

FIELD JOURNAL

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ALEXANDER WETMORE

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MAY 11 TO OCT. 24, 1915.

MAY 6 TO OCT. 31, 1916.

May 11, Tuesday. 1915.

Left Washington via B & O. at 4:55 P.M. Saw Petro at the train. He had expected to leave before I did but could not make. Secured Pullman accommodations through to Colorado Springs. Rate 40<sup>00</sup>, could not buy a ticket farther.

Locust in blossom all along. Above Hancock MD. when we were rising into the Piedmont Plateau much Dogwood still in bloom. Has been gone for a week near Washington. Country covered by but everything is green.

May 12 Wednesday.

cool and cloudy this morning with showers beyond Cincinnati. Ohio river and all streams very low. Leaves fully out though some may exhibit a more complete development later. Locust in blossom here also.

Many acer nequands along track. Maryland yellowthroats, yellow warbler, Song Sparrow and Meadow-lark heard singing.

Have been reading Audubon's Significance of Vegetation in Tropic Valley, Utah, Jour. Agric. Res. Vol I no. 5. Page 370 gives a table of surface evaporation for water

at Nephi Utah.

Average for four years is

April	4.48	Inches	min	3.54	max.	5.82
May	7.04	"	"	5.99	"	8.41
June	9.11	"	"	7.87	"	10.90
July	9.59	"	"	8.72	"	10.52
August	9.16	"	"	7.03	"	10.47
Sept.	6.14	"	"	5.59	"	6.69
Oct.	3.70	"	"	2.98	"	4.43.

In this table October shows a sudden decrease in evaporation. And from this may be deduced the reason for the decrease in Duck mortality in fall on Severe Lake. On that lake there is no sudden increase in water supply. During the ~~summer~~ months ~~Evaporation~~ from the ~~the~~ water surface would take place in the shallows as rapidly as in deep water. During the rapid evaporation of summer this would cause a concentration of salts in the shallows, the deeper water being less affected because of the greater volume of liquid present. With the lessened evaporation of October, the water would tend to neutralize the salt solution by natural flow and thus the concentration on the flats would be

decreased and the effect upon  
the buds of this solution lessened.  
This may hold true in limited  
areas in Utah also.

Shower soon stopped and  
before noon the sun was out.  
Rather hot and quite dusty.  
In western Indiana, Mourning  
Doves appeared in considerable  
numbers and through southern  
Illinois other birds were common.  
I noted numbers of Red-headed  
Woodpecker, several Bluejays and  
Bronzed Grackles.

Arrived in St. Louis 6:00 P.M.

After supper took a hack to Ave.  
Car transferred to Vandeventer and  
went out to the Botanical gardens.  
The grounds were open until  
7:30 so that we had only  
half an hour to look around.  
They were very interesting and it  
is said that 11,000 species of  
plants grow here. The gardens were  
established by Henry Shaw in 1826  
and were maintained by him  
until his death in 1882. Since  
his estate has cared for them.  
Passer montanus has been  
naturalized here but it was too  
late for them to be about.

The following birds were noted:  
Robin, Night-hawk, Quail, Chorney

Swift, Yellow Warbler, English Sparrow  
Caldred

Left St. Louis via Rock Island  
9:06 P.M.

Saw one Green Heron this P.M.  
Collected a number of Staphylinids  
at the garden in some plants which  
known as flowering Buckthorn.

May 13, Thursday.

The sun shining into the  
window of my berth awakened  
me at 5:00 this morning  
and I finally got up at  
six. Reached Kansas City at  
7:35 a.m.

Heard my first Dick Cissel at  
Spring Hill Mo. and from there  
on into Kansas City they were  
common. The grass and trees  
were fresh and luxuriant and  
there have evidently been rains here.

After Breakfast rode out to Swope  
Park and 50 minutes there and  
collected a number of insects.

Dipterids of 3 species were abundant  
in long grass in shade. I had  
no bottle large enough for them.

Insects were attracted to the  
oil smelling flowers of the Crataegus.  
The following birds were seen  
Chipping Sparrow three  
Grackle several. Bluejay one

Bluebird one. Baltimore and  
Orchard Orioles several. 7 ticks.  
Robin, English Sparrow. Red headed  
Woodpecker, Wood Thrush, Meadowlark,  
Crows, Yellow Warbler, Crow, Mourning  
Dove, Cardinal.

Called up Scott Holloway &  
Bunker on long distance. 7 I went  
to Lawrence on the Santa Fe at  
11:00 and I left on the Rock  
Island at 11:35 a.m.

At Lawrence I met Scott and the  
folks were at the station and  
I was glad to see them. The ~~train~~  
engine took water so that I  
had quite a talk.

Kaw River very low.

From Topeka on, on this  
road the growth along the  
creeks shows the influence of  
the great Plains and beyond Clay  
Center this influence was pronounced.  
Elms and boxelder were the  
prevailing trees with an occasional  
sprinkling of Cottonwoods. Many of  
the streams were new gorges of  
steep sided cut into the rolling  
growth and always the growth  
was confined to their banks. Many  
of the streams were dry. All  
of the upland country is in  
wheat.

Praxissels common. Saw Tyrannos

Tyrannus at Clifton.

Very hot this afternoon.

at Belleville were at least two Orchard Orioles in trees about the station. Western Mourning Doves were very common. I saw a dozen or more but most were in pairs or two or three together.

A night hawk was seen not far from Belleville, at that station was a male Robin in the grass.

It was light enough to see until 8:15. Went to bed shortly after nine.

May 14, Friday, 1915

Woke this morning at five and finally turned out at six. The country from here on into Colo. Springs was much like the plains east of Denver. The road followed the bed of a small creek for some distance. At Ramah I saw a number of *Calamospiza melanocorys* & magpie was noted near here and Western Meadowlark was common.

Reached Colorado Springs about 8:05, A.M. thirty minutes late. Went over town to see about a pullman reservation and was pleased to meet Prof. Lantz on the



street. I ate breakfast and then we started to hunt up E.P. Warren. We went first to the museum at Colorado Springs but did not find him, so went on out to his house. He had been down to meet me at the station but had missed me because the train was late.

Warren has a small house out in his yard that he uses as a museum and office and has it full of cases for skins and shelves for books.

He showed me a scheme for fixing bird skins for class use. He makes a skin with the wings and tail moderately spread and runs a wire from the base of the tail to the head letting the ends project several inches. This skin is then mounted in a square frame from  $\frac{3}{4}$  to  $1\frac{1}{2}$  inches thick by having the wires run through the end pieces of the frame, bent over and then stapled down. This supports the bird free in the frame. He then covers the sides of the frame with cellophane. This permits the bird to be seen readily from above and below but prevents injury through rough handling. A good scheme for the Audubon classes. I would

suggest in improvement in wiring  
the wings to hold them out.  
Warren had them fastened with  
strips of isinglass.

Warren also told me of  
Johnson's Ranch near Moun in  
Baca county. Snow made some  
records here for Kansas that have  
never been accepted. This place is  
right on the state line between  
Colorado and Kansas. A small stream  
with its bed ground with brush  
and small stream run along  
partly in Kansas and partly in  
Colorado. Records made here might  
readily be attributed to either state  
and Warren said that he had  
to be careful not to collect in  
Kansas. He secured Beaked Thrail  
there.

Warren also showed the skin  
of a Buffalo of the so-called  
Silk variety. This skin was  
small and was apparently that  
of a cow. The hair across the  
shoulders and down the back  
was soft very smooth fine and  
curly much finer and softer  
than another skin of this species  
that I have seen. These skins  
were very rare and were said  
to have been prized by the Indians  
who used them in ceremonies.

occasions.

Colorado Springs was a pleasant place with wide streets and good houses. The water from the hydrants was excellent.

I left Colorado Springs via D. & R. G. at 12:40.

I sat in the observation cars through the gorge and enjoyed it very much. The season was notably later in Colo. Springs, and a boys than to the southward.

A gentleman who I met proved to be from Hazen, Arkansas. He told me that Hazen is located in a prairie country that is given over to growing rice. Wells are dug from 100 to 200 feet in depth and in these water stands within 20 feet of the surface. Dykes are thrown up around the fields and water pumped up to flood them. An impervious layer 12 inches above the surface keeps the water from escaping below.

Rice is sown from April 15 to the first of June. At that time birds of that from his description were Rice-winged Blackbird swarms or these flocks in great numbers and destroy much of the seed. The grain ripens and is

harvested from August 15 until  
the first of November. Again  
at these times the blackbirds  
come and do much damage.  
If a field happens to ripen  
earlier than the others nearby  
a large part of it may be  
destroyed.

10 Sunday boys were hired to fight them.  
The birds are shot out by shooting but this is  
no longer done.

The ride up through the Royal  
Gorge was much as on other  
trips. I did not notice the altitude  
at all going over Tennessee Pass

May 15, Saturday.

Quite cold last night I spread  
my rain coat over me to help  
keep me warm.

Beyond Green River there was  
evidently more a little rain as  
a few sprigs of green showed  
on the slopes but flowers were  
fairly common.

On our way over the pass at  
Soldier's Camp it noticed that at the  
top willows were barely beginning  
beginning to leave out. I had spruce  
here is slightly less advanced  
than in the east.

From Cross to Salt Lake I saw  
many yellow-headed woodpeckers.

Blackbirds sent in two Coats.  
Clear and warm today.  
Reached Salt Lake City at 1:30.  
went out in to Ogden 10 minutes  
later.

Reached Ogden at 2:40. Stopped  
at the Market and after leaving  
we tried to find Woodpecker.  
The first was fossil wood  
and it was not long since  
it was shot. sent in Blackbird  
Ammonium salt in particular sent  
it in.

The first trout found but  
the second was missing.  
The first was a young (12 weeks)  
but immature - little fish. eyes not  
open in full. you said the first  
was such and you.

May 16, Sunday.

Rose this morning a little before six,  
had breakfast and then went out along the  
Webb River, going up stream from the bridge  
where the bridge to Salt Lake crosses.

The river was rather low for this  
time of year it seemed to me. It was  
running about as full as when I was  
out here last October. It has a broad  
gravelly bed and is in most places  
divided into two or more channels. The  
Balsam Poplars and Cottonwoods were in  
full leaf. Numbers of flowers were seen

I was struck by the dryness of some localities in the stream bed, surprising so early in the season. There were spots with sandy soil raised 3 feet above the river surface and exposed to the sun. Grass was burned dry on them.

Other places with loam mixed with the sand, in places protected by tree growth from the sun's rays were moist and damp.

There was a heavy dew in the lowlands this morning though the uplands were entirely dry.

Along one bank that rose from the river to the bench above was an abundant growth of wild currant, box elder etc. This bank face was damp and moist through the run out of the ground water. The luxuriance of the vegetation was in contrast to the semi arid conditions elsewhere.

I collected quite a number of insects together some of them rather interesting. A number were the same forms that I secured last year. There were a number of other species however that I had not seen. They may aestivate in this arid region as many of the plants do when the soil moisture is exhausted. The insects might be expected to do this as they are dependent upon the plants.

Many willows were in bloom and various wild bee swarmed about them. In one small species the female was orange brown and the male black. The two sexes were seen in copula.

A predacious fly (Cratic?) was hanging by its middle pair of legs (raised above its back) to a twig. While with the other two pairs it turned about a small fly ~~the~~ into which its proboscis was set. The insect being suspended with its dorsum to the twig. Unfortunately it escaped.

A large very dark blue beetle larva was common on *Chrysothamnus* on the bench. I thought that it was a large Meloid.

Birds were common but were mainly breeding individuals. A few migrant Pileolated *Stelendubois* Warblers were seen and that is all. Probably a *Mittaloomis* seen was also migrant. 37 species were seen, most of them Passeriform species. *Colly. grant* were very common and I heard the males hooting constantly.

The sun was exceedingly hot today.

Returned to Ogden about 4 P. M.  
~~Went to~~ Called on Mr. Bigelow and Mr. Neal in the evening but found them both out.

May 17, Monday.

Wes up at six this morning  
did some writing and packed up  
some insects for shipment.

Saw Mr. Bigelow at nine.

He told me that the lease for the  
plot of ground on Bear River head  
had signed and returned to the  
Department and that I was free  
to go ahead with the work.

I promised to let him see the  
page proof of my preliminary report.  
Went to Salt Lake City on the  
10 a.m. trolley reaching there at 11.

Visited Mr. Lewis Mc Cormick's office  
but found him out.

Saw Mr. Finch and Rogers and  
Mr. Benson. Mr. Finch told me to  
go ahead at Duckville and do as I  
pleased. This year I am to pay  
Kamuch-hire to the club instead  
of Joe Cook.

Finch told me that in 1910 he  
walked down the shore of No. 1  
across Pintail neck and through  
Teal Pass dry shod in ordinary  
shoes. Along the channels there was  
only an occasional pool of shallow  
water. He said that early in the  
season as it was dry the ducks  
were very successful in their  
nesting, and that on the trip  
of which he spoke great numbers



of ~~young~~ birds half grown were  
crowded down into the pools  
far from shelter of any kind. and  
that nearly all died.

I saw J. M. Chambus in the  
afternoon. He told me that there  
had been hints that Dr. Fisher & I  
had been "seen" to hold back a report.  
He said that about Nov. 21 last fell  
a big silo at the Garland Sugar  
factory burst throwing about 100  
tons of but pulp into the Malack  
River. Chambus personally saw  
great masses of this pulp at the  
mouth of Channel 1 at Duckville  
near 40 miles down stream. On  
coming back to Corinne he picked up  
11 Mallards & 6 or 7 Pintails helpless.  
In my opinion these birds had eaten  
the pulp and had been poisoned.

Fitch reported "mass" as just  
starting on the flats at Duckville 3  
weeks ago. On his trip up he visited  
Hat Island where he found a large  
rookery of gulls & pelicans. Bird Island  
near there is only a small rock  
and has a few on it and there  
are a few birds nesting on Gardners  
Island.

Made arrangements with Schramm-  
Johnson, 78 West end south to  
purchase goods on form 5 & left an  
O.S.C.

Returned to Lyden at 7:00 PM  
reaching there at 8:00. Put in  
a call for Joe Cook at Duckville  
but failed to find him.

Mar. 18, Tuesday.

This morning the sky was overcast and a drizzling rain was falling. Left Cedar at 8:30 for Corinne. Saw James Snodden and Alex Moyes deputy wardens in Brigham. Arrived at Corinne 10:30.

The telephone to the Duckville Gun Club was out and I was unable to get the gun club all day to ask that a canoe be sent up for me. It had rained very hard last night and cold rain fell more or less all day. It was very muddy and bad getting around.

Arranged with Will Bosby to build the small laboratory at Duckville and saw about the lumber at the lumberyard belonging to Skew.

Also asked Gillette to get some wire. 10 gal. milk cans are worth about 3 dollars.

Nothing much to do all day after this was completed but to watch it rain.

Corinne is going to have electric lights and a grist mill.

A large drainage project to the west of town will throw about 12,000 acres open to cultivation. The water will come from the mountains near Malad.

May 19, Wednesday.

This morning the rain had ceased though it was still cold and raw. Will Bosley agreed to send me down in his launch and I finally got away at 9:15.

In spite of the being the river was low. At the landing stage it was four feet below what it ~~was~~ should be at this season. This is supposed to be the time of high water. The town however that has been general over the valley will help out so that these waters will be used for a week or two at any rate.

Coming down the river I made as accurate a count of the ducks seen as possible. Nearly always the birds were in pairs and when flushed would circle behind us. Each pair ranged in a small area on the river from 40 rods to  $\frac{1}{4}$  of a mile in length. When driven beyond this they always returned. So I kept count of the birds that flew ahead of us. I was able to get at the number with fair accuracy. These birds were mainly about to nest though Bosley says that he has seen nests of Common Teal and young of Pintail at Corinne already this season. A few single males were seen on the river and these probably had mates that

were incubating. In the twenty seven miles from Couder to Duckville the following were seen. The number after each name is the number of pairs seen not ~~the~~ the total number of ducks.

<u>Amerguedula cyanoptera</u>	66
<u>Anas platyrhynchos</u>	16
<u>Chauleasmus streperus</u>	15
<u>patula clypeata</u>	7
<u>Dafila acuta</u>	6

Six male mallards were seen in one flock. They must have been straggled birds.

Reached <sup>the</sup> Duckville Gun Club at noon. The water here is low about two feet below what it should be.

In the afternoon I walked out along Channel 1 ~~and~~ as far as Pintail neck. The water on the flats was much lower than it was when I came last July. In fact the water was almost as far out as it was at the lowest season last summer. The flats east of the gun club that were covered with pools of water last year are now entirely dry. The colony of swans and stilt that usually there has moved down to Pintail neck.

Although the water is low the appearance of the flats is much better than in midsummer. The water is fresh and clear.

Slightly less sediment. The flats themselves are clean. All salts have been washed from the surface mud and there is no scum over the surface mud. The ice in going out this spring has played the surface of the mud and smoothed it down. During high water too the mud has flowed and leveled up the chuck holes.

Botanogiton pectinatus is appearing two or three inches in length.

Mosquitoes were bad.

On the evening it began to rain and the thermometer dropped to 46°.

May 20, Thursday.

This morning I went out 2 1/2 overflow and down No 2 to the south of East Pass.

A count was made of the paired Ducks along the overflow with the following results.

<u>Querquedula cyanoptera.</u>	22
<u>Spatula clypeata</u>	4
<u>Marila americana</u>	5
<u>Anas platyrhynchos</u>	19
<u>D. f. acuta</u>	2
<u>Mergus americanus</u>	3
<u>Nettion carolinense</u>	3
<u>Erismatura jamaicensis</u>	1
<u>Chaulelasmus streperus</u>	4

The water in the flats was almost as low as in midsummer.

The mud however showed the influence of the winter as it was soft even where almost bare of water. Potamogeton was coming up in a few places but the mud was practically bare. The ice has removed much of the surface.

The first four islands in the mouth of east pass were examined but no sick birds were found. I found one dead goose, a female in the overflow. It was old and showed atrophy of the ovaries. The bird was very thin and had died from something other than

the duck malady. The stomach was filled with bulbs & stems of Potamogeton spectinatus.

The water on the flats showed fresher i.e. more nearly resembled the river water than it did when the birds were dying. All that I tasted seemed perfectly fresh.

In the afternoon I dissected the goose and scared for the birds on hand.

It was cold and rained more or less all day. The thermometer stood at about  $46^{\circ}$  until about 4 P.M. when it cleared and warmed up somewhat. Thermometer took at  $56^{\circ}$  at 8<sup>00</sup> P.M.

On the flats were hundreds of Violet Green Swallows and a few Cliff Swallows. All circled slowly over the water occasionally picking up something from the surface. They seemed weak and often alighted on the mud or on bits of drift. Three Violet Green Swallows that I shot had rather low temperatures 105.5, 104.6, 103.3. Unless it warms up soon I am afraid that many of them will die.

May 21, Friday.

Today it warmed up somewhat.

The sun came out and everything was bright.

Walked across the flats to



North Bay:

Carex is growing, new shoots  
and a *Salicornia* (probably *rubra*),  
is coming up in abundance. Most  
of the *Scirpus* is dry and dead  
with green shoots just appearing.  
On the flats along some bay  
however I found a number of  
plants in blossom. At a cursory  
glance this appeared to be *palustris*.  
I collected specimens of it. The  
old heads of *Scirpus* held many  
of their seeds still and form  
an abundant food supply. I  
wonder if the Blackbirds take ad-  
vantage of it in the winter and  
spring.

The blossoming *Scirpus* heads  
were filled with a black thrips  
and a small weevil.

On the flats were many  
empty shells of *Physa gyrina*,  
*limosa palustris* and *Planorbis*  
*trivolvis*.

The surface mud on the  
open barrens was saline to the  
taste and I found little pools that  
were saline also. This salinity  
will increase as the surface  
evaporation increases, the salts  
being drawn up with the ground water  
through capillary attraction and  
deposited on the surface.

I found considerable areas that had been covered with *Sarcopus* but of which only the dead root stalks remained their place being taken by *Salicornia*. Apparently as the water content of the soil lessens the salt becomes too great for the *Sarcopus* while the *Salicornia* is enabled to endure a much greater degree of salinity. Surface mud is less saline in <sup>places of</sup> *Sarcopus*.

The water in North Bay is only moderately high. It extends back into small bays for some distance and has been blown out farther by the wind.

There were many ducks in pairs out here about half of them being Redheads and the others Gadwall and Mallards.

There is quite a flight of Black-billed Plover in now. I shot two fine birds.

The mountains north of Brigham are snow capped now and some snow shows above Ogden and farther down towards Salt Lake City. The Promontory Mountains are bare.

In the evening it became colder again and a severe <sup>drift</sup> storm swept up past Corinne the whole landscape being blotted out in that direction.

May 22, Saturday

This morning the sky was  
overcast. ~~at~~ At 7:30 a. m. the  
thermometer stood at  $46^{\circ}$ .

Walked across the North Bay and  
made a small blind on a point.  
There were a good many Black-billed  
Plover in and I wanted to get  
a number for stomachs. Just as I  
got settled however, a cold steady  
drain set in and continued until  
about seven. The mountains were  
obscured all around and it was  
quite cold. With hunting coat and  
boots I kept dry however except  
for the feet. Only a few plovers were  
flying and I got four nice birds  
besides some willow. It had made some  
decoys of corrugated paper but it was  
too wet to put them out.

This rain made quite a difference  
in the flats. Little pools of water stood  
about on the barrens and the water  
surface of the mud was smooth &  
slight. This mud absorbs and  
holds water directly on the surface.

No sick birds were seen.

Yesterday in turning over two  
short pieces of board lying in the  
Scirpus almost at the water's edge  
I found three nests of *Penthesternus*  
and caught one an adult male.  
The nests were small, 3 in. in

across and contained merely enough material to form sides the roof was formed by the boards. The material used was bits of shredded ~~scrap~~ stems & leaves. These animals ran quickly when disturbed. In one case two nests were found under one board and I wondered if they belonged to a male & a female respectively. One of these boards was moved into a clump of cane and today a completed nest was found under it. These birds make no runways. They must be able to swim (as this area for a long distance is flooded in case of high winds from the north).

About eleven it cleared and was warmer until evening when a north wind sprang up at 8:00 P.M. the thermometer stood at 50°.

This afternoon I had Bosby mark a ~~stick~~ stick 6 feet long off into half inches and placed it in the river at the end of the wharf. The top (first foot) came level with the top of the wharf.

At 8:00 P.M. the gauge registered 2 ft  $\frac{1}{2}$  inch.

The water has risen 4 inches since I came down.

May 25, Sunday.

This morning the sun was  
shining and it was warm. At  
7:30 A.M. the thermometer stood  
at 52°. Water gauge 1 ft 11 <sup>3</sup>/<sub>4</sub> inches.  
After breakfast I walked out along  
the river for the Bear River  
Club. Mosquitoes were very bad.  
The willows are entirely bare -  
out most of them have finished  
flowering. Other vegetation is  
well.

I found only one black's nest  
along here. That of a common  
swallow. A few ring-billed gulls  
and Audubon's Warblers were seen.

On the afternoon I made  
up some traps in the  
evening in the woods & still  
colony to get some pictures. Found  
one dead still in the grass.

Changel seems to be  
filling up. It is much shallower  
than last year.

The wind blew from the  
south in the evening and there  
was a strong breeze of the  
lake in the eve. A storm came  
up in the evening and the  
wind blew very hard.

May 24, Monday.

Water gauge 7:20 a.m. 1 ft. 11 <sup>3</sup>/<sub>4</sub> inches.  
This morning I packed up some  
skulled skins and went in to  
Corinne.

Saw Fred Hansen on the way  
up and met his son Alfred.  
The latter has some very fine  
mounted birds.

They told me that the banded  
birds shot by them were secured  
on about the following dates.  
Green-winged Teal Oct. 17 and 19  
Pintail about Oct 24.

Spoonbill first part of October.

The river closed here last  
year about December 3.

At Corinne - I found that  
the river had raised about two  
feet while at Duckville it  
has come up about six inches.

Rain has prevented Will Boosky  
from doing his work here in Corinne  
so that it will be a week before  
he can build for me.

Schrumm - Johnson, the druggist  
from whom I ordered some goods in  
Salt Lake writes me that because of  
the new liquor law they cannot  
ship alcohol into dry territory i.e.  
to Corinne.

Left Corinne at 4:22 a.m.

Mar 25 Tuesday.

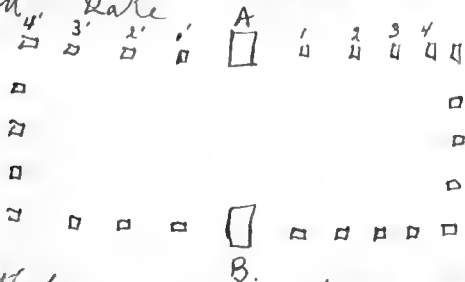
Made few purchases in Ogden first thing this morning. Brownie Bros allowed me a discount on goods bought account government service. I purchased 10 Winchester heady shells at \$2.55 per hundred and Remington shells at \$2.35. They quoted me rubber boots at \$4.90.

Went to Salt Lake City at nine on the trotter arriving at 10.

I saw Mr L.B. Mc Cormick. He told me that water was low on the New State gun Club grounds and that only the channels were full.

Deputy Warden Smith in Chambers office said that there was more water than usual in Utah Lake but that they had no equipment to pump from it.

He described a method of seining fish through the ice in Utah Lake.



Holes six feet square were cut in the ice at A and B.

two points being about 100 feet apart. a rope is attached to a long pole and started at A. The pole is ~~run~~ under the ice at A and pushed out at the little hole 1' the rope is drawn through and again the pole is pushed through at B. This is continued around the square ~~at~~ to C. The same method is followed on the opposite side.

The net is attached to the ends of the rope and ~~is~~ then pulled through under the ice and out at B. a loop foot, or rather a pocket ~~is~~ used <sup>in lining</sup> is done in from 5 to 6 feet water.

Utah Lake has an average of a foot of ice during late December and the months of January and February.

Dr. Stewart put his head in the snow while I was thus inquired concerning the report on peck Kelsias without seeing me and then made one or two uncomplimentary remarks on what we knew about the matter, I sat still hoping that he would imply something more but he went out then.

Mr. Chambers told me that he has cut the season down on Sage grouse to 15 days in September. So late the season of this bird he has



pend (the season) Mourning  
K. does for 15 days.

because of the new liquor law  
is. I know Johnnie faced to ship  
any alcohol to one of Corinne. One  
law reads that liquor shall not  
be shipped into the territory. So I  
got two quarts and put them in  
my suit case.

in a suit case but I purchased  
in a suit case of this returned to  
Edgen arriving at three. Saw Mr.  
Bigelow at the bank. He told  
me that the lease for the tract of  
ground on the Bear River (Club grounds)  
had been signed & returned to him.

No. 1 I talk with Mr. W. N. Marshall  
owner of the Bear River Club. He told  
me that he had heard that the  
snowfall at the head of Bear River  
was normal but that cold spring  
had retarded the melting. As considerable  
head of water is being held in Bear  
Lake for power plant use and that  
may help out to some extent.

~~at Cor~~ in the evening I saw Mr.  
Mr. & Mrs. Bigelow.

May 26, Wednesday.

This morning I went to Corinne,  
left Ogden 9:15 arrived Corinne 10:27.  
Will Bosley in Corinne tells me  
that with two days of clear  
weather the ground will be

enough to haul the lumber for  
the laboratory.

Had a box from Schramm  
Johnson by express. Got the mail and  
left for Duckville.

Arrived at Duckville 2:00 P.M.

Booby says that there has been  
a flight of Golden Plover & other shore-  
birds on South Bay. He captured  
one young one. It was a bit of  
was gone. No sick ducks were  
found out No. 4 or No. 2.

The river has come up an  
additional six inches at Corinne  
but at Duckville the water gauge  
stands at 2 feet. Considerable  
flood wash is running. The  
water is muddier than before.

Collected two violet eyes Swallows  
a Redwing and a Gulf Flycatcher  
and made them up.

May 27, Thursday.

Water gauge at 7:00 a.m. 2 feet +  
thermometer  $50^{\circ}$ . Clear and warm  
all day for the first time since the  
16<sup>th</sup>.

Took the launch and went out  
Brown's Bay to North Bay.

The water here has come up about  
three inches since the rains last  
week. This was shown by the  
Sampshire (*Salmoria ~~growing~~* in ...)

which was ~~growing~~ covered  
by water to that depth & would  
Stills <sup>or avocets</sup> nests were seen submerged  
also. Other Avocets had built  
their nests up to escape the flood.

Water in shallow pools was  
distinctly saline here. Certain pools  
were covered with a sort of  
ferment. Many bubbles rose to the  
surface continually giving off a  
gas. ~~Loose matter was held up.~~ The  
bottom of these newly flooded  
pools held about  $\frac{1}{4}$  of an inch of  
loose flocculent matter with firm hard  
clay beneath. In these pools  
covered with bubbles much of this  
loose matter was held at the  
surface as I observed on dipping  
up some of the foam. This of loose  
kind had a strongly saline  
and alkaline taste. This matter  
held in solution or rather in suspension  
would probably be eaten by birds.  
On the mass of bubbles were hundreds  
of dead diptera, "baty", a few live beetles  
and some chironomus larvae. The latter  
were not aquatic. These insects would  
form food in securing which birds  
would of necessity get much of the  
suspended matter strong with saline.  
Water in flowing out across the  
plate would become strongly  
impregnated with the dissolved matter.

Crusts in the same water would  
be involved in flooding a large  
area. That is the water in the  
van would tend to continue in  
the van and would cover fresh  
ground until it could absorb  
no more of the salts.

Two young warts were  
found, affected by the duck  
malady and two dead  
birds (young) were noted. One of  
the incubation birds, an adult about  
five or six days old was able  
to stand after drinking fresh water  
from the overflow and as an  
shown was entirely recovered. The  
other an older bird was more  
seriously affected. With these  
shallow pools impregnated with  
salts coming up around them  
many of the newly hatched birds  
will die almost at once.

The mud in the bottom of the  
pools was strongly saline.

Not so many pairs of ducks  
were seen today and ~~the~~ more  
of the birds are nesting. We found  
two nests of the Cinnamon Teal.

The banks of Browns overflow  
have built up a great deal and  
regulation along them is more  
abundant and extends further  
down than it did last year.  
A large colony of wrens and

a few Stilts were nesting here.  
Not many other birds were seen  
in their immediate vicinity.  
Carp were abundant.

There are thousands of a  
large Sabamus about now. They  
swarm into a new guide house  
that Cook is building and I  
caught a hundred or more and  
fed them to the young Wovots.  
The fish were rather stupid when  
at rest and were picked up with  
ease.

May 28, Friday.

This morning it was clear  
and the sun shone, until about  
3 P.M. it clouded up. At 6 it began  
to rain and continued at intervals  
during the ensuing night.

Water gauge at 7:00 A.M. 1 ft 11<sup>3</sup>/<sub>4</sub> inches

Went out through No. 2 and  
crossed to Mud Point continuing  
around the point until I could  
see far down South Bay, and  
Many Cinnamon Teals, a few  
Pintails, Mallards, Redheads and  
Gadwall were gathered on No. 2.  
and were breeding in the rushes on  
either side.

A good stream of water was  
flowing out across the flats  
and into South Bay. A northeast  
wind drove a strong current  
to the west.

Thousands of *Ephydra gracilis* were gathered at intervals about shallow skins of water on the flats. They formed black patches on the mud visible at some distances. In these masses they moved about continually feeding and copulating. In feeding they forced the proboscis down into the mud and the surface in these places was ~~strongly~~ heavily pitted. On these spots were many casts apparently of excrement. When started they rose in clouds and settled on the mud surface to run and fly back to the certain spots preferred by them. These were all just at the borders of small pools, seemingly a certain amount of moisture content was necessary.

The mud here was very soft and was strongly saline on the surface.

Near Mud Point *Distamogeton pectinatus* was getting enough of a start so that robbing was difficult. The water here tasted perfectly fresh. I took a water sample here at Mud Point.

A good many dead ducks were seen here on the flats from last year. In many the fat had saponified preserving the skin.

Carp were out here in the shallows in great numbers and were spawning. The females swam back and forth depositing their eggs while the male swam beside them ~~rooting them~~ noosing them strongly in the side. One female that I shot contained more than a pint of eggs. They are tough and hard to kill. I shot this fish twice into its back where it projected from the water and then had some difficulty in securing it.

After dinner made up a few skins and then went to Hanson's in the motor boat. Fred has taken up some more land and has a good stand of wheat and alfalfa on it. This land occupies a low knoll, the last one of importance south of the river in going down stream. Grease woods covered it. Below was a growth of *Salicornia*, *Allenrolfea occidentalis* and other salt loving plants.

The knoll has evidently been the site of an old indian encampment. In plowing bits of pottery and stone were exposed and at the edge of the barrens immediately below we found several arrowheads of chalcedony. On the knoll were many bird bones. a few muskrat

bones and some of larger mammals. I gathered a large number of them. The fragments were mainly wing bones, bits of sternum and pelvis. Hansen held to the theory that there had been a coyote den here but personally I think that it may have been an Indian kitchen midden. It is hardly possible of course that hunters have camped here more recently but in light of the Indian relics the remains are probably more ancient.

This country was surveyed in 1852 when the lake was down. Since then the lake has come up and again receded. Saw a small boat of Indians.

May 29, Saturday.

This morning the sky was overcast. Temperature at 7:00 A.M.  $54^{\circ}$ . Water gauge 1 ft.  $11\frac{1}{2}$  inches.

By eight it was clear and very hot. About 4 in the afternoon it clouded over, rained a little and then cleared again. There was a beautiful rainbow with a complete arch after the rain.

Went down overflow and out across Pintail neck. Took a water sample on the flats in the shallows. Water  $1\frac{1}{2}$  inches deep. The water here was perfectly clear and tasted fresh. M.D. Corisels



and a few Berosus. In ~~smalling~~  
isolated pools were many small  
crustacean Cyclops? These were  
found also in the deeper <sup>water</sup> and  
with them were larger red free  
swimming forms that were very  
active. The water in the small  
pools was slightly alkaline to taste.

Pintail Reed has grown smaller  
since last year. A blind that formerly  
was ~~ready~~ ~~set~~ lay out in the  
water is now almost at the edge  
of the mud flats.

Avocets were common and  
from their method of feeding would  
be easily affected by poison on  
the mud surface. I saw them  
feeding today by swinging the  
head and neck from side to side  
with a scythe like motion and  
raking the bill through the thin  
surface mud. In securing food  
in this manner they must of  
necessity swallow much mud.

With a south wind the  
surf on the cut-off was plainly  
undrilled.

Potamogeton was starting down  
here.

In the afternoon I worked for  
a while on skins and then  
made up part of my May  
expense account.

Mar 31, Sunday

This morning was up at four  
and left at 4:43 for Comm.

Walden gauge 1 ft 11 inches

It was cold riding. I wore  
a flannel shirt and a sweater vest  
and this was not too warm.

The morning ride was beautiful.

For some time the mountains were  
entirely dark. Then a faint ray  
glow touched the tops of the higher  
peaks in the mountains. Range gradually  
it extended down until the

whole range was light. A few  
minutes later the warm rays  
spread over the entire valley.

Arrived in Brime at 7:30

Got mail and my candy and  
left for Lyden at 8:45.

Cherries are ripe now and boys  
were selling them in the station at  
Brigham. Arrived in Lyden at 10:45.

Registered at the Marion Hotel  
had a bath and wrote a  
considerable number of letters, 3 of them  
being official ones.

After the morning went up Cyden  
Canyon. The road up the canyon  
is not very pretty. The  
side prevents a  
clear view while the slopes above  
are hidden by the top of the car.  
Had dinner at the Homebase  
from which I had a view of

view opposite - top. Proterozoic  
walked part way down. The Cargill  
growth U.S. ma - 6 up of  
Populus balsamifera. a few Cedrus  
very seen on the higher slopes  
but none were in the valley. All  
were small

mountain in night here seen  
in places 15 feet high, higher than  
I have seen it previously. Cen  
was common in the slopes  
above.

