usually they are wonderful. They seem to nibble on the hay stubble what grass has so call it.
Saw no new birds but an
inesential number of rough-billed
fowls, 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
more new territory.

The reenactment in the cages to
which I had fed some of the poisoned
wheat & barley had all died, while
those fed phosphorous poisoned wheat
well about half alive. It is probable
that too much phosphorus was
used and the taste odor was
offensive & hence it was inedible.

I had about 100 dead mice to
carry away but saved the heads
of a lot of the rats & examined
probably 60 females to see if they
were still breeding. Not one showed
signs of pregnancy, and I have
not seen any young less than
one third grown. I probably a month
old. The breeding season seems
to be entirely over. I would not
be surprised if the birds prasing in
They would practically exterminate them before the breeding season begins again, probably April. If half the mice were poisoned the kids would surely do the rest. Coyotes are also numerous and must consume great numbers of the mice.
Rogers Ranch

Nov. 11, Made up 20 pounds of Marion's mixings till noon when Mr. Webb returned with the Barium carbonate, then mixed poisons and fed the mix in cages and later took wheat prepared with it to the field and distributed about 6 quarts on about an acre, putting a teaspoon full of wheat down each fresh oal well used barrels. I mixed half a pound of the Barium with 2 quarts of wheat which makes 10 times as expensive as arsenic. Some of the above preparation was fed to 12 mice in a cage and 1 in other cages were placed in stronger mixtures and also Barium on sugar beets. This was put in the cage about 1 P.M. but only ate 2 mice (with the wheat) were found dead before dark.

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

In the area where arsenic poison sugar beet cubes were distributed day before yesterday one dead mouse was found on the surface, but none were
July 13. The sugar beets were not touched this
year. They have been cut 2 weights. The coating of
arsenic was very thin, on the 1st day.

41 lb. by digging out several burrows.

When the arsenic poisoned what
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 Mice.

Their stomachs were full, mainly of
green alfalfa, but in each was
the ground up remains of 3 to 6 pieces of
about 1 cm. Possibly only one. Evidently the mice poisoned
with arsenic go into the burrows to
die. A few live mice were seen
rubbing about on the area where
the poisoned what 5 beets had been
put out but not half so many as
on the next block after most had
been disturbed. The air is not as
vasty freshly used burrows with
on the poisoned area.

A new line of poisoned beets
sustained long enough. The line of
burrows near the edge of
potatoes. These pieces were
large to be eaten at once and the
amount proved out of them can be seen
each day.
P.S. repeating.
Bacillus: All 3 mice were dead in morning. Perhaps Bacillus killed them if works very slowly.

P.S. next morning.
Apple: Considerably eaten. 3 mice dead, 1 alive.
Potato: Not much eaten but 5 mice all dead.
Cabbage: All 4 mice dead. Not much eaten.

Nov. 12. Only about half of the vegetables had Bacillus Bacillus and dead in the morning and these mostly eaten or may have been killed by others.
Later in the day all poorly killed mouses were evacuated & filled with bacillus & put in a can with 3 live ones.
It was promptly eaten, and a large part of the storage taken out at 5 P.M. 6 live mice showed no symptoms & died in 2 days. Bacillus seems not fatal.

At the same time another was well filled with arsenic & put in with 3 live Mus coptus and in 2 hours 2 of the three were dead, 1 the other was dead in morning. Others were put in same can fed apple, potato, cabbage, onion, & bell pepper with dry arsenic sprinkling 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. Considerably of the potato was eaten & then one of the mice died before dark.

The cabbages were not eaten for some time, but by 5 o'clock 2 of the mice had died & others were affected.
P.S. Next morning.

Onions: In the morning both had been eaten and of 3
  inves 2 were dead & 1 alive.

Beetle: Edge eaten - all 5 mice dead.

Cabbage: In the morning cabbage not touched
  by mice.

Red Mice: The 4 poisoned mice were not touched.