July 31, Monday.

Went in to Salt Lake City this  
morning at 6.55 via D & R. G.  
The fare one way was \$1.10. And the  
trolley to J. N. is \$1.00. The trolley  
company also make a reduction  
to \$1.00 for the round trip while the  
railroads do not.

Went to Schramm Johnson Co.,  
and had a form signed for the  
chemicals purchased last month.  
Also saw Mr. French and paid  
for 3 boat trips for the club. He  
charged me \$2.00 each.

Was at salt air in the morning  
and went in the water for half an  
hour. Salt air lies about 15 miles  
west of Salt Lake. The land there in  
that direction is covered with many  
pools of saline water. Higher Cen  
is overgrown with greasewood.  
The Deland Salt Co has a large

salt works at the lake shore.  
The salt water is drawn out  
in great diked off pans and  
evaporated.

The lake here had a sand  
bottom from and fine. Much  
of the algae Nostoc sp was  
floating in the water. The  
bathing was enjoyable but not  
so pleasant as in fresh water.

Returned to Ogden at 7:10 P.M.  
and worked until 12 writing out  
my May expense account. Amount  
\$126.72. A. T. expense for two  
months about \$22.

Very hot this afternoon.  
WV

Tuesday,

This morning a few necessary  
purchases were made in Ogden and  
then at 9:15 I left for Corinne.

Much alfalfa that has been cut  
has been ruined by the heavy rains.

I noted Bobolinks near Willard  
apparently ready to breed.

Strawberries and cherries were being  
sold by boys at Brigham. The strawberries  
here in Utah are among the largest  
that I have seen and are fine in  
flavor. They are selling now at 2  
boxes for a quart. Selected berries  
average two inches in diameter. The  
~~boxes~~ little wooden boxes are  
as cups in this country.

arrived in Corinne at 10:27.

Sunday I made arrangements with  
Ben Rowe to haul the lumber for the  
temporary laboratory to Knudsen's Club.  
He took one load yesterday and  
the last of it today.

About noon a heavy storm  
came up with strong gusting  
rain and some hail. Men told  
me that this was the most  
severe rain storm that they had  
seen in Utah. The hail was small  
and I do not think that it  
would do much damage to young  
birds.

One man in Corinne complained  
that the magpies were killing off  
many of his young chickens.  
Left Corinne at 4:00 P.M. Had  
1200 lbs of dynamite aboard besides  
some other things.

Arrived at Duckville at  
of swim. Had intended to pick up  
my lumber on the way down  
but could not make it.

The water gauge indicated 1 ft.  
11 1/2 inches this Sunday.

It had rained heavily here during  
the afternoon.

June 2, Wednesday.

This morning we pushed the flat  
boat up to Knudsen and loaded the  
lumber piled there into it and  
brought it down to Duckville.

north wind blowing make it  
difficult to handle the flat boat but  
finally we got in with it and  
by hard work managed to get  
the matched flooring and timber  
in before a heavy rain came up.  
When the rain stopped about  
three o'clock I made a gate into the  
enclosed space where I will place  
the building and poled the flat  
boat up to the boat house will  
pile the logs by fours outside as written  
will not hurt them.

This the rain today came much  
harder than that will be very hard on any  
young birds that are out. During  
the course of the hail storm not a  
bird of any sort was in sight.  
~~Some~~ all had found shelter. With this  
rain the thermometer dropped to  $48^{\circ}$ .  
It did not warm up again  
during the afternoon.

Several driving rain storms came  
up all around but did not strike  
Duckville.

The river remained at the same  
level until evening in spite of the rain here  
it is so high now that it takes a  
great deal of water to raise it. At  
Corinne yesterday  $1\frac{1}{2}$  inches of rain  
fell without affecting it.

June 3 Thursday.

This morning went to the mouth of No 3 with the motor boat and then rowed down the bay to Slaughter Point.

Water gauge 1 ft. 11 inches. It was clear all day but with a strong north wind.

On South Bay were two large flocks of male Pintails with a few mallards. No females were with them at all. These are birds that must have completed the moulting and deserted the females. One male that I shot had the sexual organs fully developed. The plumage was rather worn. Along the banks of the overflow were a few dead ducks, mainly Pintails and green-winged teal. The larger part of these were left from last fall but a few are birds that have died this spring. One fresh dead bird showed signs of having been shot.

There were of considerable growths of a yellow birdweed and dock on the banks of the overflow and willows have taken root in a number of new places.

Large areas of newly flooded mud were very soft. The water here has come up recently nearly 3 inches.

Past mud point Potamogeton pectinatus is making a good start being much more common.

in growth than it is farther up in  
the bay.

large numbers of Carp were  
gathered in here and were feeding  
on the Potamogeton. Little sprigs of the  
plant came floating down with  
the current. These fish must destroy  
quantities of the Potamogeton. The carp  
were seen just with the back  
half out of water, as we past  
they became alarmed and shot off  
through the shallow water making  
great waves. Some I attempted to  
pass under the boat and ran  
along the side rooting it with their  
nose and splashing water on us.

Bank of S. Caughtry Point in the  
marsh was a breeding colony of ibis,  
Snowy Heron and a few great Blue and  
Night Herons.

good many ducks were seen  
far down the bay among them a few  
greater scaups.

One Red Pelican was seen lying  
on a mud bar. ~~Two~~ Two helpless  
birds were picked up. One was lying on its  
breast on a mud bar and the  
other one floated on the surface of the  
water below S. Caughtry Point. They were  
unable to stand the legs being entirely  
helpless and they had little use of their  
wings. They struck out with their bills  
but without much effect.

of built up the bling on S. Caughtry



point and not in it for while  
but did not see much. The few  
Ruddy Ducks swimming by and  
numbers of noisy Herons were feeding  
off shore.

There is a strong sweep of  
fresh water in here now ~~about~~  
fulmost deep enough in the water for  
the launch. The water was  
clouded with mud from the river and  
was not clear up it later on.  
The north wind brought down  
a stronger sweep of water  
and in going back, we drifted  
badly. It took about an hour  
and a half to get back to the  
mouth of the bay.

Large flocks of pelicans were  
seen both near Lady's Island.  
One bird resting in the water  
could fly only with difficulty.  
The two helpless birds raised  
the head often in gasping for  
breath. I gave them each a  
little water. When water was placed  
in the front of the pouch the spitting  
closed immediately. They did not  
seem at all anxious for water.

At the gun club I put the two  
pelicans in a small pen. One of  
them died during the afternoon.

Charl & Warren went evening.  
Esra Sackett came up in the  
afternoon and was here until

in the evening.

He told me that this year the ice on the ~~bay~~<sup>river</sup> began to go out February 22. The bay had been flooded somewhat over the ice previously - the Ducks began to come in at once and in two or three days sick birds were noted. In March there were a good many sick birds & Sackett at that time was burning off the rushes in order to make ~~all~~ fresh cattle feed next year. After the fire had passed birds were found still alive with nearly all of their feathers singed off. Pintails, Green-winged Teal, Mallard, Widgeon and other ducks were affected.

Sackett said that many <sup>ducks</sup> birds wintered on a stretch of open water fed by warm springs near Honeyville.

He saw Skunk tracks on Hansen's Island last year. He knew of Blue-winged Teal occurring in this region. Last season he trapped 500 muskrat.

June 4, Friday.

This morning I went down 372 below Sackets and crossed into the old River channel through Neely's channel. Water gauge 1 ft. 10  $\frac{1}{4}$  inches.

This channel was blown in here last fall with Dynamite and were running

a strong stream of water. I was  
rejoiced to the level of water in the  
old river bed at least four inches  
during the recent high water.

The old river bed here is a  
channel broader than the river itself.  
It can be waded with hip boots  
in most places. I have a thick  
growth of Potamogeton & moss. Formerly  
its only connection with the  
bays above was a narrow channel  
or run leading into it from  
North Bay. It is this wide that  
it has been left in, so that  
I could have included conditions  
~~into~~ in a channel cut off from the  
main body of water here. Lots  
of long alders & crows, were  
nesting down here.

Hansen's island is low and  
level... away from the flows 3' x 4'  
there are no willows. Small ponds  
at either side are fed by inlet  
from the main channel. This channel  
is undoubtedly very old. ~~They~~ The  
connection with the river was several  
near Sacket's and the old channel  
has not been filled in as ~~so~~ little  
water has come into it except  
through the passage.

In the afternoon I had Bosley  
check up the lumber.

Skinned & dissected the two  
Belians secured yesterday.

June 5 Saturday.

Water gauge one ft 10 <sup>3</sup>/<sub>4</sub> inches  
thermometer 55 <sup>1</sup>/<sub>2</sub> at seven A.M.

Several small showers passed over during the forenoon but on the whole the day was clear. In the evening great cloud masses piled up on the Wasatch range, and in one place there was a spot of red color color as of a fire with a patch of bright green above. At first I thought it was a rainbow effect but finally decided that it was due to reflection on the clouds.

With the motor we went down to Bens overflow towing a row boat and then rounded down to Slaughter Point. A strong southerly wind blew all day long.

At least 600 Pintails with a few mallard and spoonbills all males were banked up on the flats standing quietly on the mudbars. I saw two mallards in a pool back of Slaughter Point that were beginning to molt on the body.

At Slaughter Point is a great area covered with Bulrushes, tules and Scirpus growing in water from 4 to 18 inches deep. In this large number of Snowy, Night Great Blue Herons and also

I collected three or four young birds and took a considerable number of pictures. The birds circled overhead continually but the Herons were gone. The Snowy Herons especially took care to keep out of range. Great numbers of yellow-headed Blackbirds were gathered in here to boot also.

Back of slaughter Point were some large ponds with water & mud in them a foot or so deep. There have been sick birds in last year as I saw a few still lying in the bushes. I gathered a few of these supposed ducks and also collected some muskrat skulls from holes that had been skinned and thrown aside last winter.

I noticed one Pintail that was ~~new~~ recently fresh.

Two Pelicans were seen that were somewhat affected but were able to fly. Yellow chickadee was common on islands down here.

I found a black thrupps abundant in heads of the lule and collected specimens.

Returned to the gun club about four P. M.

June 6, Sunday.

The Today sun shone all day. The sky was clear and all the

afternoon it was hot. Mosquitoes  
and gnats were very bad. I  
was making up a few skins  
in the afternoon but about 5:30  
had to go to work of the insects.  
Water level + 7.00 a.m. 1 ft. 10 in +

After breakfast I walked up  
the river along the willows as  
far as the Bear River Club. In  
spite of the rains the ground  
was so hard and by then the  
grass was beginning to show.  
Did not find a single Duck's  
nest.

late last year the water raised  
about a foot and nine inches  
higher than of present. This drove  
out the breeding birds, but a  
large number of ducks came up  
along the river to nest. Today  
I did not find a single nest  
showing the difference in conditions.

Birds were fairly common.  
Last night I shot a Redwing  
here that had not assumed the  
adult plumage. Its shoulder patch  
was pale and tinged with black  
while the dorsal feathers still had  
many light tips remaining from the  
winter plumage. This bird had the  
testes moderately developed and  
far from breeding size. A raw skin

birds similar to this before notably  
in Wisconsin (May 30) and  
have entered about there.

she may be

1. Old males that have lost  
much of their virility.

2. young males that require  
two years to become adult.

i.e. birds that are bachelors  
during their second year.

3. Birds that have an injured  
or sick and so have not become  
sexually active in a year.

The second hypothesis seems  
the more tenable and I am  
beginning to believe that a large  
part if not all of the males  
require two years to become  
adult. They may or may not  
breed during the second year.

It is not *Phalaropus* Wood  
Pewee in the willows here and  
I believe that it was a migrant  
as the sexual organs were small.

Last night I shot two night  
hawks and consider them as  
migrants also.

From the Bear River Club I  
took in a launch with Webb  
& Peterson past Brown's Conflow.  
Two white gadwalls were seen  
near the mouth of the conflow  
and Peterson who I had on waders

caught ~~them~~ ~~just~~ ~~in~~ ~~the~~ ~~morning~~. One  
was the ~~same~~ ~~species~~ but ~~not~~ ~~distances~~  
but ~~the~~ ~~the~~ ~~could~~ ~~not~~ ~~remain~~  
under the surface. ~~and~~  
rem in and ~~great~~ ~~they~~ ~~in~~  
small ~~pen~~ ~~in~~ ~~No. 1~~. I had  
expected ~~is~~ ~~just~~ ~~with~~ ~~birds~~ ~~here~~  
as soon ~~as~~ ~~anywhere~~. Last fall  
when the water ~~used~~ ~~the~~  
last outbreak ~~of~~ ~~the~~ ~~malady~~ ~~of~~  
any moment ~~on~~ ~~the~~ ~~mouth~~  
of Brown's overflow when the dry  
flats were covered with a shallow  
2 in of water. I have concluded  
have been repeated now  
(see journal for May 27). There  
is this difference however. The  
ducks are scattered now and  
are in pairs ~~as~~ ~~that~~ ~~keeping~~ ~~mainly~~  
to the channels and marshes.  
When they will be in flocks on  
the mud flats and in judging are  
much more liable to be poisoned  
than now.

I swept a few insects  
today but did not find much  
of moment. I found most of  
those ~~in~~ ~~the~~ ~~grass~~ ~~near~~ ~~the~~ ~~water~~. The ~~dry~~ ~~grazed~~  
grass yielded little. 200 ~~beet~~  
Merididae are present here now.  
A pale thrips of small size was  
taken on blossoms of grey willows



June 7 Monday.

This morning Cook went in to Corinne in the canoe, & sent for animal salt and wheat.

After breakfast with Bosley rowed down the river to Sacketts and went out No 4 into North Bay. No. 4 has filled up considerable. During the winter land is badly choked with brush and trees. The water has raised here and is fairly high now. In low water it will be difficult to get through. Diak no 4 was filled with fresh water. The flats south of

the mouth of 4 were flooded. The  
water has come up <sup>our</sup> inches  
here. All the newly flooded lands  
now are covered with fresh  
water. The Rushes back of  
Mallard Point were burned down  
last year - and we are growing  
Cyperus. At the water  
edge for about twenty-five feet  
they stood 8 ~~to~~ feet tall. Farther  
back when the water was less  
they covered until they were  
brought high - they ~~are~~  
alternated with clumps of Int.  
Behind them was a growth  
of Scirpus.

Elvis & I were here had  
just come in here and were  
starting a rookery. I found  
one Elvis nest containing one  
egg but elsewhere the rushes  
were bent over to form the  
foundations.

The sky was overcast today  
but it was warm.

Water gauge at 7:00 a.m. 1 ft. 10 inches.

per agreement against a ptomaine  
theory is this: why ptomaine coming  
from sugar factory waste that  
might affect the birds would  
be certain to kill the fish. There  
is no mortality present among  
the carp.

June 8, Tuesday

This morning, ~~at~~ seven the  
water gauge "low" at 1 ft. 10 1/4 inches.  
The sun shone all day and  
the mountains were almost hidden  
in a haze. I found it very warm.

In the morning I took the  
launch and went up the river  
going out Kundaen No. 1. This overflow  
is also known as Pilla's overflow  
named after a young lady  
Orilla Kundaen. Kundaen No 2  
is called simply Kundaen.

The water has come up here  
more than four inches and  
has flooded considerably areas.  
In several places I noticed the  
scum on the surface formed  
by rising water. A great body  
of water comes out the three  
big overflows into North Bay; at most  
represent about more than one third  
of the volume coming down the river.  
The avocet and Sittas have  
built their nests up 10 or 12 inches to  
escape high water.

I found one sick Mallard  
a bird almost helpless. Its wings  
a male beginning to molt a little.  
~~Another~~ ~~adult~~ was found  
also ~~and~~ I saw 4 dead young about  
another Mallard was reported to  
me here and a few on gadwall.

I hardly look for much more trouble here until another change in the water level comes.

There was a very large colony of about 4 still here.

Returning we went down Brown's flow. The water has raised more than an inch here above what it was on my last visit.

A sick about adult was found here.

The foxtail grass is in great now and is very handsome. I did not realize how much of it grew on these flats. The dock Rumex seems able to grow even when flooded. I notice however that it sends out many fine roots that extend out into the water from the base of the plant and tend to reach toward the surface. Some of the dock is in flower now. On the heads were many dark blue Chrysomelids Gastrosida and two species of Occinellids.

Tried to make a paraffin embedding apparatus from a 4 inch flask. Both flasks that I had however broke while cooling after they had been heated.

Found a location in No 1 for some large pens this evening. Am afraid that No 1 will go

dry this summer.

In the evening I took some letters up to the Bear River Club to be sent out to Brigham in the morning.

June 1, Wednesday.  
Water gauge 7<sup>00</sup> a.m. 1 1/2 inches clear nearly all day though for an hour or two a haze obscured the sky in the morning.

After breakfast we went down No 20 and crossed to East Pass, worked down through East Pass examining several of the islands. There had the *Ecipus* growth covering it dead. No trace of sick birds was found down here.

Going on down we followed on down through the rat trail and past Bond's Pond. Growth of *Ecipus* was on either bank - 26 the east the ground was fairly solid enough so that hunters may camp here in October. The water at the end of east Pass was shallow and hard going.

Below Bond's Pond I could look out across the marsh to the east and southeast and see the Willard Spur. For sixty to 100 feet on either side of the channel that we were following the sedges were green and flourishing. Beyond that they were

all dead kills by the salt.  
This growth of dead *S. cyprus*  
extended clear down around  
Klondike over an extensive area.  
Water in pools when it was not  
discolored had the peculiar clear,  
heavy appearance that the lake  
water does and to the taste was  
intensely salt. There were large  
numbers of Willet in here and  
a few others were nesting. They  
can now expect to raise young  
here on this saline water.  
Some had nests in the edge of  
the salt grass toward the  
spur.

Beyond the dead *S. cyprus* was  
an open barren ~~leading to~~  
reaching to the Willard Spur  
occasional patches of *Distichis*  
*spicata* grew near its inner  
border and little ~~low~~ islands  
of living salt grass were found  
through the dead *S. cyprus* farther  
in. Pools of salt water ~~was~~ were  
on the Barren and a mass  
of some sort heavily encrusted  
with salt was found here. It  
did not go far out here as it  
was late. ~~and~~ Dead birds from  
last year were strewn about  
on all over this Barren. The  
bulbous roots of the *S. cyprus* that  
had formerly grown here had

washed out and been piled  
up in little heaps containing  
half a bushel to a bushel all  
over the flats. These were streams  
about all over the flats and at  
first it was a loss to  
account for them. Finally I decided  
that they were thrown up  
by the water.

I spent the afternoon in carrying  
for skins etc. Called Will Bosley of long  
distance at Corinne and he  
said that he thought that he  
might be able to get down tomorrow  
to start my laboratory.

June 10 Thursday.

This morning at 7 the water gauge  
registered 1 ft. 11 inches. It was very hot  
and close all day.

Went down number 1 this morning  
and put in most of the forenoon in  
watching avocets & stilts on the flats.

There were numbers of carp  
spawning and feeding in the flats.  
Below where they were feeding I  
found a great deal of floating bits  
of roots etc. that had been  
slug up by them. The water was  
roily all about here. I killed  
one large female by striking it with  
a stick. When followed the fish  
get into the deeper parts of the

channel and lie motionless picking  
among the Potamogeton.

In the afternoon Will Bosley came  
and we started in at once on the  
laboratory. We laid the floor and  
raised the frame for the south side  
by 8 P.M. Mosquitoes were exceedingly  
bad.

June 11, Friday.

Will Bosley and I were at  
work this morning until 4:30  
and continued until 5 in the evening.  
We put up the entire frame and covered  
it with rustic but the rafters and  
put on the roof boards and part of the  
roofing.

It was cold this morning  
thermometer stood around  $43^{\circ}$  and  
rain threatened all day. In the  
Wahatch mountains were several  
snow storms and occasional showers  
fell at Duckville. Water gauge this  
morning off  $11\frac{1}{2}$  inches.

There were a great many  
violet green and cliff swallows flying  
down from the mountains and it  
was so cold all day that I  
wore a sweater and a heavy  
coat while working hard.

Early in the morning birds were  
very active but became less  
so later on in the day.



June 12, Saturday.

Water gauge at 7:00 A.M. 1 ft. 11 <sup>1</sup>/<sub>8</sub> inches.  
Was up and at work in the laboratory  
at 4:30 A.M. and worked until 8:00  
in the evening. The roof was finished  
the door hung and the windows  
put in - the table was built also  
and the freeze board completed.

It was cold all day with  
a new wind. The thermometer  
stood at 43° at 4:30 A.M. and  
did not rise above 50° all  
day. A cold wind blew and  
storms circled all around the  
hills. Above Willard considerable  
snow fell in the mountains. Several  
rain storms passed over Duckville  
but none of much importance.  
The S wall was well heard put for  
food today and put in most of the  
time today pushed in the telephone  
& once wire with fathoms ruffled up.

June 13, Sunday.

Was up at 4:30 again this morning.  
Somewhat warmer. Water gauge 1 ft 11 <sup>1</sup>/<sub>4</sub> inches.  
The laboratory was entirely finished  
today, windows screens and all  
and Bosley (Will) went home this afternoon  
Counting 4 hours spent in going and  
coming in his launch on the river  
and one hour in figuring the  
lumber bill for the building he put  
in 49 hours of work for which

he charged me 45 cents an hour  
making \$22.05 for labor. His  
board came to \$6.00.

I have had Ray clear out  
the small brush among the  
big willows just outside the  
north windows, to the river's edge  
to make a landing place and  
give a view of the river. We  
dragged the brush away and  
piled it up on the garden. All  
theavings in bits of wood were  
taken away and dry lumber  
that we could use was  
piled up under the willows.

I moved my stuff into  
the building at once and  
got most of it unpacked  
before dark.

I am very well pleased  
with the building and think  
that it will be tight and  
comfortable.

Telegram from Dr. Fisher today  
from Pendleton Oregon saying that we  
would arrive here June 15.

June 14, Monday.

Finished cleaning up around  
the laboratory today and got the  
rest of my stuff unpacked. Everything  
is in good shape and ready to  
start work. I had Booby check  
over our small pens and

them on the flats beyond the  
lab. on the salt grass outside  
the willows. I got out two  
of the nets for capturing ducks  
alive set them up and  
repaired holes in them. This took  
me some time.

at this we took the small  
launch and went down to  
Bain's overflow. At least 500 Pintails  
with a few spoonbills and mallards,  
all ducks were resting here on  
a small open square. I put up  
two nets here baiting them  
with wheat.

Water gauge this morning at 7  
1 ft. 11 1/2 inches. Very hot today.

June 15, Tuesday.

Water gauge 1 ft 11 3/4 inches.  
Left Duckville a few minutes  
past seven and went in to  
Corinne with Cook to meet  
Mr. Fisher.

Conditions along the river were  
about as usual. Near Christiansburg  
I saw a great field of wild  
mustard in blossom. Wild  
Rose is still in bloom. It  
lasts here a long time.

I saw & heard in Corinne and  
got the bill for lumber. It  
came to \$95.35 but included  
\$14.10 for lumber for pens

The total cost of the building was about \$120<sup>00</sup> or 30<sup>00</sup> less than estimated. A large part of this was saved on labor as I had allowed 30<sup>00</sup> for labor and 12 for subsistence while those amounts were \$22.05 and 6 respectively.

We had dinner in Corinne and left Duckville about 4<sup>30</sup> P.M.

Mr. Fisher and I walked down to the river and collected some insects. I saw only one adult cericid and it escaped. Nymphs were abundant.

Under a board I found a miniature microtus in a small nest that resembled that of Reithrodontomys. The mouse was dead. The skull was kept. The nest was composed of very finely shredded material.

I put the late afternoon and in coming in springing Mr. Fisher the laboratory and talking over the work with him. Mosquitoes very bad. Ephemeroptera seen this evening.

June 16, Wednesday.  
This morning was up at six. The day was clear and very hot. Water gauge at 7<sup>00</sup> 2 feet.

After breakfast Foster and I took  
20 of Fisher in the launch out Ben's  
overflow and then rowed down  
to Blaghter Point and Blaghter Island  
Great numbers of Pintails were  
gathered on a small sly  
flat at Ben's overflow. They are  
nothing considerable now. The  
wheat was cut away from  
in front. The nets here but  
that inside or within the wings  
had not been touched. She  
had been very spotted with  
black increment. I noticed that  
in about 1 out of 4 the droppings  
were worse and white indicating  
some affection perhaps of the  
stuck in the by.

The *Stamnogeton punctatus*  
shows great growth and  
covers large areas. buds are  
appearing upon it. ~~with~~ On the  
Syrphide held by the ~~mass~~  
*Polamogiton* were great areas of  
yellowish green moss.  
Carp were abundant in the  
bay.

We landed at Blaghter Point  
and went back inland through  
the fern country. The water here  
in small pools was clear  
and slightly alkaline. There were  
many coxixits in it.  
I picked up one sick coot

was unable to fly though it  
could run swiftly. The bird  
was put in the boat but  
escaped.

After eating lunch we went  
on down to Foughter Island  
a Scirpus island 40 yards  
in diameter. On the southern  
half the Scirpus growth was  
dead probably from salt water.  
There were dead numbers of  
alkaliflies here and evil smelling  
areas of black mud giving off  
a strong odor of Hydrogen  
Sulphide.

There was a large  
musk rat house here and while  
sitting in it the whining of  
young was heard beneath. We  
plugged and found 7 young about  
5 inches long including the  
tail. The eyes were closed the  
animals were only able to crawl  
about. They were covered with  
a growth of brown hair. The  
beaks were large with great  
blunt snouts. The tail was  
round and rather short with  
a slightly indicated lateral  
compression near its base.  
One that I placed carefully in  
water was unable to swim.  
It was incapable of holding

the large head above the surface  
the heavy overlying sheet water  
well. The flat was  
cavity 12 to 14 inches across about  
six inches below the top of the  
mound.

Returned to the gun club  
about 4 and made up a  
number of skins before dark.  
Mosquitoes were very bad  
this evening and made  
screened windows a necessity.

June 17, Thursday.

Ship morning at 7 the water gauge  
registered 2 ft  $\frac{3}{4}$  inch.

Today we took the launch to  
Nahys canal on  $3\frac{1}{2}$  and then  
paved down the old river channel  
for several miles.

It was very hot today but with  
a breeze that tempered the heat  
- somewhat.

For the first 2 miles the water was  
cloudy showing the influence of  
the river water but beyond it became  
almost clear. There were great growths  
of Potamogeton pectinatus here filling the  
entire channel in most places though  
a few open places were noted. With  
this were masses of floating  
a yellowish green moss that clogged  
the progress of our boat.

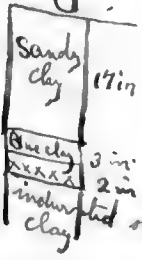
In most places the channel averaged  $1\frac{1}{2}$  to 2 feet deep. We struck a few shoals but it was barely 8 inches but not many.

The banks of the channel were low with growth of salt grass *Distichlis spicata* bordering them.

These were succeeded by a narrow band of *Salicornia subrigida* toward the margin of which grew a few plants of *Kochia vestita*. Beyond were the alkali barrens varying in width. The barrens were succeeded by wet places covered with *Scirpus palmosus*.

at one place I saw a large area where the rise of salt in the soil had proved too much for the *Scirpus* and all the plants had been ~~so~~ killed. The surface soil here was strongly saline.

Not far from the old ferry boat of dug a hole at the edge of a barren that extended white with alkali for half a mile.



The first 17 inches was a deposit of sandy clay soft and moist that has been laid down recently by the river deposits. Below this was a true blue clay. Beneath this was a two inch



deposit of great interest. It was  
the old bed of a marsh with  
the bulbs of *Scirpus* and many  
triangular stems preserved in it.  
The bulbs were easily broken but I  
got out a few entire. Stems of  
*Scirpus* ~~several~~ inches long were taken  
out entire. The soil deposit in which  
these stood was a clay black  
a true palustrine deposit. In it  
and just above the *Scirpus*  
were great numbers of shells of  
*Physa gyrina*, many large *Planorbis*  
*trivialis* and a few smaller  
immense numbers of a small  
*Planorbis* 1/8 to 1/16 inches in diameter  
that may have been immature  
shells of the same species. With  
these were a few dipterous pupal cases

June 18, Friday.  
Water gauge 2 feet 1 inch.  
Packed up a few specimens & this  
morning ~~and~~ with Mr. Fisher went to  
Coring about 10. We stopped for  
a few minutes at the Bear River cut  
and then went on. I was very  
hot today.

Reached Coring about 1:30. Had  
dinner at the hotel and then  
saw Mr. B. M. Shaw in regard to  
the lumber bill for the Laboratory.  
Left for Brigham about 3:20.

Mr. Pease of Corvallis ~~wanted~~  
Mr. Pease had been going to establish  
a gun club at Salt Creek. They  
wished Dr. Fisher to examine the  
grounds but as he did not have  
time he delegated the job to me.  
We reached Eggleston about five  
in time to clean up before winter.  
I found a man in Corvallis with  
instructions to secure specimens for  
an exhibit at the dry farming  
Congress in Denver in September.

June 19, Saturday.

This morning called upon Mr. G. P.  
Bigelow with Dr. Fisher. Mr. Bigelow says  
that Mr. Davis is clearing out the  
Canal bringing water into North Bay.  
Very little was said regarding my  
report.

After leaving here we went into  
Browning Bros and I ordered  
500 16 gauge shells #6 and 200 No. 8 shot  
to be sent to Corvallis by express.

Last night I found that I could  
spend \$100 on my authorization for this  
year and Dr. Fisher wired Mr. M. A. Allen  
to that effect.

Dr. Fisher and I had lunch  
together and then I went to Salt  
Lake City at 1:10 on the Oregon short line.  
I had it ~~Dr. Fisher's~~ trunk with me and  
transferred to the Cullen hotel in

Salt Lake City.

Went to Schramm's and ordered  
some needed chemicals and purchased  
a water bath, stand & rings and  
some other laboratory supplies at the  
Min and Metals Supply Co.

Called on Mr. Chamberlain, game commissioner  
but found him out. Left a note  
saying that Dr. Fisher would be in  
Salt Lake City next week.

Returned to Ogden via the Cambridge  
electric, reaching there at six P.M.  
Dr. Fisher left for the west at 5:40  
P.M.

On the evening I called  
George Parkin at the New State Gun Club.  
He said that he had seen no  
cave birds this season. The water was  
low however so that today they had  
turned the water out of the channels  
and were going to dry up the marsh  
as I had suggested (But. 217).

June 20 & Sunday.

Was called at 5:30 this morning  
and left at 6:15 in a living rig for the  
mouth of the Weber River. Could not get the  
horse that they sent me to cross the  
viaduct so had to come back and  
get another.

The river when I crossed at  
Ogden was high and contained more  
water than when I came out a month

ago. Driveways ditches were full  
all along the coast and I saw  
many small shallow ponds of  
stagnant water. The country appeared  
at its best now the morning  
was cool and pleasant so I  
had an enjoyable ride.

A meadow with broad  
thick leaves was in bloom all  
along. I searched for the butts  
Scleropus but did not find any.  
Killdeer were very abundant  
through this country as were  
Brewer's Blackbirds.

Reached W. O. Belnap's place  
at 8:00 and found when we  
went below to the mouth of the  
Weber. The water is high here, higher  
now than it was last fall when  
I was here last. During the past  
spring I was told that a  
westerly wind had blown the  
ice across the flats and I saw  
when it had reached to a mile  
east of the North shore gun club house.  
Drift was laid up in the salt grass  
and the grass stems were bent over  
by the heavy water.

Last year there were some large  
clumps of *Eriopus* across from the  
club house and below it toward  
the lake front. This spring nearly all  
of this growth is dead, killed by

the advance of the salt water in  
the lake. Under a view the border of  
the swiftly flowing channels had the  
plants buried to two. Here the  
constant supply of fresh water was  
sufficient to counteract the salt.  
It is not easily seen from  
observing this channel that the  
lake is coming up rapidly now.

~~Though~~ The distance is only half  
a mile out from the Club House  
now.

great Barren show  
incrustation of salt and alkali  
classing white in the sun. Shallows  
pools, sand narrow runs bordered  
by dead Sarcobata are filled with  
yellowish appearing water. - somewhat  
saline water. Large quantities of black  
mud loose and giving off an  
intense odor H<sub>2</sub>S very common.  
Even though water is high incrustation  
in general appears rather bad.

As yet there are few ducks in  
here. Large numbers were in the  
upland pastures, alfalfa fields and  
elsewhere along the irrigation ditches  
in the higher land above. is the  
young meadow - it flows down stream  
and congregates on these flats to  
mud and spread the flats  
summer. There is with large quantities  
them that it can be seen here

Water courses somewhat and the  
head concentrates alkalis and salts  
in its pools.

I desired to find  
evidence of sick birds. Three  
helpless pintails were noted. One  
male in eclipse plumage  
was captured. As it flapped away  
across the water ahead of me  
its head swung from side to  
side drunkenly. I saw capturing it  
I found that the eye was  
protruded, and the early symptoms  
followed by the thick discharge  
from the eye.

The following birds were noted  
they were greatly about.

- Pintail (young) 2
- (Adult) 2
- Mallard 1
- & tit 1
- Widgeon 1

It is difficult to get  
through these channels now as the  
water is high and the mud soft  
Near the center the glaze  
we found a deposit of clay  
and a sort of cement like  
shale that is unquestionably  
washed in by the lake. This  
material was found near an  
old hole that had been dug  
for a blind. I brought gradually

that it had been thrown out  
in making his excavation and  
Belnap said that he and seven  
found such deposit in digging  
holes for blinds and can't  
insisted that it had been washed  
in from the lake.

That we examined an  
extensive deposit of similar  
material but at point two  
miles back from the lake here.  
This was thrown up to a  
high bank 6 to 8 feet high  
and extended with an  
abrupt face for one half a mile.  
The material in the main  
was fine but in places fragments  
half an inch to an inch across  
were common. This appeared  
to be a sort of shale. Back of  
this deposit in 5 yards was  
another ~~deposit~~ slightly higher.  
This deposit was plainly  
marked as the bench lines  
along the mountains marking  
the old lake were and is  
found in the same way.  
I have been instructed to  
secure some birds to be mounted  
for a dry season congress exhibit  
in Denver. Today I secured 3  
Brewer's Blackbirds, 1 meadowlark,  
and 3 English Sparrows for this purpose.





June 22, Tuesday.  
 Water Gauge 7 A.M. June 19, 2 ft 1 1/2 inches  
 .. 20 2 ft 3 1/2 "  
 .. 21 2 ft 5 1/2 "  
 .. 22 2 ft 8 "

The drop in the water level of the river June 18 has amounted to seven inches at the mouth of the river a surprising amount. And a matter ~~causing~~ changing conditions upon the flats greatly. Yesterday at Corinne the water had dropped about two feet and a half. Apparently with the warm weather that began June 16 the water in the river was entirely diverted into the irrigation canals leaving only suffrage to continue the course of the river. As coming down flood, Corinne the difference was noticeable. Water is sharply lower now than it was at any time last year. The mouth of Woods Creek was entirely dry. This morning I went down to look at the nets on No. 3. Found nothing in them though birds had gone in and out of one of them. Water was low here and the flats were laid bare as they were during the lowest water last year. Ducks were abundant. I shot three Pintails and spent the afternoon in dissecting them.

June 23 Wednesday.

Water gauge at 7 A.M. up 10 inches

This morning I went up the river in the little launch to Brown's Vlyflow. Because of the rapid drops in the river the water was run from North Bay back into the river through this overflow and Kunder's and R. An all day considerably strong was being reported. Walked out along the bank of the overflow but could see no sign of birds down the whole extent of the bay was almost dry. The water runs slightly saline a few feet up the bank but was not much of them. There were some mosses and ferns. It was impossible to get within 200 yds of a sign of any mammal. Nothing place in the canyon.

Went up along the river and shot a large number of birds. I could not find a single one of the species I had been looking for. I did not see any of the species I was looking for. I was disappointed.

Found a large number of birds in the north bank of the overflow. I shot a few of them. I was disappointed.

July 24, Thursday.

Water gauge at 7 a.m. 2 ft. 11 3/4 in.  
Clear and warm all day.

This morning we towed a Rowboat  
to Brown's Overflow and went out  
into North Bay. There is still a  
very slight current setting into  
the river.

There was enough water  
at the mouth of the Overflow to  
attract much sowing not  
difficult - but found a firm  
sandy bottom at the mouth  
of the Overflow with no  
sand in the immediate course  
of the stream itself. Great  
beds of moss were exposed here  
now left by the receding water.  
There is very little water  
now remaining in the western  
end of the bay.

In the forenoon in front of  
the Bear River Club we captured  
a sick Maltese man that  
was unable to live. He was  
fat and in good condition.  
There is absolutely no reason  
to doubt that he would  
recover entirely in the forenoon.

In the afternoon Mr. Harry Finch,  
Mr. Dick Rogers, Mr. Malcolm Keyes,  
Mr. Hush Sand and Mr. James Knigolson  
came down to clean out  
No. 4 with dynamite.

They were all over at the  
laboratory in the evening for  
an hour or two discussing  
various matters. Not much that  
was new was brought out however.

June 25 Friday.

This morning I went down to  
Sackett and watched them blowing  
out the channel of No. 4 for a while.  
They were placing the sticks ~~to~~ of  
dynamite too far apart and  
results were not very good. I  
tried to get some pictures but am  
doubtful of results. One male  
Cinnamon Teal flew over a shot  
just as it went off and the  
birds barely missed it.

No water was running out No. 4  
into North Bay at all and for  
a part of the distance its channel  
was entirely dry. Lake No. 4 contained  
no water whatever and beyond  
Mallard Point was the first water in  
North Bay.

The water gauge this morning  
at 7 registered 9 ft and  $\frac{1}{2}$  inch.

I went down  $3\frac{1}{2}$  as far as  
the Newby canal and found a  
fair flow of water out  $5\frac{1}{2}$  though  
very little was going out the  
canal.

The party left this afternoon.

June 26, Saturday

Wade page 7 a.m. 3ft 1/4 inches

This morning we towed a rowboat down 3 1/2 to Nubia Canal and then went down the old river bed. Not wind clear all day. Great growths of *Potamogeton* were present in the old channel almost closing it in places. Floating on the surface were masses of yellowish *algae* that clogged the progress of the boat. Today we went down much farther than on other occasions. In one place was the remains of an old flat boat made from *manila* planks. The shores of the channel were lined with occasional clumps of bulrush or cattails. Back of these was a growth of salt grass shading off into *Sarcocornia* and then great stretches of open *barro* or white with a salt and alkali. Small rivulets from the main channel had growths of *Scirpus* bordering them. The channel was quite uniformly knee deep or more. Less salt from North Bay runs a fine stream of water. At its mouth is a sharp hole only a few feet across with very steep sides and could not touch bottom here with an oar. Four main channels lead off from the old river bed in various directions

The water here was clear and fresh with no salt. Ducks were very abundant here. Most of them were Pintails with numbers of Mallards and a few green-winged and Blue-winged Teal. Also where these birds had been resting were covered with their droppings. In passing these places I got a strong odor from it several times. Most of this excitement was from sand and mud but in a few instances I noted that it was iron and greenish or white in color.

On one place at some 12 in. an old time overflow I had left the main channel and fell into a broad lake. The short course of the overflow was well marked in the sand - about forty feet from the channel we dug in (boxed)

Sand	12 in.
Sandy clay	7.
Sand	1 in.
Blue clay	10
Black clay	6
Sandy clay	10
probably black clay.	

The third layer, a thick of sand contained many shells. The first had bits of bullrush etc buried in it. The

sediment in the bottom was all but had the same structure as all the ~~old~~ deposit that I call the old lake bottom. The different layers as indicated were some points with marked

70 yards southwest of this hole  
 at about the center of the old  
 lake I put down another hole.

hard clay	7
Sandy clay	14
Sand + clay in alternation	10
black clay	5
blue clay.	

alkali crust

The third layer of sand  
 or clay alternating contained  
 many shells.

it would be these holes  
 in hopes of finding some bird  
 bones but was disappointed.

June 27, Sunday,

Water gauge at 7 a.m. 2 ft 2 1/4 inches.  
It was clear today but cool. Last night was quite cold, a welcome change from the heat of the past few days. A strong north east wind blew during the forenoon keeping the mosquitoes ~~down~~ <sup>down</sup> somewhat. In the afternoon they were very bad. These flies seem to swarm in the salt grass and I keep out of growths of that plant whenever possible. Fox tail or *Salicornia* growing under exactly the same conditions as regards nearness to water etc. harbor very few.

In the forenoon I worked on a dissection of a male Ruddy shot yesterday.

In the afternoon I collected some insects and did some reading on poisons. A few grey willows are still in bloom. White clover *Trifolium alba* is now in full bloom. Great numbers of *Apis mellifica* (italians) were gathering honey in the blossoms. I found a few plants of the yellow flowered species *M. officinalis* and a few plants of it affinis. White clover and Red clover were both in bloom. Big bumble bees were seen on the red clover and



was found in about clover.  
I collected two pairs of a peculiar  
moth that superficially ~~seems~~ resembles  
*Polistes alpey*. They were in copulations  
resting end to end.

Since the river has gone down  
mud shows of greater or less  
width are visible full along. ~~The~~  
When the water was high the  
roots of the vegetation were covered  
and the carp fed on them under  
water. Now they are forced to the  
surface and I heard the great  
sucking noises noticed last year  
as the fish protrude the heads and  
feed at the surface.

There was a very slight  
current setting out. Not today  
and the water in the river fairly  
flows. It seems clear and  
fresh however.

June 28, Monday  
This morning of 7 the water gauge registered 2 ft 2 <sup>3</sup>/<sub>4</sub> inches. I had a barely perceptible current in the river today. Quite cool this morning with the sky somewhat overcast, threatening rain. This soon cleared away however leaving the day bright.

After breakfast I went down channel 1 in a row boat. Lake No 1 was entirely dry ~~to~~ no water showing in it anywhere. A short distance below and the water in the overflow became shallow so that it left the bank and went in up to. Pintail neck was dry save for a small space near the center. No. 2 had a small amount of water in it. Lake No. 2 was entirely dry. Nothing but mud showed as far as mud point. As the water was so low I could see water but not much. ~~The~~ A small amount of water showed in the east side of east pass. The mud across this great area was still soft and made mud flat. ~~Several~~ ~~masses~~ ~~of~~ ~~stratified~~ ~~lay~~ ~~exposed~~ ~~in~~ ~~the~~ ~~sun~~ ~~in~~ ~~the~~ ~~morning~~.  
The surface of the mud was

moist and still fresh  
no trace of wet. One of the  
small holes that it came out of  
the water.

They were all  
ground down with  
her but most of the  
young. Cowart found  
rather fresh.

it with the water  
it was a southerly wind  
would have the water  
far up the lake. Perhaps the  
may have been the case on some  
previous dry year when they  
began to come up and started all  
the trouble.

I walked back along No. 2 on  
returning but noted little of  
interest save that water was  
low. The ducks were attracted by  
the small amount of water in  
the low end of No. 2 and I shot  
four. One mallard male had merely  
the tip of a wing broken and  
a slight wound in the abdomen so  
that I caught him and kept  
him.

I spent the afternoon in dissections.  
Had Bosby work on the platforms  
for experimental pens. Built a  
shelf for my wash stand and  
repaired the gate leading to the is.

June 29, Tuesday,  
Water gauge at 7:00 A.M. 3 feet 3 inches  
temperature 60°.

The sky was overcast until noon  
with a few sprinkles of rain.  
In the afternoon it was clear and  
very hot.

I spent the forenoon in South  
Bay. Went out 3 1/2 with the  
launch and found a good  
stream of running water greatly  
to my relief. Since seeing Pintail  
Nest yesterday, I have felt  
rather doubtful as to whether  
any birds would remain in the  
country this year or not.

~~There~~ 3 1/2 seems to be the  
main channel of the river now,  
but I found that considerably  
water was running out the  
right hand fork of 3, the flats  
very dry from about 3 o'clock  
Island across to Lady's Island.  
Two channels ran down  
that way giving passage for  
rowboats and there was  
some water on the flats  
between Mud and Biglow's  
points. Below however everything  
was dry save for the channels.  
Thousands of ducks were  
gathered on the flats below  
with large numbers of Pelicans

Coots and a few gulls.  
The ducks were mainly Pintails  
with a great many Mallards  
and a few Cinnamon teal among  
them. Practically all are drakes.

A walking along a long  
distance at the edge of the  
swamp in just what I came  
to water. The soil was firm  
in most places though in a few  
it was very muddy.

One pelican was found unable  
to fly in the swamp and was  
captured. Another was picked up  
along on the flats. Besides these

two I captured a female  
Redhead. The latter was lying  
on the bank as I came along

and went into the water. It  
was captured after a long chase.  
The bird was thin and seemed  
rather weak. I am not certain that  
it has the duck malady.

I hear that the Bear River people  
have so second lot of water coming  
into North Bay through their  
canal now. I also have learned  
that the power company whose  
place is located below the dam  
above have asked for more water  
so that will help the river a  
little. Apparently all the  
river water has been taken off.

June 30, Wednesday.

Washed quays at 7.9. M. 3 ft. sin.

This morning I worked practically all day in getting out my expense account and trip report for June. The amount was 233.75  
Expense for June stands as follows

Form 4	233.78
Booby Salary Form 3	50.00
Chemicals & Abram Johnson Form 5	6.05
humbro. Shaw Form 5	<u>45.35</u>
Trans requests	<u>1.70</u>
Total.	386.88

Expense for May	224.54
" " June	386.88

released in letter of authorization June 18	<u>100.00</u>
	711.42

amount of authorization expended	750.00
balance	<u>711.42</u>
	385.8

It was hot all day but in the laboratory I found it very comfortable. The light is very strong now. In the evening I spent some time in writing notes and official letters.

July 1, Thursday.  
Walt garage at 7:00 a.m.

3 put 3 Schus +.

About 8 I left for Corinne  
with Poplar. On this trip today  
I burned 4 government gasoline  
and used my own engine  
so paid no boat hire.

The water in the river  
now has very little silt in  
it and is green in color. So  
the taste it is slightly saline.  
This was a matter of surprise  
to me.

Not as many birds were  
seen along the stream as usual  
probably not more than  $\frac{1}{2}$  of the  
the number of ducks that  
I noted in May. Several broods  
of young mallard and cinnamon teal  
were noted.

Great bars were visible all  
along and in several places  
the channel was very narrow.  
At Corinne the top of the wharf  
was even with my head. Numbers  
of large dead carp were seen floating  
in the surface. All were dead  
and I do not know what killed  
them.

Received mail in Corinne.  
The voucher for my May expense  
has not yet arrived.

Talked for a few minutes with  
the man in charge of the  
water for the sugar company.  
He said that up above Corning  
at the dam the large ditch  
on the north side takes 55 second  
ft of water in a smaller ditch  
on the south bank & gives 70 to  
110 ft. At present the entire  
stream now for a small amount  
allowed to pass for the use of the  
power station until Whelan is better  
out. At that time they have only  
470 second ft. The ditch  
loses considerable by seepage when  
it first comes out. It had  
been reported that last Friday  
evening had additional water  
had been turned into the river  
from Bear Lake by the power  
company. The gauge at the dam  
had as yet indicated no rise.  
The power house at Whelan  
was running only one machine  
whether they would continue or not he  
did not know. If they shut down  
the rest of the water would be  
turned into the canal. The sugar  
but require a great deal of  
water and then I would be no  
let up in the demand until  
September 1. In other words there  
was no more chance of water



below. In fact the river will probably go somewhat lower.

I left Grimes at 2:15 P.M. and stopped for an hour or more in a willow grove to a half mile down stream. The willows were 25 to 30 feet tall and 10 to 12 inches through. There was an undergrowth of wild currant and wild rose I had found several good sized trees with red berries.

Boiling the water there was a series of ponds the water of which looks rather foul and distinctly saline. These extended here for more than a mile.

Shot two great Blue Herons and a Night Heron in returning. Reached Butte about 7.

July 2, Friday.

Today I put in copying for the birds secured yesterday and in reading on methods in securing Had Bosley skin the larger birds. Graham Davenport from the Bear River Club went in to town today and I wrote several letters to send in with him. A. M. Donald came down from Davis Ranch and brought me a bushel of barley. Water gauge 3 ft 3 1/4 inches. In the evening I went up to Davis place and met Mr. ...

He is a big man, a soft spoken  
scoteman with an enormous chest.  
He says that in a week or ten days  
that is Davis with him half the  
stream of the Malad runs into North  
Bay through the canal. This will  
probably lower the level of the  
Bear River somewhat at the  
Club as the Malad is its main  
source of water at present. The  
Malad is described as a swift  
stream carrying much sediment;  
a stream that very crooked  
forming S shaped bends & through out  
its course. The canal mentioned is  
an old canal formerly carrying water  
to a mill in Corinne.

A Salt Creek (so named) runs  
a considerable stream of water  
into the Bear above Corinne and  
it is this that gives the stream  
its salinity at present. Under  
ordinary circumstances this is  
lost in the great volume of fresh  
water coming down.

That irrigation affects this  
stream enormously. No one can  
doubt who sees it now.

In coming along the  
river I collected a young  
*Tyrannus tyrannus* 4 or 5 days and  
a Red wing somewhat older and  
put them up in formalin. These  
birds when placed on the table

lay prostrate on the breast with  
neck outstretched and wings extended.  
My moving motion was unaccompanied  
and I could detect a tendency  
toward alternation in movement  
in the limbs as in a lizard. All  
attempts at progress however were  
so uncertain that this was  
rather indefinite.

The young Redwing though it had  
no wing claw had a curious  
development that would aid in  
a four limbed progression through  
grass and bushes. The tip of  
the bone of the pollex though covered  
by skin projected noticeably as  
a protuberant somewhat jointed knob  
that would serve all the  
function of a wing claw.  
Clear June 1 way list today.

July 3, Saturday.  
This I went went 3 1/2 and  
out on the flats with a row boat.  
Water gauge at 7:00 a.m. 5 ft. 5 1/4 inches  
There was much more water  
in the flats here than I had  
anticipated and my keeping in  
the center of the bay at low tide  
fairly deep and easy travelling.  
I think that on my previous visit  
here that the water had gone down so  
rapidly that the moss was left  
standing above the surface. This save

The impression from a distance  
of great areas of bare mud  
and reality, there was much  
water and, as the ponds  
have settled down this has  
become evident.

There were ~~some~~ large numbers  
I caught down in the  
still others were gathered in  
the overflows. On passing down  
I heard the hollow sound  
that they make in striking  
against other carp or some  
solid object in crowding away  
from the boat. These fish destroy  
great quantities of plant food  
floating out the Potomac  
that quantities float away with the  
current.

Ducks were gathered in great  
numbers far down on the flats,  
being abundant as far as Slough,  
and most of them were Pintails,  
but a great many common teal  
are in the now and a fair number  
of Spermills. Many body feathers are  
floating on the water now and  
I saw half a dozen remiges in  
one place.

One sick mallard was  
picked up a young bird though  
fully grown. A dead California gull  
was seen.  
In the evening it clouded up

and we had a few minutes  
of rain. Immediately the alkali  
& salt incrustation on the flats  
disappeared and little tiny pools  
were formed. The flats changed  
from pure white to the dull  
brown of the mud beneath:

& wallows appeared tonight  
gathering in for their night summer  
roosts. Perhaps twenty Bank  
& wallows and a dozen or two  
Cliff & wallows were seen.

July 4, Sunday.

Water gauge at 7:00 A.M. 3 ft 3 in.  
The rain last night raised the  
water 1/4 inch. As the flats  
dried this morning the saline  
encrustations gradually crystallized  
again, until by noon they were  
white as ever.

This afternoon I banded some  
young Redwings, Kingbirds and  
Barn & wallows.

Talked for some time with  
Squire M. Donald at the Bear River Club.  
He could not remember how long it  
had been since the old river channel  
was closed.

July 5 Monday.

This morning we went up the river in the launch to Brown's overflow towing a rowboat.

Water gauged at 7:00 a.m. 3 ft.  $2\frac{5}{8}$  inches. The rain above here has raised the river and the stream was carrying more silt this morning than it has for several days.

At found Brown's overflow of low so that the launch could proceed only 100 yards from its mouth. Went on out into the Bay in the rowboat.

There were two broods of young Gadwall in here, one of Pintails and one of Redheads.

I found one Pintail that had died, recently lying on its shore and rotting in a dead Murre. One in the Bay I picked up a dead sick Ring-billed and a California gull. Notes on these follow.

There is a small amount of water in the center of the Bay but everywhere else is entirely dry. A very slight current set out of Brown's overflow. The whole eastern end is almost entirely dry and the water is very much restricted. In the sloughs the California Gull were small amounts of the beds of *Potamogeton pectinatus*.

And these seeds are found almost invariably in <sup>the stomachs</sup> of sick birds (not noted in Egretta or Pelecanus). These cast up on the shore (im. tend to become coated with salt. Picked up and eaten they might cause trouble. This can be readily tried out in any experiment.

Spent the afternoon in working mainly on the Calif Gull. Prepared three blood slides, fixing in Wernick's fluid, staining in Eosin, washing in 50, 70, 80, 95, absolute alcohol and xylol and mounting in balsam. Blood was taken from wing.

July 6, Tuesday.

Wade again at 7:00 A.M. 3 ft. 2 3/8 in.  
It rained up in the canyon  
above yesterday afternoon. This  
morning it was quite cool  
here.

This morning I completed  
dissections etc on the shells on  
which I was working yesterday.

Had Posley repair some old  
pens and I put new catches on  
them. The birds seem to  
be doing well in the large pen  
set in the river in July. I  
had the better counsel with  
such mesh wire to prevent any  
digging out. They did not dig  
very well at first but now  
do not seem to mind it.

The salinity of the river has  
been a cause of worry to me  
but apparently it does not  
affect the snakes.

Ge Muller's information through  
full grown that was severe  
when sick July 5 could not  
stand nor swim. Its recovery  
has been very rapid. When brought  
in the eyes were closed and  
morning it was had almost  
disappeared on the following day.  
Yesterday the bird was quite  
active. Today the bird swims  
and walks though when in the



water the wings droop slightly.

The salt grass flats in front of the laboratory turned brown because of the ripening of the seed heads ten days ago. Already there are signs of fall about.

Quite a number of Bank and Cliff swallows came in to roost tonight. There is a small flight of Shorebirds in. Lesser yellowlegs are seen nearly every day and the Western Sandpipers have come.

Wrens were shedding the fluffy cover from their seed heads when I came down the river May 19 and a few are still doing. The same species of plants seem to sprout irregularly here. I note the same fact in the breeding of the birds. Perhaps this frequent Scotch spells of the spring beecher retards development of physiological activity.

July 17, Wednesday.

Quite cold last night. Thermometer this morning at about 60° with a north west wind. Water gauge at 7:00 a.m. 3 ft. 1 1/2 inches. at 3:00 p.m. 3 ft 0 inches. I do not know to what to attribute this rise unless the rain in the mountains was very

heavy and the water has just  
reached here.

After breakfast Bosley and I  
rowed down No. 1. The channel  
were almost devoid of bird life  
very few ducks seen. Two broods  
of young cinnamon teal were seen.  
The channel was low and  
stagnant. No water ran onto the  
flats still. From the river on down  
masses of *Utricularia* (*phydra*)  
were gathered on the surface  
of the exposed mud at  
the water's edge as ~~the~~ boat  
passed. They rose in ~~waves~~  
as the waves washed up  
on the shore.

Great numbers of clams of two  
species have died here in the  
overflow. Many have been left high  
and dry but others have  
died while under water.  
Dead ones have been fly blown  
and are filled with maggots.

Two dead crayfish, *Cambarus*  
you found in the water.  
Bosley picked up two yesterday.

At the mouth of No. 1  
are great areas of Fox tail grass  
flats that last year were  
under water and bare. The  
growth is dense and erect.  
The grass grows in clumps

with spaces between. The  
Pawnee Sparrows and yellow-headed  
Blackbirds delight to run about  
in these passageways to feed.  
The ground beneath is perfectly  
bare.

In the center of Pintail Neck  
was a small <sup>shallow</sup> pool of water. Elsewhere in East  
Pass and over to Mud Point  
the flats were dry. We crossed  
on foot and opposite Bayless  
Island found a small area  
of mud when we sank to our  
ankles but elsewhere the ground  
was dry or merely moist. This  
moist condition prevailed through  
the upper half of East Pass.  
Below and over was the  
rat trail the ground was  
baked hard and was cracked  
in places for an inch. The  
ground was broken into blocks  
from four or five inches to a  
foot or 15 inches square. Each  
block had the borders warped  
up slightly in drying. The surface  
was slightly <sup>uneven</sup> ~~slightly~~ to the  
last.

The course of the narrow  
crooked rat trail was dry  
and <sup>being</sup> ~~being~~ into it depressions  
were filled with damp mud  
were found. Lower down still

from roots from an inch or  
two to three feet deep, and  
ten to thirty feet long. The water  
in this was absolutely salt  
a strong solution.

Along here the *Scirpus* growth  
showed green near the border  
of the channel but back it was  
entirely dead after nearly a  
mile this gave way to growth  
that had been dead for a  
year or two and this thing  
but was replaced by an  
open level flat where the  
rootlets had been washed  
out of the soil and gathering  
in great masses by the  
tough fibrous runners had been  
heaped up in neat little  
cocks containing from one to  
two or three feet ~~apart~~ bushes  
or more. These were distributed  
over the flat at spaces of  
from 100 to 400 or 500 feet. The  
surface now was covered with  
a whitish incrustation of salt  
about  $\frac{1}{16}$  of an inch thick. Each  
foot mark I showed water in the  
soil beneath. The soil was moist  
but firm. I walked out a  
mile and a quarter at least  
trying to reach the water of  
the Willard spring but could  
not find it and finally turned back

A mirage of water hung  
in front of me half a mile  
away I all the way out but  
by watching the little piles  
of Scirpus bulbs projecting  
I finally decided that what  
was a long ways out.

As Marsh Wrens were common  
all down East Pass and many  
had their second broods with  
young a week old in the cattails  
These birds were common too  
in the Scirpus growth on  
Klondike about the salt pools  
What they do for water I  
cannot imagine.

One or two small Cinnamon  
Teal that evidently had nests  
were flushed along the salt trail  
and two deserted nests of  
the Redhead and several Gull  
nests were found.

By the remaining dead  
growth of Scirpus about the  
Plover I still resting. I saw  
one flock of a dozen Western  
Sandpipers here and a  
few Snowy Plover were noted.  
How they can exist here without  
water is a constant cause  
wonder to me. Food is abundant.  
Killdeer, Curlews, Bendiridin etc.  
were common. Curlews of  
two species were found & a

Spiders was common. The  
head growths of Sciphus were  
this were abundant. One bit me  
on the forearm & caused a painful  
swelling for an hour. When  
these insects were most abundant  
the ground beneath the Sciphus  
was impregnated in salt  
water. In one pool of extremely salty  
water I saw a single Cowbird  
swimming about.

I cut about a half & a West.  
& sandpiper were shot. In  
dissection no trace of intestinal  
trouble was found.

In searching Marsh Wrens  
nests three adult & one  
young *Pitthrodon* were found  
in separate nests 2 1/2 to 3 feet  
from the ground. One was found  
a couple of days ago so that  
this seems to be a common habit.

Muskrat tracks in the bay  
had been abundant all down last  
year and in places where the  
mud was ~~just~~ soft they were  
fairly fresh.

July 8, Thursday.

We started gauge at 7:00 A.M. 2 ft. 8 1/4 inches  
There has been a raise of 7 inches  
since the fourth.

It was hot and clear all  
day today.

In the forenoon took the launch  
and went out 3 1/2 and then down  
as far as Bigelow's point in the  
rowboat.

The current in the river today  
is quite swift ~~of~~ a change  
from the slow movement of  
the last ten days. The water too  
contains more silt though still  
far below normal in that respect.  
A current of was was setting  
out No. 4 St. & Willets through the  
new channel.

The current in 3 1/2 was strong  
and the raise in water was again  
covered the flats here. I went far  
down in the launch beyond where  
I have been before. Many birds had  
gathered in to bed here on the  
flooded marsh. Ducks, Pintails,  
Cinnamon Teal, and many of the  
precolonial. 15th there were  
a good many Willets, little and  
hunts.

One sick avocet was noted  
that could barely fly and a  
still noted sitting down could  
barely fly.

Great numbers of the alkali flies  
were gathered here at the border of  
the overflow. They have been driven  
in here from the flats by the rise in  
water and now their true numbers  
may be appreciated.

One sick California Gull was  
picked up on the flats. It could  
stand with some difficulty but  
could not fly. Another near it rose  
with difficulty. The captured  
bird was clean and seemed  
alert. The eyes however were  
~~protruding~~ ~~apparently~~ ~~forced out~~  
by swelling in the ~~glands~~  
glands. It was quite vicious  
and struck at me repeatedly.

A sick Pelican was seen  
in the overflow also.

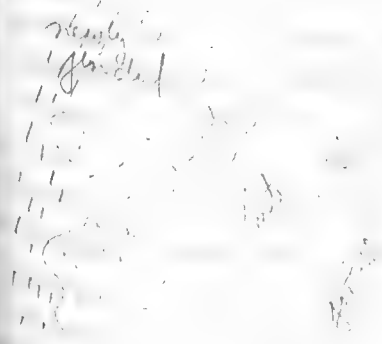
I could detect no difference  
between the water on the flats  
when they were newly flooded and  
that in the overflow by taste.

Returning I crossed into  
No. 3 and went out the small  
overflow where I have come so  
often. The flats here were largely  
flooded also. As the water came  
up it ran back through the  
cracks seaming the soil and  
~~then~~ seeped through the ground.  
So that a damp area from  
me to six feet wide preceded  
the actual flooding of the ground



At the edge of the incoming water was a scum of bubbles. The water in the cracks between the squares of dirt was strongly saline to the taste.

Here on this flat was an area white with salt and around it another area with a hard brownish surface. The water was flooding the latter. The accompanying diagram shows the relation of the two.



When the surface was encrusted ~~square~~ blocks 3 inches thick could be lifted up whole. Three of these I brought back for examination in the laboratory.

After dinner I took the launch and went out Brown's Conflow to see how the water

Conditions were thus. I found the ~~water~~ water in the overflow high with a good current. The spread of water over the flats has been less as yet here than on South Bay. There were first overflows about 1/4 or less of the water supply of the river and so rise in them would be more gradual.

To the east of Browns the water had spread over an area covered with dried moss but to the west had come in very little as yet. Water had seeped in through deep cracks and was standing 20 or 40 feet back of the pools. There was a very small amount of brackish seawater here at the edge of the pools.

In some places it had entered scale of surface vegetation and raised to the surface as the water came in and was floating. A sample of this was taken.

One sick California gull was the only sick bird found & brought it in. Gulls eat the unburied sick birds and it is of course within the possibilities that they become affected from this.

There was a quackwall and a Peaback in New each with

A brood of young These birds  
simulate the behavior of the nest birds  
exactly except that they do not try to  
dive.

A dead myxomat still fresh  
was seen on the bank of the  
overflow. It was an adult.  
And an adult jannah was shot.

A green snake was seen  
swimming across the channel. As  
I came near it stopped and  
watched me and then went on.

Small Bembrodia were seen  
to run out in the water  
struggle for an instant and  
then take flight.

A magpie with the  
trouble was caught alive.  
Notes on it follow.

July 9, Friday.

Cool this morning with  
sky heavily overcast. It rained  
for half an hour or more  
quite hard. Cold tonight.  
Water gauge at 7:00 A.M. 2 ft. 7<sup>3</sup>/<sub>4</sub>  
inches.

Went out there 5<sup>1</sup>/<sub>2</sub> for  
three hours after breakfast.  
The water level here on the  
flats was high giving a  
flooding of good fresh  
water. As this whole  
supply of fresh water is so  
fresh I do not look for  
trouble here among the birds.  
Had the water raised largely  
through that standing on the  
flats results might have been  
different.

Numbers of Cinnamon Teal were  
feeding in the newly flooded  
areas. One that I shot  
was somewhat affected.  
Put in the afternoon in  
working with two live gulls  
secured yesterday.  
Sunset off clear and  
hot in the afternoon.

July 10, Saturday.

This morning the water gauge at 7:00 a.m. stood at 2 ft. 1 1/2 inches.

The sky was overcast for most of the day and it was fairly cool.

Went Bosby out Brown's overflow in the launch. He came back

about 11 with two sick Mallards both immature birds. These were found at the mouth of the overflow. From his report I judged that the water had risen somewhat in the flats.

I spent in part of the morning in working with the two California quills that I am trying to cure. So did not write a lot of writing.

The river has raised until the large pool containing the ducks is flooded. This morning we took the ducks out and moved the pen a few yards up stream. To where there is a small bar. When properly placed it is a fine shelter for the ducks in the winter season. 1/2 of the floor space is used resting spot for the birds. There were four or five big inches long in the pen and it is hard to see how they rest in - but finding one of them had some will to stand on side of the pool

against they were in the water.  
 The other showed more or less  
 of this. They began to retreat  
 but when the water was better  
 immediately turned at the wheel  
 & began to go in the same  
 line as the first vessel had  
 the only difference being that  
 scales were not used.  
 Cuckoo...  
 to...  
 skin.

The...  
 went...  
 so...  
 vigs...

...adverts appearing  
 to be going well they were not  
 at all backward about driving  
 the mullarcts from the feet if  
 their rights were being encroached  
 upon.

In the afternoon we put up  
 two pens 1/2 inch mesh wire  
 with 3 feet high, 3 feet wide and  
 six feet long. These are to stand  
 upon platforms made of flooring  
 matched tongue & groove flooring  
 raised 1 foot from the ground.  
 A circular hole in the center  
 of the base at one end ~~was~~  
 had a dip pan with water.  
 This improved type of pen  
 obviates all danger of any

foreign element coming in. from  
 the soil and since almost  
 absolute control of the conditions  
 under which experiments may  
 be carried on.

The cost of each pen and  
 base is as follows.

72 sq. ft. 1 in mesh chicken wire @ 47 <sup>00</sup> per sq. ft.	.72
53 feet 2x4 - 35 1/3 bd ft. @ 29 <sup>00</sup>	1.02
41 " 1x4 - 15 2/3 " " " " @ 26 <sup>00</sup>	.40
105 " 1x4 flooring 5 " " " " @ 30 <sup>00</sup>	1.05
73 lb staples @ 10	.07
1 lb 8d cement nails	.05
1 lb. 10d nails common	.05
1 latch	.02
1 pr. 5 in strap hinges	.10
1 pan	.50
	<u>\$3.95</u>

Possibly few nails were used  
 than is estimated.

July 11, Sunday.

Water gauge at 7:00 a.m. 2 ft. 8 in.  
Very hot all day today though  
a slight breeze in the afternoon  
kept the laboratory fairly comfortable.  
After caring for the gulls in the  
morning I went down channel  
in a rowboat. Only two or  
three ducks were seen in  
the overflow and other birds  
were scarce quite a contrast  
to what I found last year  
when there was abundance of  
water. There is a moderate  
amount of water in Lake 1  
and 2 now and perhaps a  
little less than one half of  
Pintail neck is flooded. I could  
see water too down the  
center of east pass and  
~~considerable~~ ponds of water in  
area covered the region toward  
Mud Point.

A stringy scum was noted  
at the surface of the water  
on the channel but I could  
not determine what it was.  
No sick birds were seen.

In the afternoon I wrote  
up some notes and a  
good many letters.  
Cared for the gulls twice today  
and  
worked steadily until 8  
o'clock.



Quite a flock of Willet passed  
over about 9:30 P.M. going south.  
learned in the evening that  
ducks were feeding last fall on  
but pulp at the mouths of the  
springs.

July 12, Monday.

Waters gauge 7:00 AM 2 ft 8 1/4 inches.  
A slight shower of heavy drops  
was seen at 5:00. There were  
~~and from~~ ~~with~~ ~~was~~ ~~not~~  
all day though slightly cloudy  
during the afternoon.

Noticed that there is a  
very slight current in No. 1.  
Mr. Perry temporarily withdrew  
at the Bear River Club some in the  
half and hour or so. He returns  
to Perry today and it got him  
to take out some mail.  
The black brought in Saturday  
are doing well.

Went down the river and out  
Brown's land expecting to find a  
few sick birds but what I got was  
none. The water has gone in  
a little more and either side  
of the mouth of the river but  
still a very thick bed  
of moss. At the mouth of the  
Government road, 46 miles  
from the mouth of the river  
all was dead. Several birds  
of young were seen.

seen in the morning that were  
mainly watched. Two birds of  
yesterday were seen also. The  
young of the birds were seen  
to follow with parents. At  
least one at one time they  
of the birds were seen in  
Horn's and I was in attendance.  
As the launch passed the godwits  
flew and all the young followed  
the seal up the bank. I was  
puzzled at first to distinguish  
capturing both species from me  
about.

Spent considerably time with  
the two sick gulls today.  
Found a. Good many shore  
birds willit, godwit + Western  
Sandpipers in the flats

July 13, Tuesday.

Water gauge at 7:00 a.m. 2 ft. 8 1/2 inches.  
The river is slowly going down  
again.

The gulls may become sick in  
two ways. If this trouble is at  
all contagious they may get infection  
from eating the entrails and feces  
of diseased ducks.  
Or if they become infected first  
hand from the water they may  
get it while washing and drinking  
in the shallows. I watched a  
ring-bill yesterday in Brown's Clough

lying in water an 1 1/2 or perhaps  
2 inches deep on newly flooded  
ground and washing and at  
the same time drinking  
considerable quantities of water.

One is at a great disadvantage  
in working with disease among birds,  
None of those affected are able to tell  
what they have been doing, eating,  
or drinking.

Worked in the laboratory  
nearly all day getting at  
the information contained in the  
water analyses that have been  
made last year. Magnesium Chloride  
seems the most promising base  
present.

Sent Bosby down 3 1/2. He  
reported great numbers of ducks  
in the flats but found no sick  
birds. Brought in one young  
Redhead that he had caught.

I packed in express box  
of skins and one or two  
smaller parcels.

It was exceedingly hot all  
day. In the laboratory there  
is usually a light breeze.  
In the evening a storm  
came up from the southwest  
and we had a strong wind  
and some rain. There was  
quite a flight of yellowlegs (flavipes) geese  
Wm & and paper some that

North at dusk. left swimming  
in past the laboratory. This  
seems to be a regular flight line  
here

July 14, Wednesday.

Wally judge this morning 2 ft. 10 in  
The water is steadily dropping  
left at 6:30 p.m. It was  
much cooler this morning  
though clear and hot. I was  
a good dinner at 7:30  
p.m. in a hall

Frank Hillis told me that  
the river raised because an  
irrigation canal above had  
broken. Now the water will  
probably sink to its former level.

dry the willows below  
Kamsuckin now hundreds of  
male Redwings very probably  
gathered here for the molt. Very  
few females were seen with them.

Reached Corvair about 11.  
got the mail and read it.

Received various supplies, 2  
scratch pads, stomach labels  
bottles etc. Had an express  
box from Schwann Johnson.

I shipped an express box of  
salted skins and two packages  
by mail.

Purchased 45 pounds of what  
and some 2x4 and 1x4 lumber  
I need

Saw several muskrats  
carrying grass today. Their  
young must be well grown  
by now.

Left Corinn at 3:00 & reached  
Ruckville about 6:00.

Found that the gull that  
I was caring for in the laboratory  
was dead.

Unpacked mail & express  
box and put the supplies  
received where they belonged.

July 15, Thursday.

Thick morning fog.  
Registered 2 ft. 11 inches. The water is  
dropping steadily. It was hot  
and clear all day today.