Apple: Some eaten from nearly every piece.

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

Onion: Not touched by the mice.

The onions were not eaten at 3 a.m.
  but at 5.30 a.m. some had been eaten
  and 2 of the mice were nearly dead.

The beetles was not eaten until
  late, but at 5.30 a.m. the edges had been
  eaten all around. The 5 mice were all
  alive. Morning will show the result.

A pan full of fresh cabbage was sliced
  and placed with arsenic and put out in the field.

Four mice took it evasive &
  spread to the shin & filled with
  arsenic & put down hares in
  the field & marked with stakes.

A sliced apple was rolled in arsenic &
  put in the edge 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 the afternoon Mr. Webb drove
  down to the end of Grumgold lake.
  With us to see if the mice were
  numerous down there and in
  the tidal wild land.
  It is about six miles to the lake.
When we were numeorous in the alfalfa fields down about 4 miles, there a family of salt grass and green brush intermixed when they were few or none. Then a big alfalfa field had no mine except a few black-tailed along the ditch banks. Over the flat salt ground there was no trace of mine, but on the winds out near the mud flats there were a few fresh burrows or trails about the homed number for such localities. There are no trails at this end of the lake until far out in the water. Last spring, the water was unusually high and came up among the rushes but had gone back to near its normal level.

The mines evidently have evidently entered the alfalfa fields for surrounding country at multiplying under the frozen food and water. It evidently is not a migration, as desert country around the valley. They are said to be numerous also up at Winnemucca or Battle Mountain.

Large flat swarms are seen over much of this flat valley.
Rogers Ranch.

Notes. The mice had not touched the onions or cabbage put out yesterday but had eaten some potatoes dipped in arsenic. One dead mouse was found close beside the potatoes he had been eating.

The line of sugar beets looked in arsenic & put out 12 days ago were not touched. They were heavily coated with dry arsenic.

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

On the area where wheat poisoned with arsenic was put out on the ninth, one dead mouse was found on the furrows freshly used by screech. Much of the wheat has been eaten.

On the area where arsenic poisoned clover had been put out the 9th, 7 dead mice were picked up & most of the grain had disappeared. The fresh furrows were scarcer, compared with those before the poison was put out.

Went to town but the 8:20 train was 7 hours late so stayed over for morning train.
Nov. 14, The 5:40 A.M. train did not come until about 11 A.M., so I went on report and examined a big field close to town that is full of wildfowl. Also talked with one of the farmers who owned the field and he told me that the wildfowl went as far to where the valley narrows up 50 miles north west as southeaster.

He also said they were reported as numerous at Congroor and in the valley north of Welham. He said a few of his cattle trees had been girdled and killed and he was afraid more would be killed during the winter.

Reached Hagen about noon and Fallan about 2 P.M. and went to the Hotel Fallan. Telephone Mr. McInerny but was not able to see him.
Nov. 15. Mr. Means (Engineer in charge of the Funds Carson Project) took us out over the valley and showed us many places where the gophers had cut the ditch banks. In other places where the gopher holes had caused the water to cut through the banks and do a great deal of damage. We struck one such valley where a gopher had made a large gopher hole through the banks and across the road. This was photographec and also several other places where gopher holes on the ditch banks. Many burrows of badger, dipolomys and Armadillo children were found in these banks but there 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 rollers to repair the bank. If the country was under cultivation such a break would mean immense loss.
The development of this immense valley of good agricultural land is likely to bring up a lot of problems with respect to the destruction or preservation of various species. A little bulletin on the species, their habits, etc., for these valuable would be timely now. Mr. Means thinks it would be appreciated.
Nov. 14: Reached Almaden 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 grapefruit trees in many of the fields in town, full of nearly full green and in some cases brick-red fruit. None of the trees were very large but all were well loaded with fine fruit. Peaches, apricots, almonds and many kinds of grapes are also raised in town at nearby ranches. Most of the valley is big grain fields. Wide spreading orchards and groves evidently are scattered over the valley in places.
To Grants Pass, Oregon.

Nov. 17. Daylight began to break
off Edgewood but we did not get
a clear view of Shasta until
near Ape. This is not much
snow on it for so late in the season.
The peaks were mostly in
clouds but the valley was clear. At
Ashland we got the usual few
Ponderosa oaks. The valleys from
Ashland to Medford and Medford
is a good farm and fruit valley
with a mixture of Nubes, Sycamore
and vineyard oaks. There is
an abundance of Acer Spinosus
('Canthus incanustus').

Thrace?$, 'Acanthus Kilgore?',
but trees are mixed with Pines, ponderosa
+ deodar, pine, larch, yew tree
larches and other transition zone
species.

The solders mixture of Upper Caesar + Transition zone officially continued beyond Klamath but your place on the Tunnel 9 ridge to mostly Douglas
space and on the north end of the ridge some Alets Conifers. A thick
laminar mantle of Casashus casimilis in my first case.

Wolf Creek

A few patches of Casashus casimilis and
Acteckylasts. green but drier and a few Pines poedrast + Sequoias +
Ameramyx Kehleni. but most of the

Tunnel 24-8

After passing through Tunnel 24-8 the timber is mostly Cardings of
this conifer until we come out into the wide open valley, when a few Pines
poedrast + sugar Pines of different

We soon reach Glendale in a narrow valley with several
and a few small closed forests. Most of the country is mostly
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 rift line, half a mile at best on N.E. grades in a beautiful forest of Pseudotsuga and Abies lasiocarpa, with scattered Fagus, Castanea chrysophylla, Thuja, Pseudotsuga menziesii, Abies, and a few deer grass and Vaccinium microphyllum. A few, H. ovalis, Gaultheria shallon, Pteris, mosses, Liriope, Hymenoxys, Aquilegia, Rubus, pavonius + leucosterma, and lots of flies were at hand.

The transition zone in S. valley are Picea's filigree, P. douglasii (one trunk), P. menziesii (a few), P. lambertiana (a few), Lithocarpus fasciculatus (a few), Arbutus, Picea macrophyllum, Acer (little leaf), Populus trichocarpa, and Quins mutabile. All trees in upper Sewer run into same.
Here is a mixture of Canadian and Hudsonian but with a mild winter climate that modifies both zones. Roses and honeysuckles are in bloom in the dooryards as well as asters. Chrysanthenums, geraniums, and many other plants are growing, just as green. The winters are said to be very mild with practically no snow to remain on the ground in the valleys. The summers are said to be delightful.

A little fruit raising is done in the valley but tillable land is scarce. A deer trail was made near the town. There are said to be lots of deer, some bear, and mountain lions.

A tree thinnings hill was seen on the plate over Glandhill, but some on the ridges of in the heavy timber. Distances travel and miles speak rates as common.

Bluebirds, jays, and English sparrows were eating food and flying fast over the pool. The mountain beard was seen a Cooper pike ridden by School Kids.
Glendale to Portland.

Nov. 19. Leaving Glendale at 12:30 we wound along the narrow canyon of the Creek with dense forest up the steep slopes on both sides. Authorities of Canadian 

immigration, zone spires run through the canyon on the mountain on a solid 20 ft. of others on a lot apple. until we near the Sliding Valley they cut thru out at Glendower on a 

Biddle's into a wide farm valley full of good fields and orchards. 

Vesuvius, Min. Zephyr, Washington, 

Pocaterra, minor Pikes, 

and 

unearthly. Their创办 are mostly fruit bearing in the corn and are mostly fruit bearing in the corn. 

The fields show vasty ground of orchards. Apple, peach, plum & pear orchards are extensive and that they are the principal trouble 

of the apple trees are still loaded with fruit. 