Went up the river and out  
Brown's overflow this morning. The  
water in the overflow was quite  
low and between the river  
and north bay was almost an  
exact balance. The ~~current~~ <sup>current</sup> thus  
being slight current in the overflow.

At the mouth of the overflow  
at the island yellowish brown  
tinted water from the bay  
filled the right hand shallow  
channel. The deeper left hand  
channel was still filled  
with silt bearing water from  
the river greyish in color.  
The water was receded  
a great deal in the bay.

in either side.

Two young mallards were  
picked up along the overflow  
driftless. These young mallards that  
I have seen at here 5 in all  
at present are of varying age  
from the same brood. I  
saw them open at the mouth  
of the shallow eight foot  
channel in Brobb's some time  
ago and believe that they  
were raised here. All may have  
acquired infection at one time  
but it may be that some have  
proved more resistant than  
others.

How probably about Cinnamon  
Seal was seen.

A curious brownish stain  
has appeared on the mud at  
the bottom of the river and I  
see the same thing on the flats  
examined microscopically spindle-  
shaped bodies occur of minute  
size giving the color. Ulter  
proferal is associated with  
them. This will be described  
later.

My work here began a year  
ago today. There is so much  
that may be done here that I  
seem to accomplish very little.

July 16, Friday.

Water gauge at 7:00 A.M. - 3 ft. 1/2 inches.  
The current in the river is very slow again & the water is comparatively free of sediment. No water goes out No. 1. not present and the current is stagnant.

This morning I went out into South Bay going down channel etc. There was a till a good current here and it was able to get quite far down with the launch I kept about 1/2 mile in the river boat.

There were great areas of soft mud here & almost water of water and in these were swarms of Western Sandpipers, a few Wilson Phalaropes, and numbers of Marbled godwits. I saw 250 of these latter birds, 27 on flock. ~~With~~ all these shore birds, and flocks of Pelecanus & other birds ~~they~~ ~~made~~ a scene of great commotion and one that I feel was loth to disturb.

A sick Cinnamon and one green-winged teal were captured ~~both~~ adult male in eclipse plumage. Not as many ducks were seen here as usual.

At a gun shot the shore birds rose and circled the Western

sandpipers appearing like swarms  
of bees. I collected six.  
Gooset is long-billed curlew in at  
Washon Sandpipers and a few  
black Cormorant.

I found several hundred  
of the club. I met and  
now talking with him.

I kind I sawal birds in the  
afternoon. And Booky put  
fish mesh wire over the  
bottom of the second large pen  
and placed it in the water.  
The mallards are too large  
and heavy for the smaller  
ducks and it do not wish  
to lose any of the birds on hand  
at present. I hope I will build  
another large pen of fish mesh  
wire and in it will keep the  
birds that are entirely helpless  
that it may see whether or not  
I can not raise my percentage  
of recovery above what it was  
last year. The condition of the  
river is a problem. With  
slight current birds may  
recover at least they viz  
no trouble so far. It will do  
no good by worry about it  
at any rate.



July 17 Saturday

Water gauge this morning registered 3 ft 2 1/2 inches. The river is dropping entirely too fast to suit me. Clear and hot all day but with a moderate breeze that make the laboratory bearable.

Sent Bosly out ~~Rundam~~ No. 1 this morning. He reported that the west end of the bay was entirely dry and that the water in the overflow was very low.

Very few birds were seen. He brought in one sick mallard and an adult female. Gave the birds some Potamogeton brought in from South Bay this morning.

Fred Hammond was to haul a boat into Bingham today from the Duckville Gun Club so I put in my hour or so this morning working with an official report.

Fred told me that formerly the old river channel was entirely dry. He came down from Corinne 26 years in a sail boat with Brown and cut a load of willows along the old channel. Willow growth was then abundant and Brown or many signs were seen. 4 years later the channel was closed and has been low since. Though the level of the channel

was below that of North Bay  
soil conditions were such that  
there was no seepage to fill it.  
Hansen dug a channel across  
from North Bay and the old  
pioneer was being filled with water  
ever since.

Worked at the microscope  
during most of the afternoon.  
We hauled the little launch  
out after dinner. It has been  
leaking badly and needs repairs.

In the evening went in  
swimming. The river water was  
distinctly saline in taste.

After a bath my arms where  
tanned show a whitish deposit  
from the water, probably a  
combination of silt & mineral.  
Many swallows were about  
this evening resting on the wires.  
Ducks and coots have almost  
disappeared from the river. The  
season is far past this week  
~~or perhaps 4~~ in advance of  
what it was last year.

During the last few days since  
July 14 I have noticed that  
as the water slowly receded in the  
river the mud became shallow,  
skins of water along the water's  
edge took on a yellowish  
brown appearance as though  
some sediment had been deposited.  
This was especially heavy in  
small indentations and tiny pools  
almost isolated from the main  
body. This appearance  
was noted along the head of  
channel 1 and was common  
at the mouth of Brown's overflow.  
In my pens it was very  
strong.

On microscopic examination  
I find it due to elongate  
spindle shaped bodies that  
have a slight tendency toward  
a sigmoid flexure. There are  
more spots show in the center  
of the body. These had a slight  
yellowish tinge and were  
sufficient in mass to give  
the color noted. I found  
them represented in sections taken  
floating from the surface of channel  
near outlet of lake 1 and  
Brown's overflow near the island.  
They seem in mass to form  
a film over the surface of the

mud that is coherent and  
pieces ~~when~~ ~~when~~ becoming loosened  
pieces and floats when again  
muddied.

These spindles were present  
in enormous numbers. They  
are I think an algal formation.

Some I fixed in Bouin's  
Picro-formol but as they were  
so small found difficult in  
handling them. I dried one  
film on a slide and tried  
washing it in alcohol but the  
material refused to adhere.

Finally I partly dried a film,  
placed a drop of absolute alcohol  
on it let it evaporate, then a  
drop of xylol let this partly  
evaporate and then mounted  
in balsam.

July 18, Sunday.

Water gauge at 7:00 A.M. 3 ft. 3 in.  
The current in the river is very  
stagnant now.

Today it was hot and clear  
all day long. The nights now  
are cool and pleasant. The  
thermometer in the morning standing  
at times at 60°.

During the early morning I  
did various small jobs - brief  
laboratory work, some writing.  
(About 10:30 I walked  
up along the river as far as  
the Bear River Club.

Small bird life is not common  
here now. I noticed a few  
Savanna Sparrows, two families  
of yellowthroats and in some  
bushes some red winged  
and yellow headed Blackbirds. One  
or two pairs of Kingbirds were  
seen.

The Foxtail grass has gone  
to seed and my heavy socks  
were filled with the long  
hair like heads causing a disagreeable  
itching. Some of the scrub down  
has matured and is drying  
up. All of the plants along  
the river shows the effect of  
dry hot weather being  
shrivelled and brown in places.  
Compass plant has come up long

abundantly.

One or two small heads of sunflower were plucked with a strip of white specimens, were taken. A small one in blossom now.

A fine frog common in the pond. The alkali barrens in several places ~~the~~ brown earth was pepped up through alkali found in traces of puffy crust. firm but readily separable into fine dust.

The salt loving cheyapods will be able to take hold of this another year it believes. Small puffs must have been put in during the last year with the water in the pits.

Just one Mallard last night the first one that was shot.

Notes on it follows. It is the afternoon in evening and water of the pond was the last year at the same place. The water was down with the other gentleman named Sh. I shot from a distance in the line of about 100 yds.

July 19, Monday.

Water gauge this morning 3 ft. 3 in.  
clear and hot all day.

After breakfast walked north  
crossing the river ~~and~~ reaching  
North Bay west of Kindall's Point.

In the eastern end of the  
Bay is a small body of  
water from which a long  
narrow strip runs north of  
the middle going west  
toward Long Point. Elsewhere  
the bay is dry. The water  
was perhaps half a mile  
from the edge of the marsh  
when it comes normally.

Near the edge the ground was  
dry but farther out the mud  
was soft and walking hard.  
Near the ledge a saline scale  
was beginning to form. The  
water in the Bay was  
green. Great quantities of  
Potamogeton were lying drying  
in the sun.

There were many immovables  
in the water plants and  
many Alis, Snow, Nouns, etc  
were gathered to feed on them.

The ducks have almost  
forsaken this part of the bay.  
The only dead bird seen was  
a jays's hen and it was old  
and dried. Several large carp

direct and usually healthy  
cabin was noted. ( )  
Point and round the whole  
Bay by passage to Matland  
Point and beyond. No water  
was coming into it at all  
though the large channel  
continued stretching away.  
Lake visit was strictly dry.  
In six feet rain in the  
rushes and 1500 in Great Blue  
Heron's nests. ( )  
not quite able to fly  
about. These were ( )  
below me ( )  
stilt. ( ) when they  
ran before me aided by their  
flapping wings. I collected one.  
In one nest was a  
great mass of regurgitated  
pellets consisting of feathers  
and bird bones in the cream.  
These ( ) collected. This last  
for bird may have been a  
peculiarity of this one pair. The  
pellets were not present in the  
other nests though I found  
the remains of the substrate.  
Coots & woodrats and stilt were  
the species identified in a  
curious examination. One fresh  
pellet examined was a bolus  
6 by 3 inches and was soft



not being firmly packed as  
are Owl pellets. Old pellets  
were all flattened out in thin  
cakes by the trampling of the  
birds feet.

On crossing the flats  
between the river and the  
Bay large areas where the  
dirt had puffed up through the  
alkali scale were seen. One area  
old pool bed was a large area  
of *Sabicomia* most of which  
was dead or dying. It had  
received a good start but  
the raising salts had been  
too much for it.

On studying the conditions  
the plant succession on  
these flats seems to be as follows.  
Bordering the bays where the  
water is deep are growths of  
bulrush or tules. As the water  
becomes shallow great expanses  
of *Scyphus paludosus* follows these.  
Joining the typical marsh.  
As the siltage increases and  
and the marsh fills in the  
becomes dry. At the higher  
portions where the water  
supply is not renewed constantly  
salines begin to raise in the  
ground water impregnating the  
soil which is by *Sarcobatus*. When  
the marsh is dry and the

Salts are raised by capillarity  
during evaporation. During the  
wetter saline conditions become  
too strong for the *Scirpus* and  
this growth dies. Small  
growth of *Salicornia* with  
a few lettuce and perhaps a  
little *Kochia* appears usually  
as rather sickly growths and  
the *Scirpus* may give way  
to an alkali barren covered  
with a scant encrustation  
and destitute of plant growth.  
As soon as the salt lifting  
plants die the *Scirpus*  
conditions become too strong  
for them also and they die  
out giving way to the  
barren. The land fills  
in a little more and again  
the salines begin to leach out  
of this barren until finally  
*Kochia vestita* and *Salicornia*  
*rutra* are able to take root again  
as this growth extends ~~across~~  
every possible chance to spread  
the area just covered is  
given over to salt grass  
*Histiobolus spicatus*

In the diagram, here made  
 from an actual locality on the  
 flats north of the Duckville  
 Gun Club the dying out of



the growth of *Scirpus paludosus*  
 is illustrated. The great growth  
 indicated by the crosses is  
 already dead. In the center of  
 the diagram is shown a small  
*Cyperus* where the growth is entirely  
 dead only stubs remaining with  
 scattering plants of *Salicornia rubra*.  
 Beyond this is a large area of  
 this last plant with two living  
 islands of *Aristichia spicata* holding  
 plants slightly higher than the sur-  
 rounding. Below this is the  
 open barren distribute of plant  
 growth  
 Mosquitoes are getting somewhat  
 bad again but are not

nearly 20 Troublesome (as they  
were called) the last year.

July 20. Tuesday.  
Water gauge this morning

3 ft. 4 inches

Very hot and close all day.  
Cook went in to Corine today.  
I spent the entire day at  
the laboratory.

~~Washed~~ I ~~out~~ yesterday I  
washed out some bits of  
duck intestine fixed in Biggs' fluid  
and embedded them last night.  
Worked at it until 11:30. There  
was a crowd down from Perry  
but I was too busy to meet  
them.

Made a number of blocks for  
mounting paraffin sections and  
mounted two bits prepared last  
night.

From studying the tabulated  
water analyses I find that  
a sample from the head of  
Channel 1 (Station as it leaves  
the river) shows practically the  
same content as water from Lake No. 2  
(sample 1), Lake No. 4 (sample 2), East Pass  
(sample 3) and the shallows of  
Pintail Neck (sample 4)

14 Compared with sample 13 from  
the flats on Pintail Neck and sample  
from Lake No. 2 when both were

localities were blown dry by a strong wind, and sample 15 from Brown's Overflow from the newly flooded flats, I find in the latter an increase of 7-9 fold in  $SO_4$ , 4-5 fold in  $Cl$ , 4-7 fold in  $NO_3$ . On this same ratio do the compounds  $NaCl$  and  $MgCl_2$  increase.

The sample from Brown's Overflow above contains  $CaCO_3$ .  $CaSO_4$  is not found in the river water but occurs in the other samples. The amount of  $Ca(HCO_3)_2$  and  $CaCO_3$  is greater in the river.

About 6 I went down Channel 1 as far as Lake 1. The channel is very low and stagnant. Many clams (*Sciochorda*) were exposed and in looking through a few I found several pearls. They were found imbedded in the mantle. Two were found in one animal.

July 21, Wednesday.

Water gauge at 7:00 A.M. 3 ft. 4 in. Very hot and close all day with little or no breeze. A haze obscures the mountains and is especially strong toward the south.

Went down Channel 2 this morning. One dead Cinnamon Teal was seen. There were no ducks in here however. Two Mallards were the only ones noted.

Pintail Neck has almost dried off again, water standing only in very shallow isolated pools.

Corixids are very abundant in the shallows here and must form an important food for wading birds. A large *Notonecta* is rather rather I. It seems to be found mainly in pairs under *Rotamogeton* when the water is 2 to 4 inches deep.

Placed two platforms in position with pens on them this afternoon. Bulrushes were placed on top of the pens so that the ends hung down on either side for about half the length of the pens. They were lashed down with willow so that the wind would not blow them away.

This gave from one to three feet of shade at the back according to the altitude of the sun.

The hanging ends give the ducks a slight screen from observation so that they are less wild.

Experiment 24 was begun this evening with two mallards in a solution of  $MgCl_2$  in 10 quarts of water.

July 22, Thursday.

This morning the water gauge registered 3 ft 4 1/2 inches.

It was intensely hot again today. Put the launch in the water again this morning.

After breakfast took the long boat and went up the river to the mouth of Brown's overflow and then went to the mouth in the rowboat. There was practically no current in the overflow and it was very shallow.

At the mouth a considerable number of Mallards with a few Cinnamon teal and Pintails were gathered. Five young Redheads perhaps 2 weeks old were caught here in the shallows without much difficulty as they could not swim deep enough in the shallows to escape detection.

Godwit were common here and two were shot.

No sick birds were seen. Gathered the major portion of the skeleton of a white pelican that has been macerating here.

~~This morning at six I went down Channel! for gunpowder and gathered a red dead clam (Kamovator walrus material) and spent time. Four seals that were~~

July 23. Friday.

Last night I visited Graham  
Davenport at the Bear River Club.  
I had heard shooting during  
the afternoon and as I came  
up to the wharf found feathers  
of a freshly cleaned mallard  
floating on the water. I picked  
up the tail and kept it. There  
was shot all the ducks in  
the flats this spring much to  
my disgust.

Water temperature this morning  
34°  $\frac{3}{4}$  inches. It is cloudy  
and cool all ~~evening~~ day with  
rain threatening. None felt the  
~~relief~~ relief from the glare of the  
past few days was welcome.

This morning I brought  
three young Gadwall and a  
young Redhead into ~~the~~ the  
of the platform pens. These will  
be used as controls to determine  
that ducks will live under  
the experimental conditions imposed.

The birds in pens 1 and 6  
the large pens in the river do  
not put on flesh as they did  
last year. Best I attribute this  
to the time of year and to  
the fact that most of them  
are young birds. They are  
not fat but are in good



This morning I went down  
3 1/2 in the little launch towing  
a rowboat. The little launch  
has been painted a lead color  
and entirely overhauled. It  
does not leak now ~~was~~ ~~not~~ ~~at~~  
all. The bow has been built  
up too so that there is  
no trouble with the waves.  
All together the boat is very  
satisfactory.

The drop in the river is  
very noticeable here in the  
overflows. Through I went  
down about 1/2 for a second.  
The flats at the mouth of  
3 1/2 were ~~large~~ mainly dry  
but below there was much  
water.

Great banks of ducks lay  
as far down as slaughtered  
point. There were large numbers  
of Mallards as well as  
Gimmion Teal and Pintails  
no Spermills very many.  
One sick Redhead an adult  
male was picked up as well  
as a 3/4 grown Mallard.  
Besides these we caught four  
young green-winged Teal (nearly  
grown) and one adult  
that had had the feathers of  
one wing clipped. I did this  
with several last fall on or

two of which escaped me  
but it hardly seems possible  
that this is one of the  
same birds.

I went down past  
Biglow's Point and found a  
good channel all the way.  
Carp swarmed in the overflow  
and out on the flats. They  
are digging up great quantities  
of the Potamogeton.  
Shonbirds were abundant.  
I collected one Gochwit and 11  
Western Sandpipers.

Securicep and mounted  
some Mallard intestines. This  
afternoon. Razor is too dull to  
do good work.

This evening we moved the  
duck pens in the river and  
found that the carp had dug  
a hole beneath one of them  
15 inches deep right up to the bank.  
They are in great numbers.  
Three young ducks escaped  
during the moving.

A good many duck are  
flying up the river in the  
evening now. In fact with the  
limited water they must be  
hard put to it for food at  
times.

July 24 Saturday.

Water gauge at 7:00 a.m. 3 ft. 4 1/4 inches.  
Clear and hot all day today.

July 24 is Pioneer Day in Utah.  
The day on which the first  
settlers entered the valley.  
It is a state holiday, celebrated  
by every one.

John & Otto and family came  
down from Perry today. Fred  
Vansum & wife were down and  
we had a big dinner with  
ice cream and desert at  
noon. There was a crowd  
at the engine house at the crowd,  
above also. Otto has a  
wagon box balanced in the  
forewhale of a wagon that  
is just the thing for travel  
across the flats. It pulls  
much easier than a four-wheeled  
vehicle.

Fast this morning I found  
the young mallard secured yesterday,  
in ~~the~~ dead and spent most  
of the forenoon in working with  
it and in attending to my  
other birds.

To prevent carp from digging under  
the large pens. I had Bailey cut  
up some old boat racks made of  
1 1/2 inch stuff, in lengths of  
18 inches. These were nailed to  
a 1x4 at three quarter inch intervals

like the teeth of a rake.



The free end was sharpened. Two, even, made one for each side. These were pressed down in the mud one for each side of the pen. They can be pulled up and moved should necessity arise. There is only a hundred feet or so of the bar on which these pens rest and I do not care to have it all dug up by the fish. It is considerably trouble to move the pens and besides disturbs the birds.

I have requested everyone not to go along part of the laboratory in order that the birds in the experimental pens may not disturb. The chicks in the small platform pens appear curiously subdued and quiet. The drake mallard in No 4 (Experiment 24) was wild when in the large pen but now is much quieter. Usually the birds lie down when approached standing up and walking about only when it is quite near. They do not bust against the sides when approached quietly unless I lean on the front

of the pen in order that I  
may be in better

Since removing the big drake  
mallard to the smaller pen  
the other ducks in pens  
land to (the fresh water cure)  
are less wild. He was the  
first one to become excited always  
and disturbed the others.  
and in the afternoon Fred Hansen  
and I went down the river  
and out 3 1/2 in my launch.  
A small amount of water was  
running out No 4 and more  
was passing into the Nelly  
Canal.

A good many mallards were  
flying this evening. Fred says  
that he has killed 90 in 110 shots.  
He says that now however he  
has given up the market hunting.  
He is now a county warden.  
It was beautiful in the  
evening. The colors on the  
mountains and across the  
yellowing salt grass are  
magnificent.

July 25, Sunday.

Water gauge at 7:00 A.M. 3 ft. 2 <sup>3</sup>/<sub>4</sub> in.  
The water is much clearer  
and fresher appearing. Yesterday  
in the evening I was in  
swimming and found the  
river water distinctly salt to  
the taste. It is rumored that  
the west canal above on  
the river is very weak and  
is threatening to break. The  
water has been low now  
for some time. When it goes  
back to its normal level I  
expect to see a good many  
sick birds.

I worked most of the  
day in the laboratory. In the  
forenoon was out 3 <sup>1</sup>/<sub>2</sub> with  
Jim Stokes. Nothing out of the  
way was noted among the  
waterfowl. Three men or two  
men and a boy were seen  
catching carp on the flats. They  
must have come across from  
Promontory.

I brought in a quantity  
of *P. lamingtoni pectinatus* from the  
train. I packed 3 <sup>1</sup>/<sub>2</sub> and  
gave it to my controls and  
to the young ducks in the  
fresh water pens. The young  
ducks seem very fond of it.

July 26 Monday.

Water gauge at 7:00 a. m.  
3 ft. 2<sup>1</sup>/<sub>4</sub> inches. The water in the  
river is rising slowly. It was  
cool early in the morning but  
intensely hot during the day.  
I found the birds in Experiment  
25 dead this morning and  
spent much of the day in  
working with them. Full notes  
were made of that experiment.  
Mounted double-crested crows  
birds of intention of Eremites manis  
in the afternoon.

Had Bosley build another  
pen of inch mesh wire and  
also had him clean up the  
platforms used in experiment 25.  
The mud was scraped off and  
then the platforms and pen were  
taken to the river and well  
scrubbed. After this they were  
placed in the sun.

In the afternoon I sent  
Bosley double-crested crows.  
He found no sick birds. He  
sent Graham Davenport who  
had been across the bay.  
He reported that he had seen  
no signs of sick ones.  
Cool went in to Corvina today  
and did not return this  
evening.

July 27, Tuesday.

Water gauge at 7:00 A.M.

3 ft. 2<sup>1</sup>/<sub>4</sub> inches.

Cool today, with a strong south wind. Sky overcast much of the time. In the afternoon it rained somewhat and heavy storms passed to the south. And then went on up the river. The wind was strong for a few minutes and fresh for the laboratory instantly.

Early this morning I went out 3<sup>1</sup>/<sub>2</sub> and then down Kelly's Canal in a row boat. There was quite a stream of water going out the canal but the water in the old river channel was low. The Potomac has sunk below the surface to a large extent and could not trouble us much in rowing.

Great numbers of coots were gathered in here as well as many ducks. Clumps of brush were filled with young ducks, young coots and a fair number of Cinnamon Teal and Pintails that had shed their wing feathers and were unable to fly. As we entered these clumps the birds splashed out ahead of us and glutted away.



Many however refused to come out  
of the sheltering growth and  
swam to one side and hid  
or eluded us in other ways.  
A few birds ran out in the  
grass and these were easily  
captured. I think that many  
more flappers were in here  
than we saw. It was easy  
enough for them to hide in the  
dense growth.

One sick Common Seal and  
a young redhead that was  
affected were captured.  
All told we secured the following

Cook (young)	8
Redhead (young)	4
Common Seal (2 flappers)	4

I found one ~~young~~ immature  
spookbill dead.

I shot one Common Seal that  
I shot on the wing and the  
intestines intensely irritated.

The water about here was  
clear when we got away  
from the canal and rather  
stagnant.

Cook returned from Corning  
this evening and I received  
mail and supplies.

Notes on dissections made today  
follow.

July 28, Wednesday.

Water gauge a 7 a.m.  $3\frac{1}{4}$  in.  
Cool this morning with a  
strong south wind. Went out  
 $3\frac{1}{2}$  this morning and down  
in the flats. The rise in water  
and the ~~cause~~ strong south wind  
combined have covered considerable  
areas again. The shore bird flight  
seemed to have passed for the  
time being. And a letter  
received from Dr. Fisher yesterday  
he suggested that I examine  
the ovaries in early migrant  
females in an endeavor to  
determine whether or not they  
have bred this season. I shot  
three godwits, three stilts and  
several western sandpipers.

One stilt, one godwit and  
three western sandpipers proved  
to be females. The ovaries of  
these were hardened in Zenker's  
fluid.

Most of the ducks were far  
down on the bay.

On walking through the mud  
in growths of Potamogeton in the  
channels I picked out clumps  
of brown sediment. Some of this  
was taken in a bottle. On  
examining it under the microscope  
later I found many of the  
elongate yellowish brown bodies

in that I have noticed before  
and describe the color to them.  
On the return I captured  
a male Pintail that was  
almost helpless. Notes are as follow.  
Many of the Pintails, nearly  
all of the Spoonbills and a large  
proportion of the Cinnamon Teal  
have disappeared and are now  
in molt. The Gadwall too  
have gone into seclusion.  
Practically all of the ducks  
have forsaken the river.  
Nearly all birds have finished  
breeding this season. There  
may be a few Marsh Wrens  
still nesting and Barn Swallows  
are raising a second brood  
but others are through for  
this year. Savanna Sparrows  
are gathered in loose flocks -  
Magpies forage in bands along  
the river and in the evening  
gatherings of Barn Cliff Bank  
could be seen but the swallows  
~~do~~ come in to roost in  
the rushes. Geese now are  
full grown and are seen daily.  
Perhaps it was a rare matter  
to encounter them.  
The mountains were very  
clear today and I shot  
several jacksnipe

July 29, Thursday.

Went to gauge this morning  
3 feet over.

With ... strong southerly  
wind ... near  
observed the ...  
... the valley. Because  
it is ...  
been ...  
Mountain is ...  
last night ...  
blaze ...

This morning I went down  
to ... in the ...  
and then out into the ...  
River channel ... rowboat.

Four duck nets were joined  
together ... poles making  
one long net 25 feet long. This  
we set up at the end  
of a clump of bulrushes  
concealing the ends and  
making a semicircle of the  
net. Then we drove  
through the dense growth  
heading young coots and  
ducks before us. Though  
few of the birds would enter  
the net it served to drive  
many out of the water  
into the short salt grass  
when it was easy to see  
and capture them.  
We used this plan

out - ~~there~~ clumps of rushes  
 and secured the following  
 Spoonbill young 2  
 Coot 5  
 Cinnamon Teal 6  
 Redhead 1

So far as sport is concerned  
 this is much more fun than  
 shooting the birds, and is  
 a much more strenuous  
 exercise too. When captured  
 I tie the birds feet together  
 loop a bit of string  
 around the two humin  
 to hold them on the back  
 and the bird is then  
 helpless. It is then placed  
 in the boat and covered  
 with dry rushes & fresh  
 cut *Scirpus*. This is sprinkled  
 with water and the birds  
 seem to feel the heat a  
 great deal. They must not  
 be left in here too long, largely  
 before untying them and  
 placing them in the pens I  
 have been taking several captives.  
 They very surprisingly get  
 bring the birds out of the  
 boat one at a time as if  
 several are brought at once.  
 They stamp & struggle and in  
 consequence raise the temperature  
 up. I find that a bird

of small size that is a hot  
and that drops in water  
has the body heat markedly  
reduced in half a minute  
even though it be still alive.  
An adult bird plunging  
into water unless it can  
get to them at once it is  
not record the temperature.  
with insects the body is  
slightly cool with composites  
it is practically nil.

I had a Magpie dropped  
within 55 yards of the road  
in the overflow drop.  
5 degrees below what it  
should have registered before  
I could get to it. Now  
I am making an effort  
to determine the sex of each  
bird whose temperature I  
record.

The bird secured yesterday  
was seen this morning and  
was found to suffer from  
shot poisoning. It was much  
interested in this case as it  
is the first one that it has  
found. It was shot by 15.40.  
A single shot in the ventral  
The birds in the pen  
trample the dead birds and  
apparently pay no attention

to them. This bird was  
wet and bedraggled and  
the two birds I had actually  
given it all night in a cage and  
then they were dead.

This afternoon I had  
Booby make some more racks  
of laths for pen No. 1 and  
these were put in place this  
evening and the pen filled  
in with the carp heads  
then began. We worked at  
this I should say.

It requires considerable  
pain to put these birds  
down and will have to  
lay in another supply of  
strong laths as well as  
fly catches and ~~netting~~ every  
insect that enters the pen.  
Bluebottles attracted by the  
ordure have ... about half.

July 30, Friday

Water gauged at 7:00 A.M. 3 ft. 1 inch.  
This morning at 6:30 it was  
cool and pleasant but later  
during the day it became  
quite hot. Worked at the laboratory practically  
all day.

The Mallard ♂ in Experiment  
24 was dead this morning  
and a critical dissection was  
made of it.

After dinner with Bosley  
I made a short trip down  
3 1/2 on the launch and  
secured some Potamogeton for  
the ducks.

The flats here are drying  
rapidly at a point where the  
mud was first exposed I  
found a pebbly crust forming  
~~that~~ <sup>the</sup> mud was moist beneath as  
in the barrens. The salts here  
have been drawn up by  
capillary attraction through  
surface evaporation and  
deposited. ~~It~~ Considerably areas  
immediately at the mouth  
were covered in this way.  
When water rises and dries  
this ~~then~~ will be sick birds  
caused by it.

Nansen's team ran away  
here this afternoon started



by Cook's motorcycle and was  
down most of the telephone  
line. It was repaired by  
evening however.

Muggis have been troubling  
me somewhat by straying  
mat. ~~to~~ This evening I  
cut up some apricots and  
put a crystal of  $\text{I} \& \text{trychium}$   
sulphate into each flat and  
spread them around.

August 1, Sunday,

Water gauge at 7:00 a.m. - 2 ft. - 11 <sup>3</sup>/<sub>4</sub> in.  
thermometer 60°. A cool breeze blowing  
so that it was almost cold.

Arose at 6 and packed a lot  
of stomachs that had been died  
yesterday. Attended to the birds.  
Found one dead spoonbill in no 6  
and coot that was looking dumpy.  
left for Corinn at 8:40 arriving  
at 11:25. The weed growth of  
the summer has obscured outlines  
and changed the appearance of  
some parts of the shore line  
noticeably. I see a great many  
sunflowers.

Near Knudsen's there was a  
sick Pintail in the river ~~at~~  
farther up were many Mallards  
and Redheads but no sick ones were  
noted.

A gasoline engine has  
been placed on the river bank to  
throw water into the Chesapeake  
Bay. This is almost dry now.  
I am certain that if this is  
done there will be sick birds  
there.

Ate dinner at the hotel in  
Corinn. Busy with my  
Received my mail and bargained  
for 5 bushels of wheat and Barley  
mixed with Mr. Perry.  
I had intended going to

Left on the afternoon train but  
from ~~Mr. [unclear]~~ Clarence Nelson  
and W.M.P. and his partner in  
the Corvair Drainage District company  
I learned of salt beds on  
a mark of the salt Creek where  
they have not been known before.  
This region can receive some  
surplus drainage water from Bear  
River but there is no possibility of  
water from the Malad River entering  
it. This would eliminate all  
possibility of trouble from sugar  
factory drainage. I decided  
at once to visit the locality  
and secured a room at the  
hotel.

Part in part of the afternoon in  
writing and long report to Mr. [unclear]  
on work of the past two weeks.

Met Mr. Snyder, a drainage  
engineer from Salt Lake City who is  
working for [unclear] & Co. He has  
visited the Basin Lake country and  
says that there is water in  
small lakes west and south of  
Basin in small town where [unclear]  
digs may be laid. Basin is 22 miles  
from Basin Lake. They and [unclear]  
who worked in [unclear] [unclear]  
Building. I all [unclear] have [unclear]  
project of some sort near [unclear]  
that can give me information  
regarding that [unclear] situation - Mr.

Ray is the better man for me to see. Both men are sportsmen and will be glad to give information.

1906 Mr. J. S. Snyder told me that he helped stake out the Western Pacific at the point where the line crossed the so-called Great Salt Desert about 7 miles from the mountains to the west he noted several dead ducks and a dead hawk lying on the salt plains. A fact perhaps not of great significance but still worthy of comment.

I have heard talk here of the trouble caused by the bite of the deer fly, the one with blotchy wings. I saw Mr. Adams this evening and obtained a thorough account of the trouble.

This ailment has long been known for 30 or 35 years and was attributed at first to water taken into the system. Of late years it has been ascribed to the bite of the deer fly.

Mr. Adams ~~was~~ ~~the~~ underwent an experience with it several years ago and described the malady as follows.

He was bitten about 2:00 P.M. while in a field attending to an irrigation ditch. Bites took effect on the ear and on the neck of the neck near the glands.

Returning home about six he was overcome with a great lassitude, a disinclination to do anything, and a lack of interest in affairs of importance. This was followed in two hours by aching in the muscles of sides and back and of the back in general accompanied by a violent tremor evidenced by the chattering of the 48 hours the bites began to itch and bleed this continuing for a week. The most affected was much irritated, and soon in appearance and the skin about the bite sloughed. The bite of the next swelled and suppurated as a sort of boil and was finally lanced in a week. In two weeks most of the symptoms disappeared. Symptoms were those of a mild typhoid and diagnosis was typhoid by two physicians or something similar to it. Dr. J. M. Dart (only initials) of Salt Lake City a noted local diagnostician called in and said that it was not typhoid and that he did not know what it was but that it might be a malarial attack.

Four periods occurred twice each day with a temperature of  $103^{\circ}$  to  $104^{\circ}$ . These were followed

by severe chill.  
Mr. Hart that afternoon visited  
the headpeake Bay and was  
himself bitten and infected.  
Returning to Salt Lake he underwent  
much the same symptoms as  
Mr. Nelson. Doctor friends pronounced  
it typhoid and I was induced  
we here he refused to undergo  
treatment for typhoid. I will that  
time that trouble has been generally  
attributed to sheep bites and it  
is known that not all flies give  
it. The trouble is confined to  
this immediate vicinity in Box  
elder County and has not been  
observed elsewhere in the state. The  
localization has long been known  
and formerly the boils on the  
neck were known jokingly as  
Bear River sores.

Two in cases is frequently  
accompanied with delirium. Boils  
are frequently followed by others  
low down. Sometimes three of  
these occur in succession each  
one requiring lancing in turn.  
Now it so happens that  
this trouble appears each year  
about July and continues  
through August. During this same  
period the jack rabbits become  
infected in some way so that  
they are lethargic, and bawly

Keep out of the way. Many of them die. It is the common belief that the flies bite the dead rabbits and then communicate this infection or an infection to man. There is no ground for connecting the two & except that they occur & synchronously and that flies are seen on dead rabbits. Six rabbits were reported seen yesterday by Dave Hewlett. He told of seeing one dead one with holes bitten in its ear.

July 14 I saw one. William White said I was suffering from the trouble. Several cases have occurred this year. Animals other than man (i.e., horses, cattle etc.) are not known to be affected.

August 2, Monday.

This morning was up at seven. Cool and pleasant last night so that I got a good nights rest. About nine went out with Mr. Ryan and Mr. Ferry to the Salt Creek marsh. About 12 miles northward of Corvair. Save for little mountain the valley is level through here and is almost all under cultivation. Water for irrigation comes from the Bear River canal. Wheat and other grain

and alfalfa are the main crops.

We passed the north base of Little Mountain and found the marsh lying in a small valley at the northwest corner. After going in we passed near the Salad River. This is a very narrow stream that has cut for itself a deep narrow bed in the level of the valley. The stream is sunk entirely from sight. No trees were left and from a short distance the presence of the river would not be suspected in looking across the valley.

Arriving at the marsh I spent a few minutes in a small knoll an outlying spur of Little Mountain while waiting for a man to bring me a pair of boots. Some sage grew on this eminence and much Atriplex confertifolia.

From this hill the height of 60 or 70 feet I could see down the Indian valley. Salt Creek rises from a series of springs at the base of the mountains to the south. One of these springs is fresh and the other brackish.



For four or five miles it flows  
down as a narrow  
stream and then reaching  
the valley level spreads  
~~out~~ as a marshy lake.  
This is perhaps 2 miles long  
in greatest extent at present by  
not more wide. ~~It has~~  
Passing this salt creek  
becomes a stream again  
and passing ~~at~~ the Sweet  
point of Little Thompson  
flows down toward the lake.