After crossing the Wapakoneta River, Whitley Creek, a few patches of Cottonwood 

trees seen in
steps, bare, hot slopes but on other
slopes of Upper Sherman grove
plants: Alloa, riverbanks grow
Poplar, interior, willow, Salix
and others.

Hanging hills are common in the
Nugget Valley but geophy could not
lift in the timber mountains above
Cow Ridge Canyon.

Crows or blockbirds are common.
To Oakland and Drain the
country is similar but high timber
covered hills begin at Drain, too
dark to see what the timber is.

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

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

Nov. 20. Got a lot of accumulated
mail and wrote letter &c.

Left at 11:45 P.M. on N.P.
November 21. Got into Taconic at about 5:45 and left at 8:15. Warm morning. Grass fresh & green but many of the plants dead & dried up. Lots of ripe fields and apple orchards sees hop fields.

Followed up slopes through heavy timber but rain & snow & chilly wintry had this occur for any detailed notes.

2nd stop at 2:400 ft & had it over the summit about 4 inches deep and come down to Esopus on the east slopes at 2150. Then we were arowd and a few miles past Esopus pine forests begin and oaks more abundant. At Clenlma, it is the dominant tree to aspens & alders grow along the bottoms. The high woodlands are all hidden by aspens, the at Clenlma we leave the rain and snow.

About half way from Clenlma to Troop the country opens out with big yellow sun fields on the north. Black timber on the north but with pines and cottonwoods along the river bottoms. There straggles in a touch of upright boughs a both
slopes, but in general the country is transition to flocks & beyond. At last (11000 ft) the snow began to show on slopes above and at about 2400 ft we struck into pure snow, which became 30-4 inches deep as we reached the summit & little higher, but stops at Easton. Transition zone seems to run to the summit on warm slopes with hemlocks, Ailsa crones & cedars. In cold slopes over the summit Canadian juniper is marked by Pinus murrayi & Populus tremuloides down as far as Easton, where Pinus pseudostrobus & cedars begin on at least the warm slopes. (2100 ft) Rain + snow + clouds & fog & dirty windows prevented any good observations along the road & only thigh nits.

At Cheakamus Populus tremuloides continues along the river bottoms but Pinus ponderosa is abundant and little Junia is seen. Below the country soon opens out and the timber is restricted to quelchus & hucklebush.

At Chilnualna (5000 ft) there are a few scattered Pines ponderosa along the river bottoms, also a few thickets of Arceous. Cotoneasters are abundant & bees & L. lutescens. Artemisia frigida,ens Common & Kuingia is seen along rocky places + on ledges. The hills are big & have timber. It is a question whether to call it upper Espean or transition, but I could continue as transition until better data is to be had.

Continued down the valley between lava grades to North Yakima at 1100 ft.

At North Yakima the alfafa is still green & leaves are open a month later than the alfafa up the Wapes Espean grade. Artemisia frigida, Ephedra canescens & totochus & Kuingia are abundant, with some l_FASTYFCA and along the bottom patches of Ephedra.
Nov. 22. Went up to Natches on the new railroad & tramped over the mesa west of there. The edge of Pim's prairie is about 5 miles west on the mesa of 2500 ft. All below seems to be Upper Desert zone. The mesa 500 ft above the river bottom is apparently as warm and probably drier than lower than the bottom. Soil is excellent in both cases. Good crops of alfalfa, grain & fruit are raised when water is to be had. A fair crop of grain is grown on the mesa without irrigation.

Good apples, peaches, pears & apricots are being raised on the mesa of 2500 ft, about a mile below this end of Trench 39-4 of the Golf Ditch. Chrysomelae are abundant and very destructive in fields and alfalfa field I found a few weeks back & running.

Tractors of Copple, Song & Wilson are common and fodor worcesters will be seen in many places.
Nov. 30  Reached Pooseo at 1:20 A.M.  
waited till 7 A.M. for train to  
Pondicherry. Then waited from 11 A.M.  
to 4:40 P.M. for train to 1st Gravel,  
only to find no Sunday trains  
run to Elgin & will have to  
wait till Monday morning.  
Would drive out of to Wallava, 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 steep  
1 P.M. for Wallava & reached there  
about 8:30 P.M. dark, cold. Sunday.  
Stayed at Mr. George O'Brien's  
hotel  & had a delicious hot supper.
Walla Walla to Chico.

Nov. 26. Got off about 10 A.M., with Mr. Howald O'Brien, foreman, with good saddle horses + pack mule. Rode bad + grub rode hard till long after dark. Got into Chico, the ranger cabin about 8 o'clock. Got some supper + slept on hay in haymow. Glow 1 to 6 inches deep in timber. Woke up from bed at 8 o'clock. Came about 15 miles. Cold, tired + sore.

Nov. 27. Started at sunrise, taking Walter Fox, the ranger, with us. Ground frozen hard + white with frost + stuck snow on top of ridge about cabin. Travelled NE till noon + stuck the well proof fence in about 15 miles. Stopped along part of two sides. Then down to the ranger cabin + got lunch. Snow is about a foot deep in the pasture + curious so it will mostly hold up.
My father is located on top of Hill 79. He is a veteran of the Canadian forces. He was involved in a battle in which the Canadian forces were engaged with the enemy. Despite the losses, the Canadians were victorious. He returned home after the war and started a new life. His stories are filled with tales of bravery and loss. He is a true hero.
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 ledges. The rest are "jacks"—posts with a set of hinges nailed at the bottom & loaded with stones. A heap of stones that I think would weigh 500 to 1000 lb. These posts are very solid, but took a lot of work to build. The posts are peeled, very heavy, and rest 3½ feet above the top of fence. The fence is one 4 point top rail on the ground, close above this a 42 inch Elwood triangles rail, with 4 inch triangles in 10 series, above this another a light 2 point post with a heavier at 8 inches above, making a 4 foot fence. It is well built & well stretched.
Chris Mountain sheep are said to be
holding their own, increasing in the
Wallowa Mts. Mr. O'Brien reports a
herd of 30 seen a year or two ago +
many smaller bands seen.

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

Fresh tracks of 2 coyotes were
seen in many places in the
pasture and these 2 lost fear
this all the fall. The ranger thinks
they were prisoners. Coyotes are
abundant outside all over the
area country. Many fresh tracks
were seen and are coyote.

Several bears are said to have
done through the fence this fall, by
squeezing over the fence and under
the boards.

Deer are said to jump through
and Mr. Faye shot a large buck
in the pasture a few days ago and
wouldn't be followed whilst jumping
offs and beyond. Mr. Faye + 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
trifying.

No wild cat tracks were seen but
the cats are said to be common.
A few badger tracks are seen and
a badger shining hungry on the cabin.

Badgers, with dig under this cause of damage.
Groundhogs nibble on numerous
rodents around the pasture. They
egress through the mounds but it bothers
them. We will thereby up and down
the fence before counting through them
sometimes turn loose.

There are only 75 from
the pasture and they weighed to bed
in with hay. The dense thistles
would be ideal for them in winter
if some hay was available.

There are said to be several heads
of ills in these, about 20 in one
head. Some are killed every year.

The Oregon game laws are said
to be a failure. There is no law
protecting deer.

2500 sheep were kept in the
pastures through Sept 1st. And
Mrs. O'Brien thinks 2500 can be kept
in it all next summer. The fee
for sheep on the reserve is 79.6
head for the summer. It ought to be
reduced in the pastures for the saving
of birds & protection of sheep.

Still at 150 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 locational and rough work. It is about 100 miles from the end of a river RH over very difficult freight roads and many miles had to be built a long distance to it. The expense for freighting was enormous.