The Bear River Canal flows  
around this valley and  
drainage from it ~~crosses~~  
flows into the marsh. This  
drainage was freshened the  
marsh and has permitted  
the growth of aquatic and  
marsh loving species that  
formerly found conditions here  
sustainable. Formerly great  
areas now given over to  
salt grass and dense  
growths of *Scyfus* were mere  
open barrens.

~~There is~~ I was told by  
Mr. Fred W. Peterson, Tremonton,  
Utah P. F. D. 2 who is in charge  
of this marsh that there  
is no chance of drainage  
into this marsh from  
the Malad River. And from

observing the deep cut  
channel of the Malad I  
can see no chance of water  
from that stream reaching  
this marsh even in maximum  
high water.

A week or ten days ago  
water from this Salt Creek  
Marsh was turned into the  
Mill Canal controlled by the  
Bear River Club and so thrown  
into North Bay. This has lowered  
the water in the marsh  
a great deal and one large  
part of it to the west has  
gone entirely dry. Four days  
ago Mr. Peterson found  
about 30 dead ducks and  
four or five sick ones.

Sick birds have not been  
known here before save that  
in 1913 when shooting was  
resorted to to drive the birds  
from the Bear River marsh  
to the south a few came up  
here and a few sick ones  
were noted.

The stream of Salt Creek  
and its water in the  
marsh I found distinctly  
saline to the taste. The bed  
of Salt Creek was in clay  
which in some places had  
~~remained~~ ~~not~~ become indurated

from deposits from the water;  
crossing a hay field  
I crossed a dense growth  
of *Scirpus* (specimen) four  
feet tall. This is a species  
that I have not seen before.  
A small amount of *Scirpus*  
*paludosus* was noted.  
A *potamogeton* was abundant  
in the open water, forming  
dense growths with an  
algae on the surface.

The mud in bottom was  
a loose silts 6 inches deep  
yellowish greyish or brownish  
in color giving off a  
strong odor of  $H_2S$ .  
No black silt deposits were  
noted.

I found the marsh in the  
main about knee deep. a  
broad channel led through the  
center. In crossing this  
I stepped into a chuck hole  
and filled my boots.

Muskrat houses were abundant.  
A species of *Rana* was common  
and open water swarmed with  
larvixids.

I had from 10:30  
until two o'clock to  
work here and worked the  
lower two thirds of the  
marsh thoroughly.

The following affected birds  
etc were noted All but a  
few were dead.

Night Heron	1
Coot	1
Gadwall	1
Mallard	7
Redhead	4
Stilt	2
Yellowhead	1
Total	<hr/> 17

Muskrat 6 dead.

Post mortems on several birds  
following in separate sheets.  
These birds had an affection  
similar to that on Bear River.  
My first thought was that  
affection might have taken  
place in the drying part  
of the marsh above but birds  
probably young Redheads were  
noted that I was unable to  
fly limiting their activity in  
all ~~the~~ probability to the  
marsh in which they were found.  
Practically all of the birds  
were found near the centre of  
the marsh near the channel.  
Growth of S cyprus & a grass  
formed islands here and  
birds lay at the edge of  
these on muskrat houses  
or in the water near by.  
None were found in the

at the border of the marsh  
Six dead muskrats were  
observed in a short distance.  
With ~~some~~ so many present  
this death may (with  
some probability) be charged  
to alkaline poisoning. A post  
mortem of one revealed little.

On June Redhead and  
me still found the kidney  
affected as it was in the  
Mallard killed with My C<sub>2</sub>.

It was very hot on the  
marsh and returning to the  
cave at 2 o'clock I was  
glad of a drink and a  
slight lunch.

heaving here 1 1/2. Ferry  
Grove to the top of Little  
Mountain. A small canyon  
on the north side made  
passage possible by a narrow  
winding road. We crossed  
two old lake beaches just  
below the top one of them about  
70 feet above the other. At  
the top of the mountain  
was a hollow containing  
about 100 acres that in to  
grain.

Little Mountain was covered  
with sage brush 12 to 18 inches  
tall with a scattered growth  
of low chrysothamnus some of

which was just coming into  
flower. A low growing *Phlox*  
was seen also, with a few  
shrubs of *Crataegus*. On the  
highest part of the mountains  
were a few cedars. I saw a  
few scattered plants of *Berberis*.  
There had been ~~some~~  
no house here at the time. There  
was no water.

From the summit I had  
a fine view of the valley  
though it was much  
obscured by haze. Could make  
out the Duck Club readily  
as well as the ranch  
house at the foot of the  
mountain. To the north had  
been dug to a depth of 8 or 10  
feet. The water was very  
salt and though thirsty I  
drank little.

Orthoptera were very  
abundant in the sage as  
was a fly. Dragonflies were  
abundant and I don't doubt  
feeding on the cattle.

One superficial Duck was  
found in the marsh.

I took a water sample  
near the center of Salt Creek  
marsh and another from Salt Creek.  
Reached Corinne at 7:30.

August 3, Tuesday.

A fine cool night last night.

Had trip expense - vouchers witnessed in Corinne this morning. July expense was \$150.39, the other was a reimbursement account for \$4.85

Left Corinne at 8:45 had nearly an hour's wait at Brigham and reached Ogden at 11<sup>00</sup>. Much fresh greenery along the track from Corinne.

A large class red cherry was still on the market at Brigham.

At Ogden I bought some 4 foot inch mesh wire for another large pen and ordered it sent to Corinne by express. This I cannot purchase in Corinne.

Went to the Ogden State Bank, made a deposit and talked for half an hour with him.

Had a number of small purchases many of the officials make and this occupied much of the afternoon. After completing these

I wrote up the mass of notes secured yesterday.

Very hot wet day.

On the evening Mr. Bigelow took me up Ogden Canyon in his car. We had dinner and spent the evening at Miss Kiesel's cabin. I met Mr. & Mrs. Kiesel (Miss Kiesel's parents) also Mr. Dumphreys and Miss Rick.

It is very cool and pleasant up here. The main objection that I have is that the canyon is narrow ~~and~~ so that I have a feeling of being shut in.

Oliver backed Thrushes were calling in the evening.

Mrs. Bigelow has been very ill but now I is able to be up and about.

Returned to Ogden at 11 and retired about 12:30.

August 4, Wednesday

It was ~~so~~ hot last night. ~~That~~ I was able to sleep but did not feel refreshed upon awaking. Arose at 6:00 had breakfast and caught the 8 o'clock electric car for Salt Lake City arriving at 4:00.

Went to Schramm-Johnson's first and had an error in my July bill straightened out and ordered a few chemicals. Then to the Mine



and I melted supply Co for a few  
laboratory supplies.

Called on Mr. M. Cornick. He  
told me that the marsh at  
the New State gun club ~~was~~  
drained. He told me  
that it spoiled the fall  
shooting as it killed out the  
fowl. Other men have told me  
the same thing. I tell others  
say that it makes no difference.  
Be that as it may I can  
see no other way to avoid a  
mortality on this marsh. Mr.  
Cornick said that he was  
going to start an agitation toward  
gathering sick birds and placing  
them in fresh water that they  
might recover.

Talked with Mr. Chambus for  
an hour. He said that he  
had seen two or three sick  
ducks and a few dead ones  
in a small run near Selina.  
Just above them was a small  
alkaline pool. This was drained  
and the trouble ceased.

For a few days trouble  
threatened the New State gun  
club. The marsh had been drained  
save for one small lake. Above  
75 birds died on this but  
finally it was drained. The

marsh there was entirely dry now.

Some trouble was reported from ponds near Kapis and Clear Lake. Chambers was going to investigate this tomorrow.

A railroad man, Mr. W. G. Triplett, had reported about 75 Gulls apparently in a helpless condition <sup>in</sup> a pool on the alkali flats 4 miles west of Lucin. This pool was formed by waste water from the water tank. There was some uncertainty as to whether these birds had been sick or not. This m.w.

Triplett was in Ogden. Mr. Chambers asked me to give him some advice as to a topic for a paper to be read before a game wardens convention in San Francisco. I suggested something on the introduction of elk into the state, or the raising of trout for ~~common~~ the table. But finally said that I believed that the best thing would be a paper on "Shall we prohibit the sale of wild game birds or not?" Discussion to take the form of a description of the manner in which the sportsmen at the Bear River Club hunted ducks the numbers killed and the manner of

their disposal on the market.  
It is without doubt the fact  
that ducks can be sold that  
causes the constant violation during  
good flights of birds. If these  
ducks could not be marketed  
they would not be shot. For  
any true sportsman it is a  
paltry matter, ~~to~~ to obtain a  
few cents for what birds he  
can kill. As sport the chase  
of the birds, the outing, the  
fresh air should be considered  
sufficient return for the expense.  
enjoyed.

Ordered this coplin staining  
jars from Durbin Dental & Surgical  
Supply Company. Also 100 Cabels.  
Went to a dentist at three  
and found that a tooth from  
which a filling and one deep had  
been broken had to be crowned.  
Fortunately the nerve had been  
removed. This work required until  
7:30 and cost me ~~about~~ \$10.00.

Returned to Ogden leaving Salt  
Lake at 8:00 and reaching Ogden at  
9:00. Had dinner about 10  
and retired at 12:30.

It was very hot in my  
room and in fact was intensely  
hot all day. The radiation from  
the footstalls makes it warmer  
than it does at the

laboratory in the center of the  
flats.

August 3, Thursday.

Rose this morning at 6<sup>10</sup>.  
At breakfast did some writing  
and left for Corinne at 9:20.

Chickies at Brigham have just  
about disappeared. Reached Corinne  
at 10:27. There is absolutely no  
snow at all on the mountains  
here and I learned from Mr.  
Harry Fitch that the small  
streams in the mountains are  
very low. He had been across  
into Wyoming for the glucking  
shooting. He reported great  
numbers of green winged teal  
on all of the streams through  
the mountains.

At Corinne I bought two  
bundles of laths, 7 pieces  $1 \times 4 \times 12$   
and 3 pieces  $2 \times 4 \times 12$  of B. M. Shaw  
These were charged.

Purchased 2 lb. commercial, 5 gallons  
gasoline, a gallon of polaris oil,  
2 lb shingle nails, 6 cloot hooks,  
and 3 12 quart galvanized pails.  
Also paid for 300 lbs of  
grain to consist of wheat & barley  
mixed. This cost me 174 cents &  
pounds. 110 lbs went down the  
river Sunday with Bosley  
This makes an excellent  
duck food.

Bosley came up with the launch and we had the supplies transferred to the river and left at 1:00 for Duckville reaching that place at 3:45.

It was intensely hot though during the first part of the journey we had a strong breeze. There were a good many young Redheads on the river but not much else.

Water is being pumped from the river to fill the Cheapeake Bay.

At Duckville we had something to eat and then proceeded to take care of the supplies brought down.

Went down No 1 trying to capture some young Redheads but lost them. I found a male mallard that had just died.

Bosley promised to paint the laboratory during my absence but did a rotten job so that it may have to be done over. I furnished the paint presumably. The building is a dark grey with frieze boards and windows moulding white. In the evening I called on Mr. W. A. Neal who is at

Bear Pion Club discussing some plumbing.

A good cool breeze came up in the evening. The carp was gotten away with my pole in the river during Ed. Tuberson's. One thing I would have dug out at the end pointed there is a hole under it a few deep.

Water levels during the past few days are taken by Bosby as follows.

August	2	3ft 1 in.
"	3	3ft 0 in.
"	4	3ft 1 in.
"	5	3ft 3 in.

I have an idea that these are not very accurate. He had made two mistakes in entering them. [Water these

August 6, Friday.

Water gauge at 7:00 a.m. 3ft 2 1/2 inches. Intensely hot all day long. A storm threatened toward evening and a heavy rain passed from Corinne south along the foothills. Another crossed south of us from Promontory Point to Willard.

All worked at the laboratory for day. Arranged platform pens and placed sid experiments and placed

birds in them. These pens  
have the platform covered with  
river sand which is patted  
down to make it smooth  
otherwise it is very hard on  
the ducks' feet. The top of  
the pens are covered with  
bushy. Two layers of these  
are put on. One layer has  
the heavy butt ends of the  
stalks over with one edge  
of the pen, while the tips  
project three or four feet beyond  
the other side. The second  
layer has the tips projecting  
on the opposite side. Two  
willows as long as the  
pen and 1 to 2 inches through  
are cut. These are lashed by  
wire to the top of the pen at  
the back with wire and then  
drawn down and lashed in  
front. These hold the rushes  
in place and prevent their  
being blown off by the wind.  
They leave off the pens in  
birds in the pens for 24 hours  
giving them river water and  
food in order to accustom  
them to using the pens.  
Various solutions are then  
introduced.

Borrowed a wheel barrow  
from the Bear River Club. This

Morning.

As the evening it was very cool and pleasant.

There was quite a flight of Pintails and Mallards down the river this morning continuing until 11:00 o'clock.

Trails, Flycatchers were returned and I heard Black-bellied Plover passing over.

Mosquitoes are not at all bad now even at Sacketts.

Blow this one very abnundant.

Visited Sacketts in the evening.

August 7, Saturday.

Water gauge at 7:00 a.m.

3ft  $3\frac{3}{4}$  inches. Very hot all

day today. Toward evening

a violent wind storm blew

a cloud of dust up along

the foothills obscuring the

mountains... at dusk the

floating particles of dust made

a beautiful red sunset. The

glow extended for miles along

the Promontory Range.

Albis returning to the rookeries

were hard put as they had

to fly at right angles to the

wind.

It was necessary to move

the large fresh water No 1 & 6



as the carp had dug away  
under them badly. Under the  
end of one pen water was  
nearly hip deep. A split in  
the <sup>dam</sup> ~~river~~ allowed large  
carp to enter the pen. On  
checking up my bands I found  
that I had three more  
Redheads than the records showed.  
They must have come in  
through the hole in the bottom.  
There are several outside  
trying to get in every day.  
The pens were entirely  
surrounded by racks of lath  
18 inches long the carp  
out.

A mallard died today  
from lead poisoning. Notes on it  
follow.

About this I went out  
Channel 3. There were great  
numbers of ducks out on the  
flats but no sick ones were  
encountered. Thus far the water  
has been going down with  
only slight oscillations. I  
found on the portion of the  
flats here that had been made  
long early in alkaline crust  
similar to that on the flats  
in front of the laboratory. In  
lower levels the encrustation  
was forming at the borders

of cracks while the mud  
between the cracks was still  
kept moist. In these places  
however the surface mud  
had a strong saline taste.

August 8, Sunday.

Water gauge at 7:00 A.M. 3 ft 5 1/4 in.

It was intensely hot all day with a south wind that blew the smoke to the north and obscured everything south of Promontory Point.

I put in most of the day at the laboratory attending to the experiments now in progress.

Two Redheads given Peter's alkali scale show every symptom of the malady.

(Afternoon) a Mr. Hoffman and a Miss Wallberg (name?) drove down from Brigham. They come from the forest service in Ogden. They were interested in birds and knew a little regarding them. The lady wished to see some pelicans so I took them down 3 1/2.

The water was very shallow and I was able to get down only as far as the small island and scaped on bottom for a long way at that. The boat does not do nearly so well since the propeller blades have been straightened. Mr. Neal came down for the evening.

There were great numbers of Mallard and Pintail in South Bay. In fact the whole state

were covered as far as I could see.

~~Water evaporation is~~

From 1886 to 1905 the lake level according to the blue print in my possession has been steadily falling. In 1886 <sup>June</sup> the water stood at 11.5 ft. above the zero of the middle quag. At the lowest point in 1905 the water level was about  $-2.3$  ft. a drop of 13.8 ft. In <sup>late</sup> 1900 the water stood at +4 ft but from then on the drop was rapid. The water level shown for June 1914 is +5.6 or a rise of 7.9 ft in nine years.

~~This rise is in the~~ The water level varies during each year from 8 inches to 3 feet or more. Usually it rises until the middle of the year apparently about June though currents are not indicated and then falls until the end of the year when it begins to rise again. Since 1909 the water has remained at approximately the same level varying 1 ft to 1.5 feet each year.

The great rise in the lake level since 1905 would cause considerable difference in the height of the ground water table and also much difference in the drainage of the flats in the

mouths of the river to  
eastern border. In the low  
areas along the lake shore this  
rise in ground would cause a  
corresponding rise in the saline  
held in solution.

Water evaporation from a fixed  
surface at Soole south of the  
lake is <sup>in</sup> as twice as much  
during June, July and August as it  
is during April and October.

This would cause <sup>the</sup> greater evaporation  
on the mudflats from the time  
that is slackening of the water  
supply began to lay them dry  
and this evaporation would  
increase until August. The water  
level is <sup>unusually</sup> low because  
of the amount drawn out for  
irrigation and a failing supply  
due to small amount grain  
and the low state reached at  
that season by the snow on  
the mountains. This constant  
evaporation would ~~dry the~~ tend to  
evaporate the ground water, and  
to concentrate the alkali salts  
held in solution <sup>at</sup> the surface.  
In many places where evaporation  
was great enough alkali crusts  
would form and the higher  
ground (sails) at the surface  
evaporated <sup>causing</sup> attraction  
would draw more to the

surface to be evaporated in its  
turn. ~~Even when~~ - In some  
places the lay of the land  
might be such that the  
alkali crusts would not be  
blown out sufficiently to be  
visibly evident: in spite of this  
the surface might ~~be~~ ~~the~~ ~~plate~~  
would be found saturated with  
the alkali. This would be the  
case ~~at the~~ on ~~mountain~~  
elevated ~~in~~ ~~as~~ ~~is~~ ~~shown~~  
the water level when the  
ground water is practically at the  
surface. Now let the water  
be blown out over this surface  
by the wind and these salts  
would be immediately taken into  
solution. In a narrow skin  
of water such as would  
spread over these mud at first  
solution would be highly  
concentrated especially ~~around~~  
this be true right at the advancing  
edge of this water. Again rain  
might form pools ~~between~~ in  
slight depressions causing  
concentrations. Birds following  
eagerly along this advancing  
water to feed on the seeds of  
Potamogeton floating up in it and  
the original bottles struggling in  
the water would obtain quantities  
of the salt. The water

of the bags already contains  
them in solution and the birds  
have been absorbing them into  
their systems. With the weight of  
load they are unable to throw  
it off and succumb, transferred  
to water that is rich and  
they recover.

August 9, Monday.

Water gauged at 7:00 A.M.  
3 ft 6 1/4 inches. The current in the  
river was almost dead and  
the water quite salt to the taste.  
During early forenoon the sky was  
overcast but later the sun  
came out and it was intensely  
hot. The mornings now are cool.

Except for a few scattered branches  
down near now disappeared from  
the willows. No down is now  
seen floating on the river surface.  
Formerly it was abundant.

Because a current of water  
was flowing into the mouth of  
Boggs' overflow toward the river  
but in 500 yards the water  
became dead. The water coming  
in from the bay was quite saline.

There is more than double  
the area of water on north bay  
now than there was at the time  
of my former visit. This comes  
from the canal supported by the  
Bear River Club.

In the open flats here I found that the mud first laid bare was now covered with a white alkaline crust. I made a profile here getting the elevations and distances from the edge of the overflow. I found that the highest point was 18 inches above the present water mark. The highest level consisted of a broad flat slightly higher ~~at~~ toward the overflow. It has a crust formed  $\frac{1}{16}$  inch thick at least. With the shoulder blade of a steer I scraped up 5 pints of this material and took it back with me. Below this toward the overflow was another bench covered with a crust in formation. The soil was still damp. The mud was very bitter as well as saline apparently with  $\text{CaCl}_2$ . Another bench below this was slightly saline and below ( $6\frac{1}{2}$  to 75 ft!) the mud had been newly laid bare.

Now on June 4, 1915 using levels obtained from my water gauge at the laboratory the ground would have been two inches above the highest point indicated on this profile. I can recall when this point was laid bare and when the mud was as fresh as that now newly uncovered at the



edge of the overflow. The portion covered with alkali was laid bare about June 17 and has not since been covered. During the steady evaporation since water has been given up leaving salts held in solution behind. At the same time capillarity has drawn up ~~fresh~~ other water from below to be evaporated in its turn.

It should be determined how deep this capillarity operates. J. Young, Bul. 61 U.S. D. A., Potash Salts & other salines in Great Basin Region. p. 26.

The second bench (38-53) has been bare (again using laboratory water gauge levels) since June 22 with the exception of the period July 10 to 13 when it overflowed. I verify these figures.

Now it is evident to me that when the water level raises above these two benches that there will be poison laid open to ducks in their feeding. The probabilities are that lower levels may have the alkali salts in them raised by that and be in themselves dangerous to bird life.

In judging on these newly flooded surfaces the birds get strong concentrations of

alkali salts. As noted before with  
water rising slowly on these  
level surfaces either through  
actual increase of water supply  
or through the action of wind  
the extreme water edge where  
the incoming stream is very  
shallow  $\frac{1}{4}$  to  $\frac{1}{8}$  inch perhaps the  
concentration must be great.  
With slight ripples the mixing  
of the salts would be increased  
and the solution rendered  
much stronger. (again in feeding  
here the birds gather some  
or less of the top surface off  
it through the bill and swallow  
it. This would increase the  
Before an amount of poison taken  
into the system. Before me I  
have a porcelain dish contains  
about 15 cc of water & perhaps  
120 milligrams of crust from  
this locality. After standing  
minutes without mixing the  
water was strongly saline.  
At the same time a bit of  
must about partially on a hotter  
was also very strongly saline.  
Thus proving this statement.  
290 milligrammes of crust dissolved  
in 5 c.c. of water giving a very  
strong solution. In both these  
a sum of bubbles appeared on  
the surface as the water took



on the solution. This is a common appearance when the water is rising and flooding new areas.

Again as the water spreads over new ground it frequently runs out in cracks, far ahead of the actual water edge. In these concentrations of salts are great and birds feeding through them would likewise secure the soft deliquescent crust on either side. Crusts <sup>usually</sup> form first along cracks when such are present.

Aug 10, Tuesday.

Water gauge at 7:00 A.M.  
3 ft. 6  $\frac{3}{4}$  inches. Intensity not again today. The club house is running short of drinking water too.

Went out 3  $\frac{1}{2}$  about 10 accompanied by Fred Hansen who wished to set some traps for pelicans. We were joined by the leave the launch just below the Healy canal and found that the overflow is treated as a channel clear to Mud Point. Below this was some water. Thousands of mallards & Pintails were gathered in here. I caught two sick Mallards.

Most of the Western Sandpipers  
have vanished but I saw a  
number of Baird Sandpipers.

The Carps have been digging  
around my duck pens again  
and ~~the~~ had to be ~~set~~ up  
and filled in. They had dug  
under the end and two Peckhacks  
had forced through the wire  
gone under the pen and  
been drowned.

August 11, Wednesday.

Water gauge at 7.00 A.M.

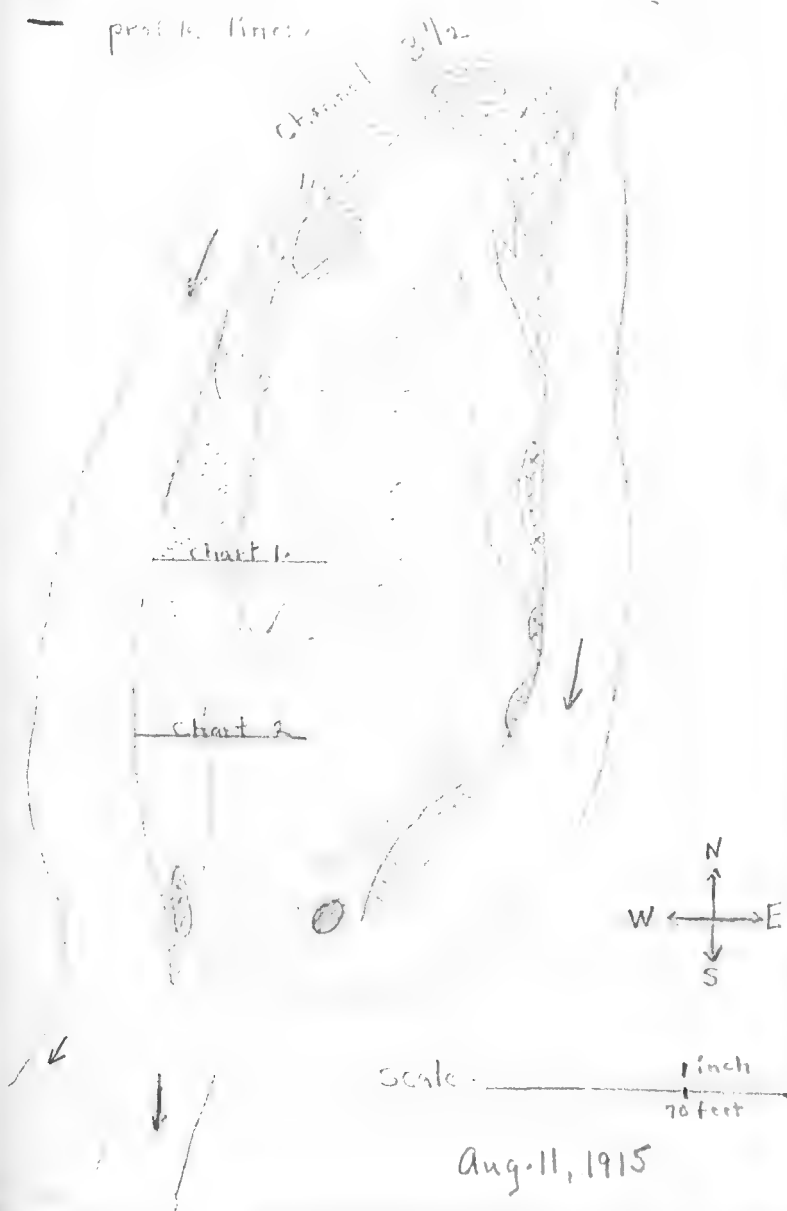
3 ft.  $7\frac{1}{4}$  inches. Alt. is cool and  
pleasant during the night here  
and I sleep very well. It  
was not so warm today as  
it has been.

Current is almost absent in  
the river now. Practically no water  
is going out the Huey canal  
and in the launch I was  
able to go down only as far  
as the cross channel from 3 to  
 $3\frac{1}{2}$ . The launch scraped in  
entering  $3\frac{1}{2}$  above Sackets.

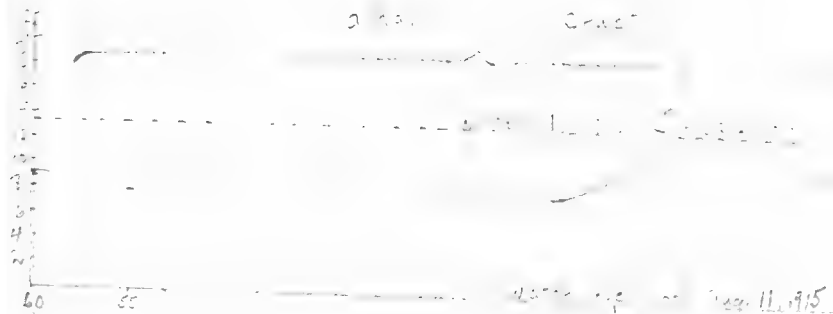
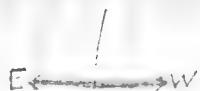
In going down  $3\frac{1}{2}$  I  
landed on a small island  
and studied the alkali  
conditions. A chart of the  
island is given. It will  
be seen that alkali  
effluences have formed on a

Diagram of Island 3 1/2.

- alkali surface cover.
- ▤ surface stilldamp. strongly saline.
- ▥ growth of foxtail grass.
- ▧ bulrushes
- profile lines.



Aug. 11, 1915



the region  
Varying from dry  
to moist, no crack

Heavy  
sandy clay / low water  
old shoreline

Measurements only for  
the area

1000 1000 1000 1000

3 - Water level 3 feet above ground level  
13 - Water level 2 feet above ground level  
Sample 1000 1000 1000 1000  
Chart 2

1000 1000 1000 1000

20  
18  
16  
14  
12  
10  
8  
6  
4  
2  
0

Damp  
about  
at

at

at

Damp

Very

Somewhat dry

a few

are

Note  
36

W

A note about the water level in the well at the station is as follows:  
100

Some care was taken to observe the water level in the well at the station.



little less than  $\frac{1}{2}$  of the entire area of the island. In an equal area lying a trifle lower in elevation the surface is still damp. Alkalis have raised rapidly here however through surface evaporation and this is great concentration of the salts here immediately at the surface. In fact this concentration must be nearly as great as that mentioned above. All that is necessary is for enough moisture to be given up to form the crust. The remaining area perhaps  $\frac{1}{8}$  of the entire island is ~~now~~ grown with forest and brush. Now a rise of twenty inches in the water level will inundate this entire island and immediately the soluble salts will be offered in concentration by such water as choose to find here at this time.

Two profiles were made here on lines indicated on the chart. Using water levels taken at the laboratory it is found that ~~judged on~~ this basis ~~this~~ ~~region~~ the portion of this region covered by alkali efflorescence has been bare since June 22. It remains now to establish a ratio between the rise and fall

The water here and at  
the laboratory. The strip ~~find~~  
bank from 7 to 8 feet from the  
present water of the overflow  
has been a shore line for  
some time. It is composed  
mainly of clean sandy  
clay from which ~~the~~ the  
surface of which most of the  
soluble salts have been leached  
by the constantly passing water.  
Thus far the trend of  
the water level has been almost  
constantly downward. This has  
increased the areas exposed  
to evaporation but at the same  
time has not thrown the  
soluble matter contained in their  
surfaces again into solution.  
Though the salts in solution in  
the river have increased  
still they are innocuous to  
bird life as witnessed by the  
fact that my captured birds  
continue to thrive. This constant  
downward trend of the water  
level will explain the small  
number of sick birds found  
as yet.

Proceeding down the  
overflow I found that  $3\frac{1}{2}$   
extended as a channel to  
a point on a line with  
Bigelow & Mud Points. Here it

began to spread out. For  
more than half a mile here  
were great areas of changing  
mud on the higher parts, notably  
those between the banks  
of the creek. It seemed that  
alkali effluence was being  
indicating the great concentration  
of salts in the surface of the  
these salts were present in the  
last isolated clumps of water  
down the bank.

A box full of scales was  
gathered on the island shown  
in the diagram and brought  
in to the laboratory.

Aug 22, Thursday.

Water gauge at 7.00 a.m.  
3 ft. 7 7/8 inches. Very hot again  
today. Today I spent practically  
the entire day in studying  
birds dead in my experiment pens.  
Received mail and supplies from  
Corinne last night.

Two more bundles of lath were  
brought down and I had Bosley  
make them into racks of full  
length lath. With these we  
built as fence three fences outside  
our pens so that the carp  
cannot get at them. The ends  
of the pens had been dug  
under and were all filled  
in good shape. Called on Mal

is this evening at the Bear  
River Club. He gave me the  
clipping that I have on the  
next page. Evidently my visitors  
of last Sunday were good  
press agents.

~~Twenty~~ young Redheads were  
captured during the day and  
placed in the pens. They come  
into the racks surrounding the  
pens and are unable to get  
out.

There is quite a flight of  
Mallards and Pintails down  
the river every morning.  
I think that the birds are  
coming from the east end of  
North Bay and perhaps  
from the Chesapeake. The flight  
continues until about eleven.  
During the evening I hear them  
also going up stream. Many  
are doubtless feeding in the  
grainfields. Heading the grain  
has been going on since Aug. 1.  
Yesterday a big fire started  
on the west side of the Promontory  
range and made a great volume  
of smoke. Today farmers on the  
eastern slope were back firing in  
order to save their grain fields.

# DUCK MALADY DUE TO ALKALI, FORESTERS SAY

Ogden Examiner Aug. 10, 1915

Advance Theories on Disease  
Being Analyzed by Dr.  
Alex Whetmore at  
Duckville.

WATERFOWL ABUNDANT  
NORTH END OF LAKE

Scientist Experimenting With  
Inoculated Birds in Effort  
to Find Cure.

The theory that the duck disease which affects the ducks on Great Salt Lake each year might be due to the alkaline properties of the water near the shore where the ducks feed was expressed yesterday by Miss Rosalie Holberg of the forest service, who with Irving N. Hoffman, also of the service, made a trip to the federal experiment station conducted at Duckville by Dr. Alex Whetmore, on Sunday. Miss Holberg and Mr. Hoffman went from Brigham City to the lake and were taken by Dr. Whetmore for some distance down the channel of Bear river into the lake in his launch to study conditions of the water fowl.

Dr. Whetmore, who is an assistant biologist of the United States biological survey, showed his visitors pieces of the flesh of ducks which had died this season and stated that the meat was in a soapy state. This indicated, he said, that alkali was in the flesh as animal oils and alkali form soap. Dr. Whetmore has several live ducks which he has inoculated with disease germs and they are in practically the same condition as the ducks affected by the malady which they had contracted themselves. He is studying the duck disease with a view to determining the cause and has made quite extensive experiments along this line.

The disease will affect the water fowl to a considerable extent this year, the scientist informed the Ogden people, and has commenced to develop to a slight extent already. Several ducks were seen which were affected by it and some which had died were also noticed.

Miss Holberg said that the section visited was fairly teeming with water fowl of all kinds. Sixteen separate varieties were seen, including Canadian geese, cormorants, teal, red heads, canvas back, pelicans, blue and white herons, glossy ibis, avocets, killdeer and many other snipe and larger species. In several places nests made by some of the smaller birds were seen which had been built up tier by tier for a distance of over a foot to keep the nests above the constantly rising water. The lake at this time of year, however, Miss Holberg said, was unusually low and water which had filled small inlets and marshes along the banks a few weeks ago had receded to the main lake, leaving bare stretches of alkali plains reaching for miles.

Dr. Whetmore has been investigating the duck malady for some time and has written a comprehensive report of the work which has been accomplished. He has been at his present location since early spring.

August 13, Friday.

Water gauge at 7:00 a.m. 3 ft. 7 <sup>3</sup>/<sub>4</sub> inches. Very hot, again today. This morning I wrote to R. N. Palmer of Pocahontas, and for information regarding conditions among the ducks on the Potomac reservation at Marshfield. This letter was taken up early by John Davenport who hauled the load of carp up from the Bear River Club. These carps are taken to Jim Hull at Brigham for use in his fish hatchery.

Today I moved the water gauge from the wharf and placed it on a pile supporting the bridge at the laboratory. For there is a little danger of shifting through, bending from the bottom. I have made a sand mark at the zero on the gauge, by cutting it into the pile support, so that if it should rise the water gauge next season could be placed in the same place without it. The result obtained on the tube is not so comparable. The gauge is on the west side of the pile on the east bank of the river.

The day was spent in making dissections and

studying the effect of  
 experiments.  
 At present I am feeding  
 16 birds of each of  
 Redhead, Green-winged teal, and  
 Mallard. I have about 100  
 lbs of mixed grain in  
 Cornish but wish to keep a  
 supply on hand. Mr. Lewis  
 quoted me Barley at \$1.00 per 100  
 and wheat at \$.85 per bushel.

Redhead	69
Green-winged teal	5
Mallard	9
Green-winged teal	7
Cinnamon "	2
Mallard	8
	100

There may be variation here  
 of one or two birds but not  
 enough to make any practical  
 difference. The great bulk  
 of these being young Redheads  
 they require more food. One  
 that I killed today had  
 gizzard and throat expanded.  
 This evening I ordered  
 100 lbs of Barley and 100 lbs of  
 wheat from W. F. Davis. I still  
 have 100 lbs of mixed grain in  
 Cornish but wish to keep a  
 supply on hand. Mr. Lewis  
 quoted me Barley at \$1.00 per 100  
 and wheat at \$.85 per bushel.

August 14 Saturday.

Water gauge at 7:00 a.m.  $3\frac{1}{2}7\frac{3}{4}$  in.  
Cool and pleasant all day  
with a strong breeze from the  
southwest.

This morning we went up  
the river and the lumber  
and then out Brown's overflow  
in a rowboat. The water  
was very low in the overflow  
and in several places the  
boat scraped so that we  
could barely pull on.

A dead Mallard, 1 stub  
and a muskrat were seen.  
Graham Davenport who followed  
us down captured a two thirds  
grown mallard that was  
fair and gave it to me. In  
addition I found a Mallard  
Drake dead from eating shot.  
A post marked on it follows.

I found that the water  
in the bay which still has  
gone down at least an  
inch and perhaps more.  
Great numbers of Mallards,  
Pintails and green-winged teal  
were present in the bay. I  
could see west as far as  
mallard point. How much further  
down the water extended  
I could not say.  
I set a small water



gauge at the mouth of the  
overflow. By getting occasional  
readings on this I can  
correlate the rise and fall  
here with that of the river  
at the laboratory. The gauge  
was set with the water  
level at 3 inches. The zero  
of this gauge is at low water  
not at high as on the  
gauge at the laboratory.  
I found that on the  
plate here that alkali was  
is raising rapidly on areas  
not more than six inches above  
the present water level. At the  
places at the edge of  
the overflow the alkaline  
efflorescence was raising as  
a light fluffy mass singular  
in texture to the alkali  
deposit noted on the south  
shore of Sulphur Lake in California.  
An island of bar off  
the mouth of Brown's overflow  
300 yards or so had a  
large amount of white  
alkali showing on it.  
A powder box full of the  
scale was gathered at the  
mouth of the overflow. The  
efflorescence is not so thick  
here as I have seen it  
in other localities. The surface

Soil was roughened by  
bird tracks too, much when  
the mud was first exposed.  
~~And~~ For this season more  
mud & earth was scraped  
up than is the case in  
gatherings made at the  
Laboratory and at the mouth  
of 3 1/2.

There is considerable food  
in the water of seeds & insects  
held by this alkaline  
efflorescence and it is  
unquestionably this that  
attracts the birds when the  
surface is flooded.

The few Magpies found  
affected may have secured  
the poison through picking  
up insects imbedded in  
the alkali or by picking  
off the dried flesh of dead  
chicks incrustated with it.  
Both these seem very young  
birds and young birds are  
not particularly as to their  
diet.

The gulls apparently are  
running land after a few die  
the others keep away from  
the shallows. Rumpulls are  
seen along the river now.  
Many of those that were  
not probed have

undoubtedly been seriously  
affected and they learn to  
avoid such things readily.  
The California gold that was  
used in experiment 23 rejected  
instantly as bit of meat that  
had fallen on the alkaline  
effluence in front of the  
laboratory. In a manner  
in which the specimens were  
poisoned in a manner to me  
yet unless it may be that  
the young birds - they drank  
quantities of the saline  
water of Bear River Bay. Or  
may have taken water from  
the lake itself.

The carp had dug away  
under one of the large out  
side racks at the duck pens  
and this was filled in with  
brush and then covered with  
mud. The fish after they get  
in seem anxious to get  
out and begin to dig  
on the inside of the racks  
without bothering its  
pens themselves. The fish force  
their way in between the racks.  
We have caught a dozen  
in a net and have thrown  
them out on shore and  
since that time has  
not been as much digging

The certain number of the  
fish have become accustomed  
to working Sunday the pens  
with these destroyed there  
will not be nearly so  
much work.

This evening I went  
up to the Bear River Club.  
I found that ~~the~~ the grain  
for me had been frozen.

August 15, Sunday.

Water Squage, got 7:00 a.m.

3 ft 8 inches. It was cool and pleasant all day. During the forenoon I had various orders and made a number of writing about the laboratory. Another 6x12 size of mesh wire was purchased this morning. I did not place it in the water as I have no catch to make. I had a man who was supposed to bring me down a bundle but failed to do so.

The cost of this pen made of mesh wire was as follows.

36 ft. 4 ft. inch mesh wire.	144 sq ft @ 1/4c.	1.88
48 .. 3 ft. .. ..	144 .. @ 1c	1.44
5 - 2x4 - 12 ft.	40 bd ft " 24 <sup>00</sup>	.46
5 1/2 - 1x4 - 12 ft.	22 .. " 29 <sup>00</sup>	.64
1 lb nails		.05
1 lb. Staples		.10
1 pr. hinges		.10
1 latch		.02

\$ 5.11

Made of 2 inch mesh wire the cost for wire would be \$2.16 making total cost \$4.03

Two prices are shown for mesh wire above. Dr. Aglen I paid 1 1/4 cents a foot and in some 1 cent. It is figured here at actual cost. The expense of this pen was really somewhat



present who came down  
 with a load of groceries  
 said that the supply for ducks  
 was poor last fall. so some  
 this I would think I indicate  
 few mistakes in shipping. local  
 market buyers were forced to  
 peddle their ducks from  
 house to house as I do to  
 dispose of them. so took to  
 me that the Linn County  
 Club had difficulty in selling  
 their birds.

At Sackets the following  
 prices were paid for the markets  
 winter birds which:

Mallards	at	\$1.25
Canada		.07

When the birds were shipped  
 they sold as follows:

Mallards	per dozen	\$1.50
Canada		1.00
Geese (w/ spec bills)		.90

Since prices agree with those  
 that I heard when I was last year.  
 When peddled from house to  
 house the birds sold as follows:

Mallards	per pair	\$1.50
"	common	.45
Geese		.30

In the morning I wrote to  
 the game commissioner of  
 Idaho requesting a permit





readily. The wind howled  
through them making a great  
noise so that we had  
the impression of a storm  
in progress much more terrible  
than the actual process.

With the first gusts I heard  
and fifty swallows that had  
been resting on the telephone  
wires came out into the flats  
in front of the laboratory and  
hovered just above the ground  
or settled in the short grass of  
Sahomig cutting. Occasionally a  
few rising higher up would  
be caught and whirled away;  
but then soon shot down  
just above the earth and  
returned. The larger proportion of  
these of course were going to  
the water. They were equal  
in making descents & starts  
of birds to in the experiment  
done.

On the evening I called on  
Mr. West at the Home for the  
It was my last evening.

August 17, Tuesday.

Water level at 7:00 A.M. 34.7 inches

This morning I went out  
channel 3 1/2. Just before this  
channel passes out into the  
flats I found a large alkali  
barren ground with efflorescence.  
This lies about 14 inches above  
the present water level.

Just below where the  
people were made I set a  
water gauge. At the side of  
the well it registered 3 inches.  
Polarization lens nearly all  
disappeared. We went today  
down nearly to Laughlin point  
without seeing any large  
amount.

The following sick birds  
were captured.

Gadwall "

Mallard "

Green-winged teal "

Coot "

Pelican "

California gull "

Two or three other pelicans  
were seen that were affected  
but no attempt was made to  
capture them. The two latter  
had the eye intensely irritated  
to which. This may have come  
through feeding in salt water

of the bay. These two Birds  
and the gulls were brought  
in and laid on the grass  
at the laboratory.

The few birds seen that  
were affected may have become  
so in water banked up by  
the high wind of yesterday.  
Except for the pelicans and  
gulls the affection was very  
slight.

Mallards have suddenly  
decreased in numbers here  
but Coots have suddenly  
appeared.

Beard Sandpipers, and a  
number of lesser yellowlegs were  
seen.

This afternoon at the  
laboratory I saw goldweed  
in bloom.

There is quite a noticeable  
movement of migration among  
small birds now mainly with the  
yellow warblers.

August 18 Wednesday.

Water gauge at 7:00 A.M. 3 ft. 7 1/2  
The river seems to be slowly  
rising. It was cool and  
pleasant nearly all day. I  
spent the day at the  
Laboratory watching experiments  
and making dissections.  
In the morning I walked  
up along the willows to my  
boom day fence and found  
quite a lot of goldenrod and  
a number of subflowers in  
bloom. I also saw migrants -  
saw a dozen or more  
yellow Warblers. Again after  
lunch I went up and  
collected a number of insects -  
in both goldenrod and  
subflowers. A small bee was  
common and I got one.  
In the morning I saw a peculiar  
red bug but it eluded me.  
Returning to the same plant at  
noon I succeeded in capturing  
it. It is peculiar, short heavy  
bodied, it was lost. Two  
Phymata sp. were captured. Shrips  
were found in both goldenrod  
and Helianthus.  
I had an invasion from  
some young people from Perry  
town today and lost an

little valuable time. John just  
 came then brought a water tub  
 along which I was not bad.  
 Before now it was very  
 3 1/2 gal for as the plumb caught  
 and looked in small amount  
 of water in it. The boat  
 scraped back in crossing  
 the bar at the head of  
 3 1/2 above & cutts.

This afternoon Mr. Davis  
 and one of them a sack of  
 Barley and one of wheat along  
 the evening I went up and  
 got them.

Barley	77 lbs	at 10	\$ .77
Wheat	100 "	\$ .85 per bu.	
		or \$1.42 per c.	1.42
			\$2.19

The grain was of good  
 quality. The cooks and I  
 seem to prefer the wheat but  
 the Redheads take any of it.  
 Went on up to the Bear River  
 Club and called on Mr. Neal  
 a scotch plumber Mr. Macmillan  
 sang some music for us and  
 another scotch song about the  
 vale of heaven. He told us  
 that the latter was a song  
 made up by the people of  
 that section concerning the  
 "van valley". The vale extends

from the Clyde up toward  
Rock Harbor and in a very  
beautiful spot. Mr. Maxwell  
has a wonderful voice and  
the singer will understand  
the sunset this evening  
was beautiful. Beyond the  
mountains was a deep  
red glow as of a huge  
fire which on this side  
the promontory range stood  
out a dark purple with  
not a streak of lighter  
color on this side of them.  
The red on the opposite  
side was confined to a  
narrow space immediately  
beyond the sun. Cook went to town today.

August 19, Thursday.  
Water gauge at 7:00 A.M.  
3 ft 6 1/2 inches. It was  
very hot today, and I  
found it inland by 20 in  
South Bay. The light was so  
strong I could not see that I  
was forced to put on dark  
glasses.

A small stream of water  
was running out ~~the~~ ~~the~~ Canal  
water gauge on 3 1/2 registered  
3 5/8 inches. This slight rise  
has made a great difference  
in the amount of water.

was able to run much  
further down with the launch  
than I have for some time.

& all are raising in  
profusion on the flats where  
there is only 4 or 5 inches elevation  
above present water level. Other  
mud a little lower must  
therefore contain considerable  
concentration. All this will  
be taken into solution later.

At the edge of a small  
channel I dug a hole in the  
mud with my hands. The  
mud at a depth of 12 inches  
yielded a considerable flow of  
saline water.

In considering the appetites  
of a bird on newly hatched  
tweens it must be borne in  
mind that a duck in feeding  
comes large areas. As the  
water comes up it floats  
little insects, seeds of *Potamogeton*  
and other food, washing it up  
in little windrows before the  
advancing edge of the water. It  
is these that attract the birds.  
Last year I noticed that nearly  
all the sick birds examined held  
seeds of *Potamogeton* in the stomach.  
These seeds lying in the scales  
may absorb considerable alkali.

and convey it into the  
stomach of the bird.  
Only the sick bird was  
found today in immaturity  
Mallard.



August 20, Friday.

Water gauge at 7:08 a.m. 3 ft. 1 1/8 inches. This rapid rise must indicate a break in any irrigation canal somewhere. It was cool and pleasant during the early morning but hot during the rest of the day. There was little breeze. During the afternoon I found it pleasant outside the laboratory in the shade. The thermometer every morning stands at about 65° F.

Sent Bosley in to Corning today for mail and some lumber that I need. I will build me more platforms for a pen.

Two experiments terminated this forenoon Nos 38 + 39. These give post mortem results very similar to those of sick birds and I begin to feel somewhat encouraged. + or - two or three days the outcome has seemed uncertain. I spent the entire day in working on these birds and writing & in study.

Bosley returned about 6:30. I found that I had quite a lot of mail.

Blythe (Poissons their effects &

detection) says that (p-127)  
the neutral salts of the alkalis  
are poisonous if administered  
in sufficient doses. The poisonous  
effect of the sulphate, chloride,  
bromide, iodide, tartrate and  
citrate appears to depend on  
the specific action of the alkali  
metal rather than on the acid or  
halogen in combination.

In studying the analyses  
of the sea & water from this  
region I find the ~~the~~ three  
following are the alkali metals  
present

Calcium

Magnesium

Sodium

These are arranged here in  
order of their abundance the least  
common being first.

Blythe continues by saying  
that common salt in such enormous  
quantities as half a pound to  
one pound has destroyed human  
life. He concludes however that  
the poisonous action of the  
sodium salts is of scientific rather  
than practical interest.

Here I may note that  
the species affected in the main  
are however fresh water haunting  
forms and as such are

unaccustomed to these salts.

It has been found that the action of the salts of sodium upon the blood is to color it a brighter red while the form of the corpuscles is changed; they become shrivelled through loss of water.

Potassium salts are said to leave the body through the kidneys but appear to be excreted much more slowly than the sodium salts.

In the analysis of fluid the following present.

Magnesian sulphate - Epsom salts  
Sodic sulphate - Glauber's salts.

The last named is present in large amount in the alkaline effluvia sample from Sulphur Lake.

In cases of rapid death by sodic salts they will it is said be found in such quantity in the stomach that there will probably be no difficulty in coming to a direct conclusion by analysis. This however would be of little value in a bird's stomach. This excretion is said to be very rapid.

August 21, Saturday.

Water gauge at 7:00 A.M.

ft. 2 <sup>1</sup>/<sub>4</sub> inches.

This morning I went out

Brown's overflow. Found that a current was setting out of Brown into the river indicating a drop in the latter. There were a good many carp in the overflow. The water gauge registered  $7\frac{3}{4}$  inches.

The raise in water has increased the moisture content of the drying soil of the flats so that much of the alkali crust has been moistened. On close scrutiny it is plainly visible however.

There were quite a large number of ducks on the bay, about as many as formerly I think.

On examining this area I find or seem to find a low area say of 5 inches in altitude in which the water may at present rise and fall safely. Above this is a danger zone.

This afternoon birds were placed in pen 12 for another experiment. Have terminated the experiments in progress but am retaining the present controls for a few days. The pens have all been prepared for ~~another~~ experiments but I will not start a new series as I will expect to go into details this week.

Along the edge of Brown's  
outflow on areas of mud,  
newly laid very dense deposits  
of a yellowish brown color. These  
were found to contain  
several spindle shaped bodies  
noted before in similar deposits  
and many <sup>other</sup> living bodies. A  
small amount was placed  
in Bonini's pierce. formol. Much  
effervescence took place at once  
continuing for a minute. Most  
of the deposit floated to the  
top and sank only when shaken.  
suspecting that this action was  
due to its glacial acetic acid  
present I placed a few drops  
of the fresh acid on some  
more of the mud. immediately  
great effervescence took place with  
a slight color of fresh mud.  
or of a fresh marsh.

floating on the water  
surface was a scum that  
had raised from the mud.  
It was composed of a  
least 7 parts of fine sand to  
one of organic matter. It  
was rich in several forms  
of elliptical & rounded organisms  
of a different form than the  
spindles noted before. All was a  
yellowish brown in color. none were  
moving.

August 22, Sunday.

Water gauge at 9:00 A.M.  
3ft 4 3/4 inches.

Today it was warm though the sky was overcast much of the time. Clear the forenoon. I walked up along the river to the Bear River Club crossed in a leaky boat and returned on the opposite side. Last night it was cold with a north wind and there was quite a fall of fall in the air this morning. Small Empidonax very fairly common in the Willows. I saw one or two Water Thrushes and several Pileolated Warblers.

At the Bear River Club I found a Barn Swallow's nest under the outhouse containing young ready to leave. I caught two and banded them. The second flew out over the river and dropped in before reaching the opposite side. I paddled ashore quickly and immediately an immature Night Heron that I had not seen before appeared. I held it a minute or so slipping it in the water and squeezing it and then swallowed it. I doubt if friend Chavis ever hears of that band.

\$ went down has largely gone  
to seed though in full plants  
are now blossoming. Goldenrods  
are now common. I am not sure  
I do not remember it from last  
year. Fox tail grass is not  
so bad as it has been.

Across the river I found  
a great thicket of wild rose  
growing 4 or 5 feet tall. The hips  
were very large.

I have heard that the compass  
plant closes its flowers as soon as  
the sun gets high say by nine  
thirty a.m. I do not know when  
they open. The flowers are small  
and yellow and I have been  
watching them for ships but have  
found none.

In the river I found a  
Northern Phalarope with a broken  
wing tip and brought it in  
to the laboratory.

The remainder of the forenoon  
and almost the entire afternoon were  
spent in writing. Fred Hansen  
& Es & artist were at the club.

Hansen goes in to Brigham tomorrow.  
I mailed in the lot of photos  
that I have here.

McCullam the plumber from  
the Bear River Club was up in  
the evening.

August 23, Monday.

This morning at 7:50 A. M.  
The water gauge registered 3 feet  $6\frac{1}{4}$   
inches. Last night early it  
was very cool with a strong  
north wind. It was cool early  
this morning with an overcast  
sky but on the flats the  
heat was sultry and  
oppressive.

Went out  $3\frac{1}{2}$  this morning.  
The river now has a better  
current at this stage than  
it had at first. I think  
that the overflows below have  
cut out a little. It seemed  
to me that I was able to  
get much farther down than  
usual also with the launch.  
The light current set out  
the Neely Canal No. 4 is bone  
dry. Sackitt tells me that part  
of the old river channel has  
been entirely dry so that the  
mud in it has baked & cracked.  
There are not so many  
ducks now as there were two  
weeks ago and I think that  
they are leaving for other  
territory because of shortage  
in food. Mallards are less  
numerous now but Spoonbills  
are become more common.



There were numbers of least  
Sandpipers and quite a few  
Bairds on the flats as well  
as numbers of Lesser Yellowlegs.  
I collected a dozen of these  
species for study. I also  
shot a female Spoonbill  
and a male Mallard. The  
Mallard seemed entirely normal.  
Christina's thing walked normal.  
The spoonbill had some disease  
which caused necrotic growths  
in the wall of the proventriculus.  
The water gauge registered  
3 <sup>3</sup>/<sub>4</sub> inches.

Patches of alkaline efflorescence  
were still jumping far down on  
the flats. I think that the  
water is lower down here now  
than before. A channel seems to  
have opened toward the south  
opening out into the bay.

One sick mallard was  
captured, but I believe that it  
is afflicted with lead poisoning.  
I captured a young Gadwall  
and a green-winged Teal that  
had injured its neck in some  
way so that it had no  
control over its movements.  
A few drops of rain fell  
during the forenoon and the  
sky was overcast all day.

Three or one half was simply filled with eggs.

In the afternoon I had quite a number of birds in my care for and notes to write. Made a trip in the lunch to the Bear River Club for a letter that had been brought down for me and found that it was a receipt for grain purchased from V. F. Davis.

Yesterday we banded and released twenty immature Redheads. Very few of them have left us at one time I counted fifteen birds all of which seemed to be banded in the river before the pens.

Some time ago Fred Hansen & I set some traps for pelicans on the flats. It found that a Raven had been caught in one of them. Coyote tracks were all about but they had not come near the traps. These coyotes had been hunting for ~~the~~ <sup>the</sup> way at least a mile from the marshes.

The Geese have left the flats and are now in the grain fields up above the gum clubs.

August 24, <sup>Tues.</sup> ~~Monday~~.  
Walt's gauge at 7:00 A.M. 3 ft.  
6 1/2 inches.

Was up at six this morning  
packed up some specimens  
etc to send in. Among them  
an express box ~~filled~~ with four  
samples of alkali scale and  
water from the salt creek marsh.  
A package of stomachs, one of  
exposed film and two of salted  
skins were forwarded by mail.

There were a number of  
odds & ends about the  
laboratory to be straightened out.

Terminated one experiment in  
progress and returned the  
protists that have been used  
in the last series to the large  
fresh water pens.

At five minutes of twelve  
left for Corinne in the launch  
with Bosley. Very hot going  
up though this morning  
early it was cold and  
much like fall.

The water was very low  
but there was not much  
trouble in getting through.  
Not many birds along the  
river.

There were a good many  
young Redwings in the  
water and I saw two

branches of green winged teal.  
Isolated Warbler and a few  
yellow Warblers were common  
along through the willows  
left Duckville at 11:55 and  
arrived Corinne 2:30 P.M.

Got my mail but had  
no word from R. W. Palmer  
Pocatello who is my correspondent  
in regard to sick ducks in  
Idaho. I had come up  
intending to go to Brigham  
and then go up to Bancroft  
Idaho tomorrow morning.  
Decided to go on into Brigham

and wire Palmer for information.  
Left Corinne at 3:43 arrived  
Brigham 4:00 P.M. Registered  
at the Booths Hotel.

Wire Palmer as follows  
"Please wire me immediately  
care Booths Hotel Brigham Utah  
whether any sick birds Chestnutfield  
if conditions warrant will go  
Bancroft tomorrow." This  
was sent officially.

Chased up had a  
haircut and then supper.  
Very good restaurant at the  
Booths.

Aug. 25, Wednesday.

Up this morning at six  
thirty. Had telegram last night  
from P. H. Palmer as follows  
"No. letter follows." My letter  
had been mailed in Pocatello  
last night. I should have  
received it at 8 this morning  
but none came.

Last night I met James  
Kundson on the street. He  
said that there were no sick  
birds below Brigham. Also  
met E. Kundson and talked  
with him for some time.  
Met his brother at the  
Ford agency.

9:00 left for Ogden. Arrived at 10:00  
Registered at the Marine Hotel.  
Had a gold inlay replaced  
in a tooth which required about  
15 minutes. Then bought a  
pair of slender pliers for use in  
banding birds. Went to the  
Ogden State Bank. Deposited some  
checks and drew out  
some money. Did a little  
reading at the library and  
then had lunch.  
Mr. Bigelow was not at  
the bank.  
Left for Salt Lake at

1<sup>st</sup> arriving at 2:00. Everything  
looks very dry along the  
way.

Went at once to Mr. Chamberlain's  
office. He said that he had  
found no man of seal birds  
out in the Siberian Lake district.  
He was anxious to learn  
whether or not the water  
there was not fitted for  
the oyster industry. He  
had a water sample and  
some mud and wanted me  
to take them for analysis.  
I recommended that he send  
them in to the Bureau of  
fisheries.

I asked him in regard to  
drinking water and he said  
that he could not prohibit  
them under the law. I  
told him of some instances  
in which a man had  
shot 250 spoonbills from one  
last fall. J. F. Sherman from  
a box set west of Sledge  
Island. He wanted to know  
the man's but this I  
told him that I did not  
think I could divulge as  
I was in a way a guest  
at the club. I could men-  
tion him this instance as an

an example of such poaching.  
He said this fall that he  
was going to make the club  
account for all their birds  
if possible. The great trouble  
there was in the fact that  
I was not allowed.  
If it were for this  
purpose practice there  
I would fight in the intention  
to kill. Chambers asked  
me if it was  
certainly a man of that  
kind. The eastern men  
have the reputation of  
being better sportsmen than  
most of the local members.  
Chambers will read the  
paper that I suggested on  
"Shall we permit the sale  
of game" at the game wardens  
convention in San Francisco.  
Warden J. C. Smith, address  
Murray, they asked us  
then go out in his car  
and see the birds west  
of the marshes west of  
town. We left at three and  
returned about 6:30 driving  
about forty miles. We  
went west of Salt Lake  
on 12th south street  
passing the surplus canal

at the edge of town. This  
was designed to carry  
flood water from the Jordan  
end so to protect the  
low lying portions of Salt Lake  
City. It carries a large  
stream of water now with  
the water low. Perhaps 3 to  
2 as much as the main stream  
of the Jordan.

Beyond here we came  
to the New Moon Gun Club  
grounds and stopped.  
This was a long slough  
with grass growing along  
to the water's edge. No  
flats about the water.  
The water was shallowly  
alluvial. There were many  
Mallards, Pintails & a few  
green-winged & American teal  
there. Many Coots. No trace  
of sick birds. This slough  
continues on to the west  
as McIntyre's Club.

The new moon club was  
a barn like building. No  
one living there now  
leaving here we went  
west nearly to Garfield  
and had a good view  
of the smelter smoke plume  
across the slopes of the



Ugavik mountains. I with  
said ~~the~~ since the appearance  
of Bulletin 217, little had  
been heard from Dr. Stewart's  
804 theory.

Mar. here we passed  
White Lake and open body  
of water with a good many  
birds on it. Some of these  
sloughs along here housed  
numbers of ducks also.  
Some of these are open to my  
winter.

From here we crossed  
over to Peter's Slough. This  
showed a ~~scirpus~~ ~~of~~ ~~the~~  
grass marsh with dense  
growth and an open  
channel along the side.  
The water had receded  
here and though this was  
step 8 foot banks there  
was a narrow edge  
when an alkali scale  
had raised. There were two  
or three hundred green winged  
Teal on this marsh. I  
saw one bird that tried  
to rise but could not.  
It acted like a sick bird.  
In the opening of what  
was apparently a muskrat  
burrow laid open by receding

water I found feathers of  
one that some animal had  
eaten. Several spots of brown  
white faeces were noticed  
along the bank indicating  
some trout. The water was  
saline to taste and ran with  
a swift current.

These sloughs through  
here are fed by springs.  
The country here was  
level covered with salt  
grass in places and with  
considerable areas of greasewood  
and a *Chrysothamnus*.

There are on other years  
many other flocks through  
here that I now are entirely  
dry. Ducks are much  
more abundant than ordinary  
here. I attribute this to their  
having been driven out about  
by low water. Mr. Smith  
says that flocks of Cate  
he has noticed a considerable  
flight to the south with  
no return in the morning.  
I wonder if there can be  
an early migration or certainly  
the water, salt & many ducks  
have gone somewhere.  
We went out as far as  
Pleasant gram to reach  
Peters.

Returning to the edge of  
town at Redmond we saw  
out again to Williams lake  
a body of water with  
many ducks near its center.  
From here we went in to  
the Central Game Club. There  
was a game building here  
and they had an old boiler  
that had been made into  
a house. The water here is  
in deep channels of ~~reed~~  
kind with rushes & sedges.  
I saw one flock of Canada  
and a number of ducks.  
Met Mr. Sam Williams  
of Salt Lake City President of  
the club and also Mr.  
Fitch & Mr. Rogers who were  
out looking the grounds  
over.

From here it is only a  
short distance to Reddy  
on the point which the  
new State is just beyond.  
Fitch gave me the  
list of clubs very about  
a dozen in all but at least it  
at least something as follows.  
New State, Benjamin's, Reddy's,  
Halloran's, Central, Morse's,  
Williams lake, Black Slough,  
New Moon & M-dentures. The

Other I cannot recall.

Was reported down here this year.

From here we returned to Salt Lake and Smith took dinner with me at Frank & Co's.

Mr. Smith asked me to let Cook to make his sink sink boxes 3 ft square & 3 1/2 ft deep.

Returned to Ogden leaving Salt Lake at 8:00 AM reaching Ogden at 9:00 was very fortunate to lose the fuel during that time and locate water.

Was very glad to visit that low lying country below Salt Lake valley.

Wrote until 12:45.

August 26, Thursday.

Was called this morning at 6:00, ate breakfast and had a horse & buggy brought around at 6:45. Drove west to Ben Belongs in West Hooper and from there visited the mouth of the Weber. It was cool and pleasant in the morning but toward noon became

very hot.

There were great growths  
of skunk weed & fleigum  
growing along the road side.  
Most of the plants had  
purple flowers, but in a  
few places I saw a few  
plants of a yellow-flowered  
species. These should be  
attractive to insects. I saw  
many bees on them, but had  
no time to collect. A few  
birds, Yellowthroat, a small  
flycatcher - (Traill's) & a  
few Pileolated Warblers were  
attracted by these insects.

The entire country here  
was very dry and showed  
the effects of the long dry  
season. At Ogden, no  
water was passing the  
dam of Mr. Weber all being  
diverted into the canal.

Brewer's Blackbirds &  
Meadowlarks, with a few Brewer's  
Sparrows were the common  
species of birds seen.

I stopped & talked for  
a minute with John S. Woodard.  
He says that this year the  
sugar content of the beets  
is low. This is attributed  
to the fact that the dry

season caused the water to  
mature early before all the  
water had been removed by the  
factory plant. It starts about  
September 10.

Will Belcher purchased one  
of his horses in my rig  
just we went in down below  
to the mouth of the river.  
In the south channel  
was a pool here there a  
quarter of a mile away that  
was just by mouth from  
his Russian Mills. I suppose  
the channel was entirely dry  
& saw that toward the  
lake when it was up  
there is a large amount

The north channel in its  
upper portion is deep and was  
filled with water. Below it  
was entirely dry.

The entire stretch where the  
channel formerly spread out on  
the flats was entirely dry  
the ground being caked & hard  
so that the water in the  
channel stops  $1\frac{1}{4}$  to  $1\frac{1}{2}$  miles  
east of the club house. Beyond  
here was one slight pool marking  
the site of the area where  
I found so many dead  
birds last year.

Toward The Lake

At this point the incrustation began. The ground was split into blocks more or less square or round. The efflorescence raised in the centers of these blocks instead of along the cracks. Toward the lake this incrustation gradually increased until it was a heavy crust of salt & soda 1/2 to 1 1/2 inch thick left by the evaporating lake water with moist earth beneath. The lake has receded a mile & one half here and probably more.

I saw one ibis that may have been a sick bird. There were a few ducks where there was water but no sick birds were noted.

Three mountain plovers were seen. Quite a number of ducks were seen on the upland in ponds.

This country has evidently been dry for at least a month and the birds have been driven out entirely.

Mr. Belnap told me that when his grandfather came in 1862 that the lake was far down. A steep banked channel

extended far down past the  
present delta. Later the lake  
came up until the steamer  
City of Corning ran up the Weby  
to a point beyond Belnap's place  
the channels were but  
and fill very rapidly.

I am almost certain  
for the past week I have seen  
consequently there is more than one  
kind of the ducks that are  
occasionally ~~substant~~ common  
inhabitants of the lake front  
have been forced to leave. Part  
of them have gone into the  
upland waters. Others must have  
been driven to make early  
migrations.

Had dinner at Belnap's  
and then drove into Uden  
reaching there at 4:30 P.M.  
left my gun (collecting gear)  
at Uden, to the home of  
fixed. Went to the hotel  
and cleaned up. Wrote a  
few notes before supper.

Met Mr. Bestwick son  
Insecticide & Fungicide inspector.  
There are quite a number of  
farm management men here. They  
do not seem to injure themselves  
with vovvok.

Saw Mr. Bigelow in the  
evening & after dinner he



and Mrs. Bigelow took me  
up Ogden Canyon to Miss Kessel's  
returned to Ogden at 10  
wrote until 1:15 & turned in.

August 27, Friday.

This morning after purchasing  
some Sodis & Magnesia sulphate  
and getting my collecting permit  
at Brownings I went to the  
station. Had not success in  
raising the gun club at Duckville  
until I was about to leave  
the hotel.

left Ogden at 9:20 changed  
at Brigham and arrived at  
Corinne at 10:27. Went to the  
post-office for mail and then  
at the hotel finished a report  
on experimental work of the  
first part of August. Started  
by letter to W. Fisher finishing  
it after dinner.

Booby camp at one had  
dinner and then we left  
for down the river about three.  
Secured the remainder of the  
grain due me at Ferris.

The river has raised a  
little so did not have much  
trouble. Arrived Duckville at  
5:45.

Found things at the laboratory

in very good shape. Bosby  
had made another platform  
during my absence and all  
experiment pens were ready  
for new experiments.

Wrote for a while in the evening  
and then went to bed.

August 28, Saturday.

Water gauge at 7:00 a. m.  
3 ft. 3 $\frac{1}{4}$  inches. Very hot and  
close all day.

Worked during the early  
forenoon at banding birds  
and placing them in experiment  
pens. Installed birds in 7 pens.  
One experiment was begun  
and birds prepared for six  
others. It is my ~~usual~~ custom  
to place birds in the pens for  
weekly four hours with good  
food and water in most cases  
to ~~avoid~~ accustom them to their  
surroundings.

Following are water gauge  
readings during my absence.

Aug. 25	3 ft 4 $\frac{3}{4}$ in.
" 26	3 ft. 3 $\frac{1}{2}$ "
" 27	3 ft. 4 "

Water gauge on Channel 3 $\frac{1}{2}$

Aug. 26 5 inches.

Water gauge on Brown's overflow  
Aug. 25 5 $\frac{1}{2}$  inches.

Was busy at laboratory  
all afternoon.

August 29, Sunday.

Water gauge at 7 00 a.m. 3 ft. 2 1/8 in.  
Began my experiments in the  
six remaining pens in which  
birds were placed yesterday this  
morning. ~~which occupied~~ us until  
10 a.m. cleaned up the  
laboratory a little and  
dissected a very large Mallard  
that had died in pen # 1.

The death of this bird  
occurred very suddenly yesterday  
afternoon. Bosley was working  
about the pens and noticed  
that the bird was apparently  
doing well. Five minutes later  
it was dead. Death was  
due to lead poisoning (see post mortem)  
This bird had a very  
large muscular heart. In the  
hurry I neglected its measurement.

Cleaned up the laboratory then  
and changed clothes. About  
11:30 Mr & Mrs Bigelow & Miss  
Kiesel came down in a car.  
Showed them the laboratory and  
the ducks pens and explained  
to them somewhat of the methods  
of work. They left at 3:00 P.M.  
Mr. Belknap of Hooper arrived  
about 2:30 in another car and  
will remain for a day or two  
I showed him the rights wound

The laboratory and the  
duck pens.

In the evening I went  
down the river as far as No. 4. I  
found a slight ~~raise~~ <sup>raise</sup> water in  
the head of four but no current.  
Since the rise in the water the  
river runs much more swiftly.

The duck pens in the river  
are getting dirty and I will  
be glad if this raise to  
wash them out.

I believe that some of the  
irrigating water was but  
turned back. Accounting for  
this raise now.

No 1 has raised considerably  
and at times a slight current  
set out the channel.

Bright moonlight tonight.  
Four ducks are flying than  
there were a few days ago.

August 30. Monday.

Water Gauge at 7:00 a. m.

3 ft. 2 in. for.

Was up at 6:30 and made  
the rounds of the experiment pens.

~~It~~ Hazy and overcast in the  
morning with a dim haze  
obscuring the mountains all  
day. Not uncomfortably warm.

In the afternoon a strong  
south breeze sprang up.

After breakfast Bosby and  
I took Mr. Belnap with us  
down to Slaughter Island.

Returned about 3:30.

The river has a noticeably  
swifter current since this  
last raise and is carrying much  
silt. The current was very  
swift low down in 3 1/2. A  
fair stream of water was  
flowing out the Neely Canal.

On 3 1/2 we drove in a  
six foot post into the mud  
and moved the water gauge  
to it nailing it fast. The water  
washes the pencil marks on  
these gauges badly so that in  
reality they should be painted  
white and marked in black.  
Howww these will do for this  
season.

The gauge here registered  
~~3 feet 2 inches~~. 3 3/4 inches.

The slight raise of water  
has flooded considerable areas  
on the flats that were not  
covered before. Another 4 or 5  
inches will cover a great deal  
more.

We found the following  
sick birds:

Green-winged teal	5
Pintail	5
Mallard	1
Coot	1
	<hr/>
	12.

Besides these two dead  
Mallards and a dead coot  
were seen.

There were large numbers  
of birds on the flats and  
birds extended to the south  
when I was on Slaughter  
Island as far down as I could  
see. There was a continuous  
band of birds from the west  
char around south in the  
bay and up the east side  
to the head of 3 1/2. Considerable  
water has spread east of  
mud point again.

I think that most of  
the birds brought in would  
have recovered on the flats  
as there is a good sweep  
of water across them now.  
One Pintail was unable

To hold its head up but the  
others were in bitter shape.  
No birds were joined in the  
weed growth lining the upper  
course of  $\frac{1}{2}$  but all were  
in the water lower down.