Excessive rates were necessarily paid to get the freighting and other work done promptly. Men were paid $3.50 a day for 8 hour work and poor men at that.

We should ask for a copy of the summary of Mr. O'Brien's report on the fence. I also for Mr. Jenkins' report on results.
other places the houses are built for less than half.

The social and economic changes over the last century have

caused a marked increase in the number of people

living in urban areas. This has led to a growth in

population and an increase in the demand for

housing. The increased demand for housing has

led to a rise in the cost of living. This has

affected the ability of many people to purchase

property. As a result, there has been a marked

increase in the number of people who own their

homes. This has led to a rise in the value of

property.

In conclusion, the changes over the last century

have had a significant impact on the housing

market. The increased demand for housing has

led to a rise in the cost of living, and there has

been a marked increase in the number of people

who own their homes. These changes have

affected the ability of many people to purchase

property, and there has been a rise in the value

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

One pileated woodpecker was even working on the ranted white pine. Many of the dead trees have a large part of their bark stripped by the woodpecker. One caught to be called were working on them. Whisper and other birds may be feeding on them too, so we should know the facts.

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

Rough grouse tracks were seen in the fall, but Blue grouse and sheep tracks are said to be numerous in places.
Nov. 28

Started fro. Olana at 7:30 A.M. r go back to Wallowa at 5 P.M. a little after dark. Had a small day frig out, with a piece of beef in it for Thanksgiving dinner, but woke up for this in a roast goose supper at Mr. O'Brien's. This is the last of a hard 8 day horseback trip. The weather has been clear and pleasant tho cold.

Nov. 29

Got up at 29.54 got back to Elgin. Got a good breakfast of daylight dried at the "Station" van. Some coffee, and got in to Elgin at 10:45 and to La Grande at 12.

Went for a 9 P.M. train to Chetoma 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 2:00 a.m. to Poces at 9:19 M. Waided till 1:30 A.M. for train to Spokane.
Dec. 1. Reached Spokane 7 A.M. left at 11 P.M.

Dec. 2. Daylight in the Flathead River valley. Got up on top of train and looked west at De Smet while waiting for wreck to be cleared off the track. No arrows on train or in Missoula valley, but party a grand rogan & called. The same up alley valley toward the top of Continental Divide, where a light snow laid on ground, about 3 inches deep on tops of pass. Soon disappeared down west slope.

At Helena cold & deep with rogan as along rest of valley. Slept before we reached Livingston.
Before reaching Glendive the Yellowstone River was all open and free from ice.

In 48.3 got up at Glendive & then kept careful notes as this is new ground & important. For about 10 miles followed up Cycles & departs through big badlands. The high buttes have a density of junipers & yellow pines on the backside & along north slopes. The creek bottoms are lined with cottonwoods, asp, willows, & cottonwoods. The sides of some are covered with sagebrush (b. rasa).

Then we come out into shortgrass plains for a long way with little wet grass & small creeks. Then down to another wide valley of some rough country at Sweetwater Buttes. There were the same river bottoms & creeks & a few junipers along the badland banks, lots of Limonium flowers.

Then out over more plains & down to the valley of the Sweetwater with badland buttes & bluffs & terry bottoms & water, plentiful nodes of Bell Alumroot, Il鳄to & Bigelowia, we first seen. They are common on various clothes & open sheltered places on
expansive spindles. There are lots of junipers on the river, mostly on salt slopes, and along streams are Poplar poplars, Willows, Bullbrier, rose thickets and elastics. A large prairie dog town lies a mile or two east of Medora; 20 dogs were counted sitting up in an area of a field in the warm morning sun. Their fuzzy coats glistening in the light.

Near Belfield another large prairie dog town was seen.

After getting out of the Little M. valley we cross wide grassy plains again. At Belfield, South Dakota, we cross creek valleys with cottonwoods, willows, ash, locusts, bullbrier, rose thickets, but with all grass country between.