Water was deep enough  
to run a boat through  
the center of the bay from  
Langley Island without  
much trouble. There is a  
great bar on the east side  
around Davis Island and  
I could not get in there.

Shallows extend in toward  
Langley point but much  
mud was exposed near it.

To the west of Langley  
Island a band of mud  
showed along the rushes  
as far as I could see.

Langley Island was  
connected with the main island  
by a broad mud bar.

The tatter & cyprus on the  
island was all entirely dead.

Near the water edge and in  
patches elsewhere new growth  
was springing up but all  
looked rather sickly and  
I doubt if it makes a  
successful growth. On the  
south shore the root bulbs

are beginning to wash out.  
Leaving the bar. must.

There was very little tall  
growth remaining on the entire  
island. The muskrats appear  
to have deserted their houses.  
I was surprised to find  
savanna sparrows here.

Avocet very abundant and  
I noted great flocks of Northern  
Phalarope and Western sandpiper.

Reached the clubhouse  
again about 3:30 and spent  
the remainder of the afternoon  
in caring for the birds.

Set the new 6x12 pen in  
the water and gave it No. 15.  
It will be used for very weak  
birds to keep the others from  
trampling them. Tried the  
experiment of administering  
water to these very sick birds  
by means of a glass funnel  
and found that with care it  
worked very well. The point  
of the funnel is inserted down  
the throat as far as can be.  
The head is held tilted up but  
with the neck drawn in. Two  
teaspoonful of water approximately  
are poured in and then the  
head raised to straighten the  
neck. This is repeated three  
times.



Had quite a talk with Mr. B. in the evening in regard to the game laws. He told me that at the south Pacific eating house office in Agoda that they got four dollars in deer for shells and one dollar for mixed bucks 1.75 per deer to \$2.50 for seal. With Mallards at that price. This is money in shooting them when the hunter is allowed only 25.

Had a "show" in the evening by Joe Cook.

August 31, Tuesday.

Water gauge at 7:00 a.m.

3 ft 2 1/4 inches.

Went up the river and out Brown's bluff this morning.

There was a good head of water in this bend of North Bay and a great many bucks were present. No sign of sick birds were seen.

The water gauge on Brown's read 7 1/2 inches. It set in a heavy post here, driving it nearly three feet in the mud and nailed the gauge to it. A new gauge with heavy pencil marks was used. These marks wash off unless very heavy or else become obscured by silt in the water.

I crossed to the island  
off the mouth of Browns under  
ordinary conditions this is a  
bar. I found a great  
area of dried Potamogeton  
above which was a  
large extent of alkali efflorescence.  
High water has had little  
effect here.

I visited Knudson's Club on  
returning. These main buildings  
here are well built and are in  
very good shape, though many  
of the outbuildings are tumble down.  
It is strange that this place  
does not burn during the  
frequent fires that sweep across  
the flats.

No trace of ~~the~~ *Myotis*  
so abundant here last year though  
I saw one pile of bat excrement.  
These bats are frequent about the  
buildings in Deschville usually.  
in pairs. I found two hanging  
between two gurnels that were  
nested together, others in corners  
of a screen door or under the  
rafters of the barn. These pairs are  
not necessarily male & female.  
both may be males.

In one of the outbuildings were  
great numbers of mud wasp nests.  
These along the gable covered  
entirely a strip more than

a foot wide and six ten feet  
long. In places new nests had  
been placed upon old ones. Patches  
on the walls covering two square  
feet wholly were not inclosed in.  
In the afternoon and  
evening I prepared my monthly  
expense account and  
accompanying reports. The  
amount for July was  
\$181.22

1915

September 1, Wednesday.

This morning I finished up some oddies and ends at the laboratory, made some dissections etc.

Water gauge at 7:00 a. m. 3 ft. 2 1/4 in.

About 10 left for Corinn.

In Corinn I had dinner with Bosley at the hotel and then certified to my August expenses at the post office.

Also called on B. M. Shaw at the lumber yard and made out a Form 5 for lumber that had been used from time to time. amount \$4.90

A severe rain came up at 5:00 just as we were preparing to leave Corinn. We took refuge in a covered boat belonging to Will Bosley but the roof leaked and we were soaked. Finally left Corinn at six and came down the river.

For one half the distance we skirted the edge of a heavy storm to the south. The air was filled with a fine mist and we were drenched. This happened on every southward trip of the boats. On the return each time we dried off. The alternate wetting and

and consequent evaporation  
drew so much heat from my  
body that I got rather cold.  
On arriving at Rockville, we  
found that it had barely sprinkled.  
A heavy storm in the  
evening up the Bear River Canyon.  
This should raise the river.  
Very chilly here.

September 2, Thursday

Water gauge at 7:00 A. M.  
3 ft. 3 inches.

The morning was cool but with threatening clouds to the south west East.

I spent the day in the laboratory getting caught up with routine work, straightening out notes and working on the experiments in progress.

Many *Ptilodius* Warblers were in the willows and I saw several Wood Pewees.

About eleven a heavy storm passed across south and then east and then came back from the north. A beating rain continued.

until five in the afternoon. Small pools covered the flats at the laboratory almost at once and in an hour a little stream draining from them was running along in front of the experiments just beyond past the laboratory. I found to my disgust that my roof leaks in two or three places and I had to watch my papers to avoid having them ruined.

The air was intensely damp at once in contrast to

The dryness of the past few months. The floor of the laboratory impregnated with salts brought in from the flats in front on our spore immediately absorbed moisture and the boards were wet as though they had been washed. Books became damp and wood the covers warped, guns drew moisture and even my clothing was moist. I will put in a stove as soon as possible in order to counteract this.

A climate like this is very hard on lumber. The laboratory case shows the effects of the alternate drying and expanding already without the paint that if put on it would have been in bad shape.

Immediately when the rain slackened in the evening I set an experiment pin over a post on the open barrens in front of the laboratory and placed some birds in it. Next Bosby got thru rails of the water draining from the flats also. This was intensely saline to the taste. I were thunder & lightning came with storm

September 3 Friday

Water gauge at 7:00 a.m. 3ft. 2 1/2 in.

This morning it was cold and very thing was wet and muddy. The sky was obscured until 4:30 with light sprinkles of rain. Then the sun came out and because of the humidity for some time it was intensely hot. A severe storm passed from Bear River canyon down toward Brigham, Ogden and Salt Lake City.

The entire region to the southeast was obscured.

I went out 5 1/2 in the canal. a fair stream of water was running out the Neely canal. I found that the water gauge at 5 1/2 registered 5 1/2 inches.

Pools of water stood about on the flats every where. The alkaline efflorescence had entirely disappeared being taken into solution again. Part of it has without doubt been washed off but the main amount is held in the surface soils.

Two pintails and one wigeon a beautiful male was found sick and was brought in.

In the afternoon six Redbacks and four Coots were banded and released.





September 4, Saturday.

Water gauge at 7:00 A.M.  $3\frac{1}{2}$ " incl.  
This is the water that fell  
the second and third that is  
causing this rise now.

Clear all day today.

Went out Brown's overflow  
in the forenoon. The water there  
is flowing a good current  
down and a considerable  
amount has reached the bay.  
The gauge registered  $8\frac{1}{8}$  inches.

Water running back into east  
bay has covered moderate areas  
of dead Potamogeton. Cracks extending  
through areas still dry back  
of this contain water that is  
strongly saline.

Halophilous plants or plants  
that are salt enduring have  
covered areas above this that  
last year were moist mud.

The alkali encrustations lower  
down toward the mouth of  
the overflow have not been found  
as yet. Pools on the barrens were  
strongly saline.

Birds however are contenting  
themselves with feeding in the  
fresh water of the open bay.  
There were no birds in East  
Bay nor did any of the pools  
below on the flats have fresh  
bird tracks about them.

No sick birds were seen at all.

The laboratory floor & parts of the walls are still damp today. I had Boshy cut up some dry willows cut when we cleared the river bank for a boat landing. These have laid here all summer and will make good wood. Boshy will go to Corinne tomorrow and will bring back a small stove that he has there.

September 5, Sunday.

Wet gauge at 7:00 A.M. - 2 feet 11 inches.

There was a very heavy dew this morning from the recent precipitation and subsequent evaporation no doubt. I walked up along the willows and had to wear hip boots to keep dry.

There were many Picolated Warblers in the willows with a sprinkling of Ruby-crowned Kinglets Audubon's and Mc Gillivray's Warblers Western Wood Pewee also were fairly common. In the afternoon some juncos passed the laboratory.

The remainder of the day was spent at the

Laboratory.

Alkalies are being to encrust  
on the flats here at the  
laboratory again. It was  
sharp and cool in the  
evening. Received quite a  
bit of mail when Bosby  
returned from Conine.

The number of small birds  
in the willows was much  
in contrast to what it has  
been all summer. I saw  
one or two very few.

These willows form a dense  
cover and it is difficult to  
identify small birds among  
them.

September 6, Monday.

Water gauge at 7:00 A.M. up 10 1/4 inches.  
Cool and pleasant this morning.  
Until 8 the sky was overcast  
but later it cleared and was  
warm and pleasant.

I went out in the and  
rowed down the middle  
of the bay to a point over with  
C. Langley's island without  
difficulty.

A ~~disturbance~~ current was  
setting out the water and  
sent the old sea channel out  
to half again the water gauge.  
The water rose 7 1/2 inches.

When the current  
floated I and some others on  
the bay and contact with  
water. A water extractor was set  
up and put in. The water  
flowed back.

Thousands of ducks were  
banked up on the flats. They  
were higher up than on  
my last visit apparently  
following the water back. Very  
many sick birds were seen.

Two Green-winged Teal and  
a Pintail were captured each  
after a hard chase. This water  
down here is so fresh that

They would have recovered  
without any doubt. The actual  
affection cannot of course take  
place in these great areas that  
now are flooded with fresh  
water. The birds get the poison  
higher up and then, focking with  
the others low down become  
paralyzed and are unable to  
leave. If left here at present, they  
would recover but in stagnating  
water they would die.

Only one dead bird was  
seen today that was fresh and  
its sick stage was advanced  
high up on the swamps.

The higher parts here were  
still wet from the rain of  
September 4, due to their saline  
circumstances. Much of the lower  
portions have been washed clean  
by the rain so that in flooding  
little will remain to be taken  
into solution which will be  
much better for the birds.

I found a great flock of  
Wentworths - low down and shot  
them in two shots.

Messrs. Hurray & Cook, Fred Shannon,  
Dick Rogers, Malcolm Taylor, Curson,  
and Mr. Joe Finch of Health came  
down this afternoon. The first  
five are officers of the club.

Mr. Harry Finch is president.  
They were out in the mud boats  
in the afternoon.

In the evening they were  
at the laboratory for an  
hour and a half.

They reported that few set  
ducks were seen Jan. 10 or  
this way.

The raise in the river has  
flooded the duck pens and  
we moved all of them this  
afternoon and reset the racks  
that keep out the cap.

Sunday evening I caught  
nearly a dozen caps of a  
pound weight each in the  
racks.

September 7, Tuesday.

Water gauge at 7:00 a.m. 2 ft 11 in.  
This shows a slight drop  
for some reason. The water should  
continue to rise or at least hold  
its own now. The birds will  
need more more irrigation but  
with the heavy rains this  
should not require so much  
water.

I went up the river and  
out Brown's flow this morning.  
It was cool and pleasant  
travelling. These are typical  
fall mornings with enough chill  
in the air to make the sun  
feel pleasant. Yesterday a  
storm passed across the hills  
Wabatch and afterwards I  
almost expected to see snow on  
their summit.

Dew was not so heavy this  
morning.

The stronger current in the  
river is very noticeable in running  
the launch. A strong stream  
was running out Brown's flow.  
The water gauge registered  $20\frac{7}{8}$  in.

There was much more water  
in the East Bay than on my last  
visit. About 165 gulls  
harrus californicus, delawarensis & franklini  
were walking about here in



The shallows picking. This part of the bay has been by all summer and great cracks have formed in the ground. With the incoming water myriads of Carabids and spiders have been drowned out and the gulls even capturing these. Most of them picked them from the surface or occasionally felt about with the <sup>bill</sup> ~~bill~~ <sup>bill</sup> immersed. One bird <sup>was</sup> ~~was~~ <sup>was</sup> observed to stand ~~stood~~ <sup>stood</sup> in one place trading with its feet ~~was~~ <sup>was</sup> jamming up the bottom deposits and picking out anything desirable as food.

They were seen drinking and wading. Occasionally one lifted up moss from the bottom and examined it.

A great area here between the <sup>moss</sup> ~~the~~ <sup>ground</sup> ~~the~~ alkali barren and the bottom of the bay represent an area that last year was mud over which the water alternately flowed and receded. Now it is grown thickly with lambquarters and a few other scattering plants. This indicates considerably freshening of the soil.

Strong alkalis were present on the surface mud

made the dry Potamogetons in  
areas not yet flooded.  
Cracks surrounding these <sup>are</sup>  
filled with water, saline to taste.  
The deeper water in the bay  
had a peculiar alkaline taste but  
little salt. The water in  
the extreme shallows was  
very salt.

Water had come up to  
some extent in the bay west of  
Brown's. Ducks were confined to  
the main bay still. I saw  
very few in the newly flooded  
areas.

No sick birds were observed.  
On coming down the overflow  
hollow in two places I flushed  
green-winged Teal from underneath  
the willows. These birds flew  
off low over the water and all  
without quacking birds that are  
becoming affected.

I found a brownish scum  
on certain pools apparently  
an alga & brought some in  
for examination. A grey scum  
was observed washed in from  
the main bay & samples of  
it were collected.

The evening was beautiful.  
A few mosquitoes are out  
since the rain.

September 8, Wednesday.

Water gauge at 7:00 A.M.  
2 ft 10 1/2 inches.

This morning was cool and sharp. at 7:00 the thermometer in the clubhouse stood at 52° and about 10 it had climbed to 58°. The mountains stood out clear and distinct. Every gulch in Willard mountain rises plain white to the south were little mountain, Antelope Island and beyond the Aquatic range. The smoke from the Garfield smelter was plainly visible as the morning progressed this spread from a single column into a broad band obscuring the valley to the east.

To the valley region was clear and to the westward the Aquatic mountains beyond Fremont Island. And some Fremont Island was visible from the doorway of the laboratory. Now however I noted that growth on Black willows anchoring Conflow #1 had been sufficient to cut off this part of my view. During the forenoon I worked on my notes for a

short time. ~~and~~ three experiments  
were terminated and Bobby  
prepared the pens for a  
new set.

The goose brought in  
August 30, now eats from my  
hand without fear but does  
not like to be touched. It  
walks outside the door of  
the pen and when alarmed  
turns around and goes back.

One immature Crane Mallard  
has suddenly become very tame.  
This noon it walked outside  
ate out of my hand and even  
climbed onto my lap for  
grain. After a few mouthfuls  
it would go hurriedly back  
into the pen for a drink  
and then return.

In the morning early I  
set up the stove. One window  
pane at the top of a window  
was removed and a piece of  
galvanized iron with a round  
hole cut in it was substituted.  
A stove pipe was thrust  
through this and through  
a hole cut in the screen.  
The screen was allowed to  
lap over all around the pipe  
so that it can be bound  
down to keep out insects.  
I will have to purchase two

more lengths of pipe and an  
elbow to throw the stove pipe  
up over the roof.

Bosby cut up some willows  
during the afternoon.

I took several pictures  
in the afternoon and worked  
on my notes until 6:30. Had  
Mrs. Sackett & three youngsters  
as visitors.

I started the stove in the  
evening and found that it  
drew very well even with  
the pipe point straight out.

The willows are excellent  
wood for my purpose.  
They burn quietly. All that  
I desire is sufficient heat  
to warm the room and  
keep it dry. As always in  
first starting a stove there  
was much smoke from  
oil on the pipe etc;

September 9, Thursday

Water gauge at 7:00 A.M.  $2\text{ft } 6\frac{3}{4}\text{ in.}$   
Irrigation water must have been  
turned in to account for this rise.  
The duck pens are flooding out.  
Again and tomorrow it will  
be necessary to move them again.  
A launch passing yesterday  
washed down two of the racks.

The thermometer at 7 this morning stood at  $50^{\circ}+$  and the wind had a bite in it that almost made me hunt up a coat.

The mountains were more hazy today.

I went out  $3\frac{1}{2}$  this morning and ran down more than half a mile below where it ~~of~~ comes to the flats without any difficulty.

The water gauge registered  $8\frac{1}{2}$  inches. It seems a little strange that Brown's overflow should rise faster than  $3\frac{1}{2}$  but this is probably due to the fact that the other overflows and various side channels absorb much of the current.

There were myriads of ducks down here, mainly Green-winged Teal, Pintails with many Spoonbills and Mallards. Birds are more numerous than a week ago and are evidently returning now that the water is again covering the bays.

Three sick birds only were seen and captured. The water anywhere here on the flats is fresh enough so that they may recover and this is the explanation.

of why there are not more  
sick birds. Many are affected  
but few become seriously  
disabled. With so much  
new territory flooded there is  
more inducement too to feed  
in the areas where the mud  
is soft.

Returning I crossed over  
to No 3 and went down to  
the flats again. A good current  
was flowing here but the  
ground was not yet covered  
water being confined to the  
flats. There was some water  
between # 2 and # 3 but not  
much. Filling the east  
end of the bay will require  
some time. There is a  
good current out # 1 & 2 now  
and some water out # 4.

In the afternoon I worked  
at the laboratory and made  
some dissections on a female  
*Erismatura jamaicensis*. I started  
these new experiments.

John Darwin got will go  
in to Perry tomorrow. I about  
six I took some letters up to  
him.

September 10, Friday.

Water gauge at 7:00 a.m. 2 ft. 5 1/2 inches.  
Wind was cold and sharp this morning.

Went up the river and out Brown's overflow. I was able to go and down clear to the mouth of the overflow in the launch without trouble and found a strong current setting out into North Bay.

Water gauge Brown's 1 ft 1 inch.  
In the east bay water has flowed back farther than on my previous visit. Wind had blown the water out across the flats and then it had receded leaving an area of soft mud. I counted many Gulls, California Ring-billed & Franklin's and a few Black-billed Stomachs were feeding on this.

Along this newly flooded area I found that the water connected with the main sheet in the bay was fairly fresh. When seepage had come up in little tracks, cracks or large areas it was sure to be intensely salt due to the alkalis taken into solution.

We rowed out across the bay to the island at the mouth of Brown and



found deep water all the  
freshwater. Many ducks were  
feeding in the shallows all  
along. No sick birds were seen  
at all nor do I expect many  
with so much fresh water here.

During June and July sick  
birds found were all encountered  
here on Brown's. Now they are  
all far down on South Bay.

I sometimes think that in  
this Duck malady that there is  
a possibility of two factors in  
operation. At Brown's lake it is  
almost certainly an alkali that  
is killing the birds. Here on Bear  
River the possible presence of  
a ptomaine (but?) obstructs itself  
but is immediately suppressed  
by many facts. A protozoan  
also might seem plausible  
and as such might be carried in  
faeces to Sulare lake. It would  
of necessity seem to be a form  
peculiar to alkaline water &  
incapable of sustaining itself  
in fresh water. There are ~~some~~  
many improbabilities about this  
too. Whichever I turn I am  
forced back to my original  
hypothesis of alkali poisoning  
and that in spite of the fact that  
my experiments are yet are  
rather unsatisfactory.

By the afternoon a strong wind came up from the south blowing 35 or 40 miles an hour.

I took the launch and went out No. 2 to see what the water conditions at the mouth were. But the ~~right~~ hand fork I found little of importance. The flats were entirely dry. Returning and going out the left hand fork I was stopped by shallow water almost at once and proceeded on foot.

There was some water in Pintail neck and east Pass and with the heavy wind this was being driven up across the flats at the rate of two feet to the minute. In the I saw a lot of fish along running water and filling up cracks and depressions. ~~And~~ ~~the~~ ~~fish~~ ~~perceived~~ ~~to~~ ~~gather~~ ~~together~~ ~~at~~ ~~the~~ ~~edge~~ ~~was~~ ~~a~~ ~~large~~ ~~number~~ ~~of~~ ~~insects~~ ~~that~~ ~~was~~ ~~filled~~ ~~with~~ ~~Staphylinids, Crabs,~~ ~~weevils~~ ~~and~~ ~~spiders~~ ~~with~~ ~~many~~ ~~species~~ ~~of~~ ~~Stomatopoda.~~ ~~insects~~ ~~ran~~ ~~hastily~~ ~~on~~ ~~foot~~ ~~of~~ ~~the~~ ~~impending~~ ~~flood~~ ~~and~~ ~~overwhelmed~~ ~~struggled~~ ~~in~~ ~~the~~ ~~water~~ ~~behind~~ ~~the~~ ~~crest.~~

The surface here was covered with an alkaline efflorescence and this was largely taken into solution at once. The front of the incoming water where food was most abundant was therefore strongly impregnated with these salts as was the foam.

Many Pintails and teal were hastening in to this feast and gulls were already present. The ducks were told to leave and hesitated before beating up against the wind.

I returned to the laboratory for some pails & jars and returned with Bosley. He took in the front end of the launch and in going down two the waves washed in so heavily that we had to stop and bail out the front bulkhead to avoid swamping.

We gathered two pails of the alkali water and three two quart jars of foam.

We had to move the duck pens in the river again tonight.

The heavy wind continued until after dark. I attempted to light a fire in the laboratory but it smoked so that I had to put it out.

Sept 11, Saturday.

Water gauge 7:00 A.M. 2 ft 6 1/2 in.

The high wind continued throughout the night from the south and sometime before daylight ~~below~~ up a light rain. This increased until about ten it was quite heavy and made pools on the flats.

The wind was so strong that there was little use in going out anywhere.

The laboratory was very damp and because of the south wind it was not practicable to light a fire - about 10

Went up to the Bear River Club and borrowed a stove pipe elbow. With this I was able to put the pipe straight up and soon had a fire. In a little more than an hour the place was nearly dry again.

I had some trouble in starting the motor as water had gotten in to the spark plug.

Light rains continued until noon and then saw for a sprinkler or two. The afternoon was dry though the wind still continued. At dusk the wind shifted north and it was very chilly.

I shot a Townsend's Solitaire

at the laboratory in the morning  
and in the afternoon a sparrow  
shot in the willows proved to be  
*Melospiza pincolni*.  
Worked on notes and experiments  
all day.

September 12, Sunday,

Water gauge at 7:00 a.m.  $2\text{ft } 6\frac{3}{4}\text{ in.}$

It was cold and windy early with a storm threatening. A heavy storm cloud covered Willard Mountain. When it lifted I saw traces of snow on the higher points. To the south the air was clear and both the Aquin and Laguna mountains were visible. By ten the air had cleared and it was a fine cool fall day.

Went out  $3\frac{1}{2}$  this morning and ran down the channel past Mud Point with the launch. Had some trouble in starting this morning as the spark plug was filled with carbon.

The bay from Bigelow Point down now contains about the amount of water that it did last fall and all is fresh and good. The water extends clear to Slaughter Point and we rowed over there without difficulty. In this island grown with S. cypripedium here we searched carefully for sick birds but found only one a Green-winged Teal.

I saw where Coyotes had eaten half a dozen others. Fresh coyote tracks made in the mud last night were seen.

Thousands of ducks were ~~seen~~

spread out in the bay and many were very tame. I walked past Seal and Spoonbills within gun range. Birds were flying back and forth continually and I sat half an hour in a blind watching them.

With so much fresh water there is little chance for sick birds to get down disabled unless badly affected. One male Pintail was found in the middle of the bay that was helpless and a dead Mallard drake was seen.

Coming back the shot ~~came~~ on the launch came loose behind the propeller and we had to raise the stem into the rowboat and fasten it in place with a nail.

The current in the channels and in the river is exceedingly swift now.

I spent the afternoon at the laboratory in watching some experiments and in writing up notes.

September 13, Monday

Water gauge at 7:00 A.M. 2 ft 5 1/2 in.  
Very cold and sharp this morning  
Cold all day. Partly cloudy with  
light showers. Temperature at 7:00 P.M.  
75°+.

At breakfast we moved  
down No. 2 to its mouth.  
Nearly a dozen Mallards & two  
Redheads were seen in the channel.  
One sick Pintail was captured.

Water was flowing out No  
2 and there was a fair  
amount on the flats. Water  
extended down the center of  
East Pass to a point below  
Seal Pass. and westwards it  
reached to the mouth of #1.

I walked across and searched  
several of the rush islands at  
the mouth of No 2 but found no  
sick birds. There were no  
ducks in here save for a few  
Pintails at the ~~mouth~~ end of  
the water in East Pass. a good  
many birds were gathered at the  
mouth of #1.

Bayless island was still  
dry.

Water was running in here  
rapidly and the ground  
was soaking up as it came  
so that the mud was soft  
as ever. When it had dried



and cracked the surface was  
covered with an alkaline efflorescence.  
Water in cracks was strongly  
saline.

From here I walked down  
through Seal Pass and found  
it entirely dry. Clay throughout  
with the ground hard and  
cracked. Dry ground extended  
to the north as far as snailpoint  
and then the water swung in as  
the point swung to the east.

At the mouth of Seal Pass it  
was at least half a mile to  
the water's edge. The main body  
of ducks lay in the lower  
part of South Bay.

The entire bay save for  
cracks in the soil or isolated pools  
was filled with fresh water. There  
is no reason I suppose that  
birds would not rebound out  
here as readily as in the river.  
Only those with and overclose or  
those that for some reason had  
not access to fresh water for some  
time would become unduly affected.

Extract from a letter to Mr  
Fisher dated Sept. 13, 1915.

"Since the first of September  
experiments with live birds here  
at the laboratory have been going  
on steadily. A very heavy rain  
and wind storm checked me out  
but I was able to continue them  
in a day or two. Since the tenth  
the weather has turned cold as it  
did last year but as yet there  
has been no snow. The river has  
come up again until now it stands  
six inches below the level at the  
time of your visit. It will rise  
more & below during the next ten  
days as there should be quite a  
volume of irrigating water still to  
be turned in.

"After the heavy rain of September  
2 the flats in front of the laboratory  
were flooded with water with  
much alkali in solution. A pen was  
placed over one of these pools and  
two Redbacks and a Green winged  
Teal confined in it. The birds were  
left here for 20 hours (I find that  
it is not practicable to confine  
birds in small pens over shallow  
pools for a longer time as they  
churn the water up until it is  
a thin mud and the plaster thickens  
with it in attempting to bathe.)  
At the end of this period one

redhead and the teal were returned  
to the fresh water pens. They showed  
no ill effects afterward from their  
experience. The second redhead was  
placed in a pen with two other  
ducks and all were given water  
that had been gathered on the  
flats after the heavy storm. In  
thirty hours more this Redhead  
showed all signs of approaching  
paralysis, unable to stand and by  
next day the wings were hanging  
loosely from the sides and the  
bird seemed in a lethargic condition.  
It was placed in fresh water  
but refused to drink of some kind.  
Post-mortem revealed intense intestinal  
irritation.

Another experiment somewhat  
similar in character has just been  
terminated. On Sept. 10 a strong  
south wind (estimated at 35-40  
miles an hour, perhaps more) blew  
water back across the flats at  
the mouth of Channel 2 for  
a distance of half a mile. The  
water on the front of this  
invasion was strongly alkaline  
and masses of foam were thrown  
up. Myriads of small Carabids,  
& Taphylinids, etc. and many  
spiders were drowned and  
masses of seeds of Potamogeton

pectinatus were washed in  
from the bay. Pintails and dead  
came in to feed here in great  
numbers. A supply of the water  
was gathered and added thru  
two syring jars of the foam.  
The water was filled with  
insects & seeds. Two Redheads  
and a downy young seal were  
confined and ~~with~~ given this  
water with two quarts of the  
foam. In about 40 hours  
it was noted that the seal  
was barely able to stand. Twelve  
hours later it was dead. Post  
mortem examination showed the  
typical irritation of the intestinal  
tract, with no other lesions  
present; at the time of death of  
this individual the redheads were  
affected, became weak on their  
feet and let the wings hang  
from the sides. Marked dyspnea  
noted. (This is a symptom in  
all birds with the duck malady).  
These two birds were placed on  
fresh water and now twenty-four  
hours later seem almost normal  
again though still a little  
weak.

These are the first birds  
of the few that I have tried  
that have recovered or become  
better when placed on fresh

water. I attribute this to the fact that solutions used are very strong and their use is continued until the effect upon the body functions is more than can be withstood. Heat-stone birds placed on fresh water after they had become very weak have refused to drink. Water administered through a funnel introduced into the throat just through the epiglottis was recommended experimentally with chickens have not been as satisfactory. After trying various solutions of the chlorides of Calcium, Magnesium & Sodium alone or the together I get the best results with all three in combination. In a Redhead and a Gadwall that were given a solution of 20g NaCl, 12g MgCl<sub>2</sub>, 1/2 g CaCl<sub>2</sub> in ten quarts of water the Redhead died in 72 hours and dissections showed lesions typical of the duck malady. The Gadwall had the proventricular walls filled with dark red cysts a trouble that I have noted in birds kept long in captivity, so it was cast out. Two experiments similar to this are now in progress.

An experiment carried out with Magnesium Chloride & Magnesium

sulphate (Epsom salts), was rather  
omissing as no physiological  
effect could be detected other  
than that the two birds, so treated  
ate about double what any of  
the others under observation did.  
In continuing the head  
experiments xxxxx am trying to  
approximate a minimum fatal  
dose but think that it will  
vary with individuals. xxxx

When work was first begun  
this year I noted a new  
symptom in sick birds and  
have been verifying it until  
I am certain of it. Last  
year I remarked on ocular  
discharges in certain birds and  
and this year have found  
that apparently it is an  
excretory from the Harderian glands  
situated internally at the anterior  
portion of the eyeball. I find  
that whether discharge is  
evident or not and the symptoms  
is practically always present  
namely that paralysis of muscles  
of the membrana nictitans is  
present in greater or less degree.  
This is easily tested by touching  
the eyeball carefully with the  
handle of a pair of tweezers, a bit  
of grass stem or some other  
object. The membrana nictitans

immediately responds by coming  
back across the eye. In sick birds  
it may be brought rapidly across  
the anterior half of the eye and  
then perhaps very slowly the rest  
of the way or in badly affected  
birds it may merely flick  
slightly in its normal position at  
the anterior corner of the  
eye and not come back across  
the eyeball at all. All intermediate  
stages are found ~~occasionally~~ with  
the completion of the bird. I find  
this a simple test to distinguish  
birds suffering from lead poison  
from those afflicted with our  
so-called duck malady.

This symptom is the one now  
that I have been unable to reproduce  
artificially to its fullest extent in  
experiments and because of this  
I am not at all satisfied with  
any of the experiments carried  
out as yet. Occasionally I get  
a slight slowing of movement  
in this eye reflex or even a partial  
paralysis with a slight water  
discharge from the eye but never  
the full development as I see  
it so often in sick birds. This  
may be due to faulty manipulation  
in experiment or again it is  
barely possible that some new  
factor creeps in here. Certainly.

This symptom has been entirely missed by other observers and was ignored by us in the work of last year. It should thus be by any chance bacterial or perhaps infection here we are still right in our contention that an alkaline medium is a necessary factor in the death of these birds. If not the birds would not receive as fresh water.

Our experiment it has established that feed will maintain health in a solution of  $\frac{1}{4}$  pint of alkali salt in 10 quarts of water and that Redheads are unaffected by  $\frac{1}{2}$  pint in 10 quarts of water. Now I am trying direct inoculation in the eye of healthy birds and am giving them these maximums of alkali salts in their water supply. So far this has been without avail as I had expected.

This paralysis of the nictitating membrane existed in Dulau lake birds but I am not certain ~~that~~ in the case of those observed on Lewis lake. Whatever the outcome of our experiments I am certain that the latter are killed by the cumulative effect of the alkali salts & nothing else. If that I am surely convinced.



September 14, Tuesday.

Water gauge at 7:00 a.m. 2 ft 6 1/2 inches  
a sharp frost this morning  
with a temperature of 37° +  
The roof of the laboratory was  
white with frost. The day  
was clear and warm enough  
to be comfortable.

After breakfast I went down  
the river to the head of No 4  
and then down No 4 in the  
rowboat. I found the channel  
that was blown in here last  
summer rather narrow. In  
one or two places the boat butts  
caught on the sides as we  
passed.

Lake No 4 was still entirely  
dry and in going out No 4  
I found that though there  
was a good current the  
water did not reach Mallard  
point. It ran out toward  
Mallard point in a narrow channel  
and then sank into the ground.  
Mud Lake was grown up with  
a moderately dense growth  
of *Pumex* that extended out  
past Mallard and Swiford points.  
This area appeared more like  
some silt left unconsolidated  
than a dry mudflat that  
was covered with silt last  
Spring. There was water in

the bay half a mile out from  
Mallard Point and this carried  
through to the west. I admit  
claims that the bay has  
been entirely dry across here  
this summer but I hardly  
believe that it has myself.  
Mare gulls were scattered along  
here feeding with a few ducks &  
More ducks were seen opposite  
Long Point.

Pinner extended  $\frac{1}{4}$  mile out  
into the Bay at Mud Lake and  
then continued in west past  
Mallard Point. It grew gradually  
thinner and more scattered until  
it entirely disappeared half a  
mile east of Long Point.

At Long Point I found a  
few small Serpens Islands with  
vegetation entirely dead. Beyond  
the shore line ran down to  
Land's End. I followed down  
here and cut in at a great  
Bay that divides Land's End  
from Hansen's Island and worked  
in to the south to the russet  
Ship cut across to the  
old river channel, and followed  
it up to Sackets.

Hundreds of green-winged  
Teal were flocked along this  
old river land with them were  
a few mallards, many Spontills

and pintails. One goose was  
seen.

There was plenty of water  
here now though it has  
come in recently. Water was  
still a little low at the  
upper end but water coming  
in rapidly.

Mosquitoes were quite bad  
in the salt grass. They  
have been common since the  
rain of the second. In spite  
of the chill in the air they  
are bad breeding and coming.

At Sackett's all hands are  
busy repairing boats in order  
to be ready for the beginning of  
the hunting season.

Cook returned from being  
in the evening and I had quite a  
bit of news for me. I ordered  
some new stove pipe as that  
that I am using now is  
borrowed.

September 15, Wednesday.

Water gauge at 7:15 a.m. 2 just  
6<sup>7</sup>/<sub>8</sub> inches. Clear and bright all  
day. There was a heavy frost  
this morning with a temperature  
of 37°. A south wind blew  
all day and was rather  
chilly.

After breakfast we took a  
lunch and went out 3<sup>1</sup>/<sub>2</sub>  
into South Bay. Left the  
lunch opposite Mud Point  
and rowed across to  
Laughlin Point. Here we built  
a blind for a small  
island. I may want to come  
down here this first. Blinds  
here are made by making  
a circle of willows six feet  
in diameter and three feet  
high. Cross-poles of *Scirpus*  
like those get and stowed  
up around the outside to  
furnish shelter.

No sick birds were found  
in here. The water had  
receded somewhat since my  
last visit and there was  
much bare mud here. Coyotes  
had worked all through here.

From here we went on  
down to Laughlin Island.  
Some new growth was showing  
in the *Scirpus*. One sick pintail

was captured on Slaughter  
Island. A few Green-winged Teal  
were noted. They were reluctant  
to fly and two or three really  
desperated weak. No helpless birds  
were observed in the water however.

On the south shore of Slaughter  
Island I found a number of  
Ephydra larval pupal cases & dried  
barbar sand mingled with  
them were quantities of seeds  
of Potamogeton. These must  
have washed in during the  
strong south wind of the  
tenth. The Potamogeton seeds  
were encrusted with salt  
and I think it probable that  
salt water washed in here.

From Slaughter Island we  
rowed on Southwest, and in  
about a mile and a quarter  
came to Neely's Island. This  
now is merely a mud bar  
with stumps of Scirpus stems  
covering one end. The salt  
water has come in and killed  
all vegetation.