Then it is all prairie with new farm & grain fields & rarely a bushy tree until we again strike the Red River near Mandan. Here there is Sparse & tough prairie, but only a little Artemisia there. And for the first time we strike Osceola in sw佛罗萨.
chokolberry. A red brown grass like Androsago covers the south slopes of the hills but there is no trace of Altiflex or Sarcobatus.

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

It is dry and still but very cold. The Missouri river is frozen over, the rough cakes of andsclark have set & frozen together. In narrow or rapid places there are still strips of open water but most of the way the line is solid clearances. This is in striking contrast to the open Yellowstone river down Glacier and Yellow Glacier. This morning last night. This is further south but also further east.
**Notes**

**Odocoileus**

Trout duskyed near town near the river flats below town.

**Micrurus Damianii**

A micrurus was seen in the year near the river but not caught. Agouti within edifice was driven away from its site eating a mulatto gum tree seed.

**Thermopylae**

Gold trouts are numerous and large, but have no teeth. The sand is grain hard and ice is 5 inches thick. Lepus longicorne, patches of green-white fur was seen in several places where suck.robbles had been eaten. Traces of tracks on slopes, 4 tracks on hill. Pellets or cuttings are abundant in the flats.

**Putorius longicorne**

A dead fish was found in the flats, chewed up by a dog or coyote probably had been dead some time, shrivelled up. Tracks on slope of flats. Tracks on flats. Lot of deer conch nighted entirely of ground slopes. Fauquea.

**Bismarck, N.D.**

On Sept. 4th, passed over the river flats below town west of the prairie, over big woods with hundreds of antelopes and through thickets of very cotton woods. It is deep and still but so cold I can hardly keep warm with many clothes. I backslid aprofit.

In P.M. Went up over hills and river bluffs above bridge where I found Quercus virginiana and Opuntia microsperma on both slopes of both timber along the bottoms. Found "red year" (Andropogon) abundant on slopes with robes and ground on patches of Helianthus annuus on warm bottom slopes. There seems to be a warm hand of upper Savanna zone on the most favorable slopes, but none over the open country.

Saw fresh dyes tracks north, 20 miles about 10 below town.
Mandan.

Sep. 5. Packed up our tent baggage, then crossed over to Mandan, ramped over hills north & west of town and over the Heart River basin. Fished a stranger element of Upper Sourisan than an eastward trip. The north side of valley is a very warm & protected slope of the bottom and warm & sheltered.

As Upper Sourisan elements we found abundance of Viciae unsatisfying in well weathered soil, all over the south slope. A species of tall red broom grass (Aneuraphis?) give a strong color to the south slopes but not on top of north slopes. Other plants that are probably upper Souris are: 

- Hespatheria
- Oenothera
- Artemisia spp.
- Haploplectus annuus
- Oenothera virginiana & Mentzelia

On the bottoms popular species are: Cattail, wiregrass very indicative Upper Souris.

I want to map the range of the species here closely. Most of the vegetation borders is neutral or occasionally Artemisia cana is common along
dry slopes on this side of the W.R. while
only one small patch was seen on
the east side.

Alumroot (pimpinella) is abundant all
over the prairie, hills & bottoms &
is one of the best fragrant native species.

The woods & the bottoms include many
old cottonwoods, 3 species of willows,
elms, oaks, ash, boxelder, plum, elder,
diery, buckbush, red osier, sumac,
swamp red, & woodland. Climatis
vining fully plumy heads cover the
brushes.

Bluegaz (C. eutata) & magpies
were heard in the bottoms & chieledas.

Two downy woodpeckers were seen but no
other birds. English sparrows were
common & tower.

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

No trails or bushes after getting 2 miles
east of Bismarck.
pretty bad in 1899
disappeared in 1901, very suddenly
about worth
6.20 acres, less 600 tons
1904 usually gets 2600 tons
1904 got 2500 tons
$5000 less this year