The water through here was  
about two inches deep and  
covered a thin grey mud.  
This layer was  $\frac{1}{8}$  of an inch thick  
and beneath the mud was  
black with a strong odor of  
sulphuretted Hydrogen.

For a mile to the south, water conditions remained about the same. The water was two to three inches deep. It gradually ~~deeper~~ grew deeper first to six then eight inches. Finally at the "short tubes" the depth was ten inches. These "short tubes" as they are called by the sportsmen are the rootballs and short stems of an old growth of *S. cirrus*. The sweet water has come in and killed them and they have been gradually inundated until now they are under ten inches of water. Large areas have washed away and many of those remaining are loaded. They form small black islands that show dark in passing over them with the boat.

To this point the water had been sitting with some current to the south and southwest. Now it turned more to the west. I had tasted it all along and found it fairly fresh. Now here at this point in bottom was ~~fairly~~ fresh, very saline. The boat was tied to an oar thrust in the mud and almost immediately salt water began to flow

past driven by a light south  
wind so that here we  
were in the margin between  
salt and fresh.

The water became opaque  
with sediment and stung my  
badly chapped hands sharply.  
Myriads of the brine shrimp  
*Artemia fertilis* drifted rapidly  
past. I filled a two quart  
jar with water and caught  
several hundred in a small  
net. Many were in copulation  
though few females were observed  
that carried well developed  
eggs. Some of the Shrimps were  
very small. A few had a  
reddish yellow tinge and  
many were distinctly greenish  
especially about the anterior  
end. The majority were simply  
a semi transparent dull whitish.  
They were constantly in motion  
swimming slowly up and then  
turning head down and going  
rapidly to bottom. Motion was  
affected by the vibration of  
the lateral jibillae. These  
moved with a wave like  
motion passing from before  
backward.

Pupal cases and fragments  
of *Ephydra* larvae were observed  
but all were dead.

Much of the algae *Nostoc* sp.  
came driving past also.  
In addition some bits of plant  
fiber, grass, *Potamogeton* etc.  
and one sort of string that came  
by in tenuous flaccid sheets  
some white & some brownish  
in color.

From Mud Point to half a  
mile below Elangetis Island were  
thousands of green wings of seal  
Sittars and many mallards.  
Mixed with them were  
hundreds of Avocets and  
an immense number of  
Northern Phalarope. Some were  
~~seen~~ The Northern Phalarope was  
seen in small numbers which  
the only ducks observed  
were sparrowbills. There was  
quite a flight of terns to  
the southwest and a  
good many were on the water.  
From here the bushes  
are Hansens Island were  
entirely below the horizon. We  
seemed to rest in an immense  
lake with mountainous shores  
all about. The water was  
smooth and oily with a  
ripple of wind to the  
south. The whole as  
beautiful a scene as many



be arranged. Little Promontory  
seemed only a mile or so  
away but in reality was  
distant four or five miles.  
Yesterday with the glasses  
I noted that patches of mountain  
maple on the promontory range  
had turned red with the  
frost and they were observed  
again today.

We came back farther south  
and came up the middle of  
the South Bay. Flocks of long  
billed Dowitchers numbers three  
or four thousand birds were  
seen.

This is a long hard  
trip down here but one of  
the most enjoyable that I  
have had this season. My  
hands were a little sore by  
the evening but were not  
bothered and after a hearty  
dinner I felt little fatigue.  
Water gauge  $3\frac{1}{2}$ ,  $8\frac{1}{4}$  in

September 16, Thursday.

Water gauge at 7:00 A.M. 2 ft. 6 $\frac{1}{4}$  in.  
cool and sharp this morning  
and cool all day.

I set up the new stove pipe  
secured from Corinn in the morning  
and wired it all securely.

John Wainport will go in to  
Perry with a load of fish about  
noon so the forenoon was  
spent in working on official  
mail. I am informed that  
only 1000 copies of the Porto Rican  
report will be printed and that to  
secure separate I will have to  
buy them at the rate of \$38 per  
thousand. I ordered 200 if so  
small a number would be printed  
if not 500.

The afternoon was put in on  
experiments, dissections and  
writing of notes.

It turned very cold towards  
evening.

September 17. Friday.

Water gauge at 7:00 a.m. 2 ft. 3½ inches  
Much warmer this morning.  
I felt comfortably in my ordinary  
summer clothes, and during the  
middle of the day it was ~~almost~~  
hot.

Went down No. 2 this morning  
and across into East Pass.  
It was possible this morning  
to get out on the flats at the  
mouth of No. 2 and we rowed  
and knee pushed down some  
distance. When the surface  
was covered with moss that  
had been become dry during the  
summer the going was very  
hard.

On a small island, I  
built a blind and set out  
plover decoys for shore birds.  
A few greater yellowlegs and  
Northern Shglarope came in  
well but I missed. I shot two  
Aravat. They flew by paying no  
attention to the decoys. About 10:30  
the flight practically ceased.

It was exceedingly hot  
in the blind. About 11:30 I gave  
it up and came home.

Water has gone down East  
Pass now as far as I could  
see. Bayless Island is still  
dry. When I came down

a slight current was setting out  
East Pass. a light south wind  
soon turned. it however and  
when I left it was flowing  
back.

Spent the afternoon in making  
dissection of bird from Experiment 49  
and in writing.

September 18, Saturday.

Water gauge at 7:00 a.m. 2 ft. 5 inches.  
Warm this morning when I  
got and very hot during  
the day.

After breakfast I went to  
Hansen's in the launch and  
with Fred Hansen went by team  
across to the Willard Spur. We  
made this same trip just a  
year ago today.

Great areas of dry Scirpus  
had been burned off during the  
summer. Fires had been set  
by fishermen. So that growths  
bordering the dry channels  
were entirely gone.

Hansen says that after  
the last rain there was a  
great flight of Pintails over here  
toward the Willard Spur.

In the lower part of the  
fourth channel or East Channel we  
found some water but it  
was not flowing. No ducks were  
in here. In the Willard  
Spur water was visible only  
in a small area to the west  
of Willard. The area on which  
I found sick birds last year  
was entirely dry and evidently  
had been so for most of the  
summer. Far out in what

we took to be water we  
could see some birds and  
finally worked across to them.  
We finally came to water  
in the region between the creek  
mouth at Willard and the  
Gun Club house and found it  
very salt. Artemia fertilis  
was abundant in it.

growths of Potamogeton had  
started here early in the season  
but had been killed off.

A small stream coming  
down the canyon at Willard  
spread out into a marsh  
at the shore of the spur. In the  
salt water below this were  
flocks of 8 poorbills and in  
the fresher water above numbers  
of Pintails.

Sick birds have been reported  
to me in numbers earlier in the  
season but I was able to  
find only the following dead

Green-winged Teal	11
Redhead immature	4
8 tilt	1

6.

so that the mortality cannot  
have been very great.

We looked carefully for sick  
birds through the grass but  
found only one Mallard that

seemed affected at all and it was not serious as if could fly.

The water in the swamps was rotten with  $H_2S$  and the mud was black and evil smelling. We worked up to within a mile of Willard and then returned to the rig by another route that took us away from the mud. The water has been fresh early in the season as on the dry mudflats were the remains of many carp that had been stranded when the water went down. Duck bones from last year were common also.

This fourth channel rises in the Black Slough a marsh fed by spring rising at the base of the foothills immediately north of Brigham. In high water the fourth channel receives water from Bear River near the old channel at Hunsakis.

Jim Hull sent word to me by Hansen that two years ago he found birds very bad at the mouth of Sulphur Creek. He attributed this to the fact that the sugar factory wash

from Garland emptied his. They  
are said to use two carloads  
of acid in cleaning out the plant  
every season. The time of cleaning  
is now about at hand.

We ate lunch and then  
drove up across the flats  
toward the old Indian encampment.  
We picked up a number of  
the stones about that Haskins  
wanted to take home with him  
and I brought a few to the  
laboratory. I found a dozen  
small arrowheads - most of  
them more or less unshaped all  
made of obsidian.

There is a great bar  
across the Willard Spur now  
and the water is very low.

On our way out we saw  
a porcupine at a long distance  
and drove up to it. It was  
out on the open flats and  
had just come down from the  
Mountains as later we saw  
its track leading across the  
shallow water in the spur.

When it sighted us it broke  
into an ungainly gallop. We  
rounded it up and it tried  
always to present the ~~side~~  
back to us. The animal  
panted loudly with frothing



months after a slight exertion.

Returned to Hansen's about six and ~~returned~~ came back to the laboratory.

Today I had Bosley clear the sod out under the laboratory for a space of 2 1/2 feet back from the edge as a precaution against fire.

September 19, Sunday.

Water gauge at 7:00 a.m. 2 ft. 5 3/4 in. Very warm all day today or so it seemed after the cool weather that we have had.

I worked at the laboratory nearly all day today getting up my notes, writing letters, etc.

Bosley went in to Corinne today and brought out mail and some boxes in which to ship pintails.

Received a Yale lock for the laboratory and a jar Coplin staining jar to replace one that had been broken.

For a week now the fall hatch of Vanessa antiopea have been about in the willows. The insects are brightly colored. They perch on willow twigs in somewhat open places.

September 20 Monday.

W. to C. way at 7:00. A.M. - 2 ft. 6 1/2 in.

Warm this morning but cool and pleasant for sleeping last night.

I went down the river and out 3 1/2 after breakfast. Water gauge on S 1/2 registered 8 1/4 inches.

WE went out near Davis Island and then crossed in the mud to Slaughter Point. Two mallards suffering from lead poison were captured and one shot dead. A number of other seals perhaps a dozen were seen that were affected but were not so down so that they could not fly. Frequently one would remain on the water after a flock had flown. As we came near it it usually got up with some difficulty and flew off low over the water.

At Slaughter Point I saw three coyotes had captured and eaten 5 or 10 birds.

The subshrubs here have suffered from the attacks of a striped *Platypella*. On nearly every plant the leaves had been badly eaten. The caterpillars

*Simya henrici* Grote (specimens are not typical)

At irregular notches in the sides of the leaves and in some places ate the entire outer covering of the blade leaving the channeled tissue of the interior. Most of the puberula growth was gone and the gnats had disappeared leaving behind them great quantities of droppings. On a few green plants however I found a number and others were discovered eating the hard green blades of *Cyperus paludosus*.

I gathered a hundred or more in a two quart jar and brought them in. At the laboratory I made a cage of wire screen with dirt in the bottom and placed the caterpillars in it giving them fresh puberula leaves. They began eating at once.

There were thousands of chicks on South Baye mainly Greenwinged Teal and Pintails. I have tried to form some plans for estimating their numbers but without success thus far.

In the afternoon we banded and released *Hirundo* - more Redheads. None of them went any distance.

September 21, Tuesday.

Water gauge at 4:00 A.M. 2 ft. 6 1/2 inches.

Cool this morning but I was not uncomfortable in my summer clothing.

By ten o'clock it was hot.

Went up the river and out Brown's overflow. The overflow is a little shallower now. I found that the water gauge registered exactly one foot.

A great flock of teal and pintails were feeding to the west but there were not so many birds at the mouth of Brown's as usual. Very few were in the newly flooded bay.

I crossed the bay in toward the mouth of Sulphur Creek but saw no sign of pint birds. The water in the bay was no different in appearance or taste from that in the river.

Hundreds of northern Phalarope were feeding on the water and there was quite a flight of least and Pectoral Sandpeeps from the north.

at the Bear River Club Mr. Davis and Thorwald Olsen are down at the guide houses and Mr. Neal, Clifford Thom, Don

Davis and the other help  
at the clubhouse. All are busy  
cleaning up.

On the evening I went up  
and stopped at the guide's house  
for a few minutes and talked with  
Mr. Davis. Ordered a bushel  
of wheat from him.

I then went up and spent  
the evening with Mrs. Mat.

He told me of meeting a  
Mr. Hunsaker who had been on the  
Albatross as an assistant of  
Agassiz. While at Guam they  
had found great mortality among  
sea birds. They piled up dead  
in the surf by the thousands.  
On investigation it was found  
that the trouble was due to a  
sort of ~~be~~ ~~ring~~ parasite similar  
to trachina. This was found in  
the muscles. It of course from  
eating fish that I was affected  
in the same way.

He said that in the forenoon  
he had been talking with Showald  
Dpsen in regard to sick ducks  
and the lack of them this year.

Showald said yes it may be a  
long time before we have any more.  
He said that about twenty years  
ago while market hunting near the  
birds took to dying and that

Thousands of them perished.  
The ruffus in North Shore  
Island struck so that they  
could hardly bear to shoot  
them: I must inquire into  
this.

September 22, Wednesday.

Wets gauge at 7:00 A.M. 2 ft. 6 1/2 in.  
Cool and pleasant this morning  
and not too hot in the  
middle of the day. I went out  
3 1/2 to the Neely canal and  
then down the old River channel.  
A strong head of water was  
coming down the canal but  
in its upper end of the  
channel it was still  
shallow. I found few ducks  
until I reached the first  
fork to the west where  
the channel runs ~~east~~ north  
and south.

The Bulrushes along all  
showed signs of the Caterpillar  
work noted on Slaughter Point.  
It is strange that this insect  
has not been noticed near the  
laboratory. The infestation here  
was severe.

I dug a hole at the  
west channel, in a point to  
use as a blind & may  
want to shoot here one day  
and there is quite a flight  
up from the south.

One Western Gull was  
found that was very thin  
and weak. Bosley caught it  
as it was trying to dive in

Some shallow water. No other  
sign of sick birds was  
seen.

I crossed over to the  
old time channel known as  
Dry willows. The channel here  
now contains no water at all  
and is marked simply by a  
narrow depression. Quantities of  
very old dead willows were stream  
lining especially on the south  
bank. Stumps six inch through  
were not uncommon and  
smaller stems lying about in  
confusion were abundant. As  
a whole ground here two feet  
and one half high by ten or  
twelve feet across that last  
year had considerable Indian  
work and now discovered to  
be dirt from the earth of an  
old coyote den. Several solitary  
wraps were noted about it.

On my last visit down  
here a week or so ago I  
picked up some fresh skunk  
excrement consisting entirely of  
butts remains.

Cook went in to Corinne this  
afternoon with the large launch  
and the flatboat.

Some time ago Lockett & I  
were talking about cattle and



I offered to put up the money  
to buy some willows if we  
would run them with this.  
and we would split any profits  
between us. Today in P.M. I  
that he had up a haul of  
16 that were good quality and I  
was able to get part of them

September 23. Thursday.

Water gauge at 7:00 a.m. 2 ft. 6  $\frac{5}{8}$  in.  
Quite hot today. I remained  
at the laboratory nearly all day  
getting up some official correspondence  
and notes.

Early in the morning I  
walked up along the willows  
but did not see a great  
deal of interest. The compass  
plant is still in bloom. Most  
of the Sweet clover is now dry  
and has gone to seed. The  
foxtail grass <sup>heads</sup> have entirely disappeared.  
Cook returned from Corinne this  
evening bringing mail. a letter  
from the office informed me that  
chucks have been dying on Lake  
Bowdoin in Montana.

The officers of the gun club  
came down in the evening.  
Cook brought 21,000 shells 42 cases  
from Corinne. 9,000 of these are  
club shells. The other twelve

Thousands belong to members, Sam  
Sherman I think has 6000 of  
them. This seems like an enormous  
amount of ammunition but is  
at that only a fraction of what  
will be used. Perhaps it may  
represent two thirds or even  
less of the total number. If  
the shoot this season is  
as great as last i.e. 12000 birds  
it is less than half the  
total amount.

The manager for this  
season Art Ball came down  
with them. He is a  
very pleasant gentleman.

Two autos came bringing  
with them the full supply  
of law. It is doubtful if  
it can be shipped legally now  
because of the new liquor  
law.

September 24, Friday.

Water gauge at 7:00 A.M. 2 ft. 6 1/2 in  
Cool and pleasant this  
morning and 2 p.m. is  
threatening and the sky  
was overcast during much of  
the day.

3 1/2 After breakfast I went out  
land down into South Bay.  
Saw a few seal that apparently were  
flying were seen but otherwise  
I saw no sign of sick birds. The  
mosquitoes in the bushes on  
Scarlight's Point were worse than  
I have seen them any time this  
season. I found it hardly  
possible to stay there more than  
a few minutes and then a  
cloud of the insects followed  
us out for the bay. They  
were very bad everywhere all  
day long.

There were as usual many  
ducks in the bay.

All the alkaline areas now  
have soaked up and are damp  
even though several inches  
above water.

Angie McDonald was down  
the building blinds on the  
west shore for use after  
the mulling season.  
Afternoon I made two

crates in which to ship  
ten live pintails to Colonel J. C.  
O'Connor Virginia Beach, Va. Dr.  
Fisher had requested that I  
send these. The birds are to  
be used for breeding purposes.  
I took large boxes and  
put slats across the tops. A  
thin board was fastened in  
one corner for water and about  
six pounds of wheat will  
accompany each shipment.

Some ammunition dealers or  
travelling salesman came down  
in a Ford. I showed  
them the laboratory and the  
experiment pens. And they  
seemed much interested.

After that I went up  
to the Bear River Club. Mr.  
Davis had another bushel of  
wheat for me. This is worth  
80 cents now.

I tried to find an Atlas  
at the clubhouse but Mr. Neal  
was unable to locate one. I  
wish to know the location  
of Lake Bowdoin in Montana.  
I finally found a station known  
as Bowdoin on the Great  
Northern Railroad which may  
be the place.

In talking with Thorvald  
Asens at the Bear River Club  
this afternoon he said that he  
began to shoot on this marsh  
in 1890. That in 1895 or prior  
he had noted in the fall that  
there were ~~many~~ <sup>at</sup> times  
many dead birds in the rushes.  
At that time water was  
much higher on the marsh  
These birds were noted on  
several years and were birds  
that had died during the  
summer as they were still  
decaying. Most of them were  
on the north shore of North Bay  
& in the pools back of Slaughter  
Point they did not occur on  
open water at all. No live  
sick birds were seen. At times  
the stench from the bodies was  
very great. No one paid any  
attention to this at the time.  
Chris Holt who began shooting  
here at about the same time  
verified these statements.  
In the evening I figured  
as best I could the expense  
of a trip to Lake Bowdoin  
Montana. Have been able to  
learn little from the ticket  
agent in Brigham or anyone  
else but am satisfied that

The place is in the Milk river valley not far from Glasgow. It will take two days to reach it from Brigham. The only fare that I could learn was the rate from Brigham to Great Falls Montana. This is \$17.65. Mileage to Glasgow is 276 miles. At five cents a mile this is \$13.80

Following is my estimate

Duckville to Brigham & return	\$4.50
Brigham to Bowdoin 31.45 each way	62.90
Pullman 2 nights each way @ 5 <sup>00</sup>	10.00
Pullman porter 4 days	1.00
Train subsistence 4 days @ 3 <sup>00</sup>	12.00
Subsistence Bowdoin 6 days @ 3 <sup>35</sup>	20.10
living here	15.00
Accidentals	10.00
<b>Total</b>	<b>135.50</b>

Estimate for subsistence at Bowdoin is undoubtedly high. And I mean need no living here.

Sent the following night letter telephoning it to Brigham.

Biological Survey,  
Agriculture, Washington, D.C.

Please amend food habits authorization to include Montana. May require forty dollar increase. Plan to leave here thirtieth, Return Oct. 10. Will start unless instructed otherwise by wire.

September 25, Sunday

Watch page set 7:00 a.m.

24. 5 3/4 miles

I had intended to take the  
pintails to Corinne this morning  
and ship them. When I woke  
a heavy wind was blowing.  
Some rain had fallen during  
the night and by morn it  
was raining again and  
continued until almost night.

Recently there had been  
a good many horses about  
and the increase in House  
flies is very noticeable.

Eph Sackett, a young fellow  
about 17 who shot them last  
fall was in during the forenoon.

He said that when the but  
pulp came down last fall in  
November that he found sick  
Mallards that had eaten it.

They sat around appearing  
rather dopy and when  
opened were full of but pulp.

He took the game, swabbed & fattened  
some jars of it and set them  
in.

This is directly opposite the  
ropat Andrew Jensen & Frank Larsen  
to me. These birds were observed  
out #4. Sackett said that one  
day he found four Mallards.

After the freeze up he found  
~~of~~ two or three hundred  
Mallards and a few pintails  
that were sick about the  
air holes. The birds could  
fly a little but were run  
down on skates. They were  
all fat.

I am beginning to think  
that I made a mistake in  
leaving them last fall when I  
did. An extended period  
of observation would be of  
value.

About five I banded fifteen  
Redheads and turned them  
out. Nearly all these were  
females and two or three  
of these still had the breast  
muscles undeveloped. There  
are always from a dozen to  
sixteen birds that hang around  
outside the pens. They drift  
away one by one and others  
that I release take their place.



September 26 Sunday.

Water gauge at 7:00 A.M.

2 ft.  $3\frac{1}{2}$  in inches.

Last night about ten  
a heavy storm with  
much thunder and lightning

passed up the river and  
then came back. The usual  
course of these storms is

across to the south of us  
from the Promontory Range toward  
Brigham they up along the  
Wasatch and back again

down the river or across  
to the north. We got only  
the edge of the rain. I

was worried some for fear  
that the roof of the Laboratory  
might leak but found  
every thing dry this morning.

Rain continued until  
noon and the flats in  
front of the Laboratory were flooded.

Men from Sacalls were shooting  
toward North Bay this morning.  
Many ducks were swinging  
up the river and lighting out  
on the dry flats to feed.

This storm will  
check the set of experiments  
now in progress and I will  
terminate all of them except  
two I think.

Experiments in alkali poison  
do not work so well in cold  
weather as in hot for this  
reason. During cold weather  
transpiration of moisture is  
much less and the birds  
do not need so much water.  
Again the effect of the alkalis  
is reduced by the water  
extracting water from the  
lesser ~~are~~ <sup>are</sup> ~~lessened~~.

One of my female pintails  
died today from lead poisoning.  
This will break one of my  
pairs that I was going to  
ship to Col. O'Conor.

Worked on notes and  
the mist storm during the forenoon.

Rain continued off and on  
during the forenoon. The flats  
are covered with water and  
numbers of ducks are sweeping  
out to feed. I noted Pintails &  
Greenwinged teal.

Permitted my plan for a  
field laboratory to be continued  
here, this afternoon.

Banded and rebanded 5  
Greenwinged teal about five in the  
afternoon.

I now fall on Willard Mountain  
down to about 9,000 feet. Bright  
sharp tonight.

Sept. 27 Monday.

Water gauge at 7:00 a.m.  
2 ft 3 in. Clear today but  
very damp and muddy.  
Worked at the laboratory  
all day. Put in three or  
four hours in getting the  
microtome knife in order  
and then in the afternoon  
cut some sections.

The launch went to Coimbatore  
this morning so I went  
up the ducks that are to go  
to Col. O'Connor. 4 pairs. Clipped  
one wing & sent Bosley up  
with them but he failed to  
get them off in the afternoon  
train as he should.

September 28, Tuesday.

Water gauge at 7:50 a.m.  
2 ft. 5 in. Clear and fine all  
day. I finished and mounted  
the sections and washed  
and terminated most of the  
experiments today.

September 29, Wednesday.

Finished cleaning up  
around the laboratory today.  
Had the pump put in order  
and released the last of the lock.

Sept. 30, Thursday.

This morning was up at five  
left Duckville in the boat at  
6:15 and arrived at Corinne at 8:15  
Thermometer at 36° this morning.  
Fine ride up the river. Very pleasant.  
The air was cool and sharp  
but not too raw. The mountains  
were dim with haze and the  
rising sun cast purple and  
mauve tints through the mist.  
Parker met the boat with his  
train this morning and my  
baggage was soon over board.  
Had suitcase, chest & trunk  
with me. Got my mail in Corinne.  
Found a letter from Mr. Fisher  
authorizing work in Montana,  
Colorado, & Wyoming and increasing  
my food habits authorization to  
\$260<sup>00</sup>. I had written to the  
Game Warden of Montana asking for  
a permit. Mr. H. De Hart replied  
saying that no permit was  
necessary as either he or his  
deputy E. C. Carruth of Navas would  
meet me in Malta.

Left Corinne at 8:46 arrived  
Brigham 9:08 P. M. Ticket was  
\$23.20 to Malta. Could get no  
train until 4:15 in the afternoon.  
Found that the ticket agent was  
J. F. Spindler with whom I  
walked down Grand Canyon in 1907

In Brigham I met Mr. Ed Ryan  
of Corinne. He introduced to Mr.  
Selvason at the Securities Bank  
enabling me to cash a check  
for \$150.59. Got a haircut, shot  
shin. Had a coat fixed, some  
shoes repaired and various  
other things during the forenoon.  
Had lunch at the Booth Hotel,  
and spent the afternoon there in  
writing to Dr. Fisher & in finishing  
my September Duck disease  
expense account amount was  
\$148.42.

Left Brigham via U. S. L. at  
4:15 P. M. Bought Pullman through  
to Butte.

Met James Kundaon in the  
forenoon and had quite a talk  
with him.

Fine and clear all day and  
pleasantly warm.

North of Brigham we passed  
what must be Box Lake lake a  
shallow expanse with no birds  
visible on it. Above here the  
track led up a broad valley  
with Bear River to the left.

Finally we approached a  
great notch in the hills through  
which Bear River enters the valley.  
The Great Bute has been cut off  
from the main mountain

mass and stands out as a landmark the rock being visible all through the valley in clear weather.

At this point the river was narrow swift and full of rapids. It has cut a gorge through the bed rock ~~that~~ hundred feet or more deep and meanders across the bottom.

Entering the canyon it was very narrow, as if power plants stood here. On each side of the canyon are irrigation ditches run and finally we came to the dam. Both ditches still ran full of water and at the dam the entire stream was diverted. No water passed over the dam at all but fifty an amount went through it either through spillways or through leaks I could not determine which. When this dam is opened a great volume of water will come below. At present there is not 1/10 the volume of water that there is at the mouth of ~~the~~ immediately below the dam.

Above here the water backed up for a long way. Finally we came to Cache junction. Beyond here was a broad valley. The

Mountains on either side, covered  
a light bill of snow. The river  
had risen above the fall point  
was broad and shallow & only  
occasional small growth  
willows showed. The rest of place  
the banks were bare & denuded  
presumably by man. Country was  
very well cultivated.  
I saw many swamps but  
all were entirely dry.

October 1, Friday.

Arrived in Butte Montana  
6:45 this morning. No train  
went north to the main line  
until 3 P.M. so that I had  
most of the day before me.  
Walked up town had breakfast  
and then made a full day  
reservation to Malta Montana  
at the great northern office.  
Rate \$1.50

At nine I went over to  
the Public library and did  
some reading on cholera des  
poules etc until noon.  
A very good library. Many of  
the books seemed to have been  
damaged by fire.  
In the afternoon I walked  
about for awhile bought in  
view of that and did a little

more reading. Left at 3:00.  
It was clear all day  
with scattered clouds.  
A great deal of smoke  
hung over the city from  
the smelters but drifted  
away as the land is on  
a hill.

One leaving on the train  
the track swung around  
in a great horseshoe  
around a small valley  
and ascended along the  
opposite slope. The hill  
on which Butte was located  
came down to the level  
in a broad swell. The  
streets running up will  
from the depot but the  
descent is rather gradual.

Smelters and plants were  
protected by light board  
fences, with tops studded  
with nails and guarded  
further by two wires lightly  
charged with electricity. These  
operated an alarm system.  
These precautions were due I  
was told to recent labor  
troubles.

The hills at Butte were  
entirely bare but around the  
other side were entered a



canyon with its sides  
covered with little white  
pines and with, Alder, wolf-  
berry Betula and other  
characteristic shrubs along  
a small stream that we  
followed. This seemed fine  
country but though I  
watched closely not a bird  
was seen.

Reached Helena at six a  
very pretty place. Sunnyside and  
Boulder Town attractive also.  
Foliage now through the  
canyon was touched with  
frost turning it to dull red  
and yellow that was very  
beautiful. Save for its lack  
of bird life I have never  
had a more pleasant  
railroad journey.

I intended to retire  
early but met a young  
Geologist & mining Engineer  
(and) talked with the  
town.

October 2, Saturday.

Arrived at Malte 6:00 a.m.  
did some work on notes & ~~completed~~  
completed report on monthly expenses  
account.

Following is copy of Form Bi-130.

Letter of authority 20-Bi

original allotment \$1000.00

Month Sept 1-30, 1915.

Amount available at beginning

of period

553.59

Total expenditure for period covered

203.32

unrelated to  
unexpended balance

350.27

Estimated expenditure for coming

month under this authorization

156.00

Called Mr. C. F. Carruth Deputy  
Warden from Navarre at the Milk  
River Valley Game Club and he  
told me that some one would  
come in after me. Mr. C. F. Metz  
manager of the club came in  
about ten. I met Mr. Coster  
president of the club and Mr.  
M. Skowley at the hotel. Mr.  
Coster said that a good many  
sick birds had occurred about  
Sept. 1, but thought that I would  
find none now. He attributed the  
trouble to this: that about  
the lake were several spots where  
there was much alkali.  
Usual during the season.

There is much wind which  
keeps the water stirred up.  
This Sept season however the  
lake had laid absolutely quiet  
for 6 weeks or so ~~ago~~ upon  
the water being stagnant. This  
we thought would increase the  
amount of alkali at the bad  
spots.

Mr. Mats took me out  
in his Ford. The Clubhouse  
is 9 miles from Malta near  
the line of the Great Northern.  
The country here was rolling  
and a somewhat sandy  
loess(?) A few Meadowlarks and  
some Horned Larks were seen.  
Also noted a Swainson's Hawk and  
one Jim Kidie's.

The Milk River Valley Game Club  
has about 77 members throughout  
this part of the State. Dues  
are five dollars per annum. This  
is supposed to pay for improvements  
while the club is self supporting  
during the run. The Clubhouse  
is a large structure 20 x 40 feet  
and is well finished inside, with  
hard wood floors, paneled brown  
board walls & ceiling. The second  
story is a dormitory with a  
row of beds in it. Board two  
dollars per day. Round trip to  
Malta \$8.00.

I found Mr. Carruth a large  
man and a great talker.  
He told me that he came  
out here this year the first  
week of September and that  
in going about the lake he had  
discovered large numbers of  
dead ducks and a few sick  
ones. Half a dozen were gathered  
up & shipped alive to Helena,  
to stay game warden Mc Hart.  
Certain of these were examined  
by a Druggist Carl Stutz who  
pronounced them to be a cholera.  
Others were sent in to Washington.  
Men seeing these sick birds  
were afraid to shoot & eat  
the ducks for fear of  
some poison in them and this  
has entirely spoiled the season  
for the gun club. Last year  
1875 was taken in the 1st of  
June this year in the 22nd  
month receipts were only \$5.00  
I think birds practically  
by the month as a plenty  
I had the numbers from  
to shoot with more  
I had some much concerned  
over the matter and those  
concerned in the management  
of the club wanted assurance  
that it would not occur  
next year. Apparently some

been much about it. I found  
Mr. M. at the clubhouse in <sup>in communication</sup>  
in the matter and considered  
most of information gained  
from him unverdalemente. He  
is directly interested in maintaining  
the club and said that the  
publicity given this thing had  
killed the season for the club.  
I found Mr. Carruth in a  
hurry to get home which did  
not work on. He set a  
rather incubated the idea for him.  
Not well informed on local conditions  
in the Islands to look things over  
and after considerable trying  
trouble we were off. We went  
to Woody Island and  
looked around. Will not detail  
observations now as I expect to  
visit this place again soon.  
Tomorrow. Two sick green-winged  
Teal were seen but could not  
be captured.

Mr. Carruth had a  
Spoonbill alive for me that he  
had captured yesterday. Typical  
chick malady.

The morning was heavy  
with fog. Late the fog lifted  
a gray sky and then  
it began to rain - old chair

Toward evening, club members.  
Met several club members.  
They got a fair amount of  
but nothing extraordinary. The  
men brought in several  
Canoes back, gadwall, wigeon  
a few Curlew, and a few  
Buffbreast also a few Green  
Wings... Wilson & his  
about the club members.

October 3, Sunday.

Daylight comes much earlier here than on Bear River. It began to get light about a quarter past five. Every one else was up so I went out too. A cold wind was blowing & rain in from the north and it was raw and disagreeable.

After breakfast I worked on the birds on hand making some careful dissections. The live bird secured by Mr. Carruth has all the symptoms of a bacterial disease. Lesions were present in lungs and kidneys especially. It had all the appearance of avian cholera of one variety or another. It is entirely distinct from the Utah trouble on which I have been working. So companion with the sick bird I opened a Spornbill that I shot last night. To my surprise I found its spleen greatly swollen and enlarged. This bird was otherwise that I observed seemed a little reluctant to fly but got up well when it started. It may be that all these are affected. A third bird picked up dead by Mr. Carruth was evidently a cripple.

Mr. M. S. Kowler of Great Northern Hotel, Malta Montana. Gave me some information in regard to

the sickness. He was down  
here in August about ten days  
or a little longer previous  
to the opening in B.H.I. He noted  
a number of dead birds floating  
in the water vegetation in front  
of the clubhouse. In going to  
woodland behind in a canoe a  
large sick bird was picked up.  
They could swim but were unable  
to fly. Usually they come and then  
coming up were easily captured.  
The head and neck seemed  
affected. Several of these birds  
died in the canoe on the way  
to the Club house - two sick  
birds were picked up but then died.  
A sick pelican was seen. Three  
sick birds certainly helpless, were  
taken in to Malta. These in all  
died before reaching home.  
The other three in about a week  
were able to walk, feet very  
abundant. Their wings were  
clipped and they were released  
and were found out in a day or  
two.

About ten the rain spiced  
up and I walked out near  
the border of the lake to the south.  
The lake lies in a depression  
between low rolling hills that  
seem to be of glacial origin.  
The soil is full of gravel, raising



from small to small boulders.  
The hills about run up to  
fifty or sixty feet in height.

I walked out across a  
low meadow most of which  
was in a hay meadow. Low  
areas immediately back of  
the tile boomed margin of  
the lake were bare but were  
evidently inundated in high  
water. A hollow place was  
covered with a growth of  
*Cyperus*. That in a casual  
examination seemed to be  
*paludosus*. Large areas of  
dead fox tail were noted  
with *Cyperus*, depressions filled  
with grassy growth were  
common and numbers of  
small circular depressions  
filled with water and many  
strawbed weds were noted.

A few *Smittia longipennis*  
were seen, *Bitteris* were common  
& I saw a few Western Trew  
& parrows.

After noon I took a  
small stud boat belonging to  
Mr. Curran and followed down  
into the Bay south of the club house.  
The water here ran from two  
to four feet deep. The shore was  
lined with a heavy growth  
of *tules* varying from a

were prings to ~~several~~ two or  
 three hundred feet in width. In  
 shallow places were tube islands  
 large and small. Back of these  
 tubes was usually a belt of  
 Scurfs and this the shore.

At the south end open water  
 reared and a Scurf grown  
 marsh extended  $\frac{1}{2}$  mile south  
 to the great Northern Railroad.

At the edges of the tubes were  
 a few dead ducks caught in  
 the stems and a few of these  
 lay in the growths of Potamogeton  
 in open water. I examined the  
 fresher ones to determine whether  
 for not they had been shot. I  
 found the following that I  
 considered had died of disease.

Greenwing teal	4
Coot	3
Wigeon	1
S. S. Bill	1
Western grebe	1
Immature teal	1

Back of the Scurf marsh  
 at the south end was a narrow  
 band of open ground with  
 alkaline soil upon which a  
 dense growth of some halophyte  
 Chenopod was springing up.  
 When pools stood here the water  
 was intensely alkaline. This  
 open area is bounded above

By ~~the~~ a slight rise to the  
 grassland pond marks the  
 high water flood mark. By it  
 and in the grass above it  
 were many signs of birds that  
 had died from two to six  
 weeks ago. Apparently they  
 had crawled deep into the  
 grass from the water &  
 found the following.

intail	13
Spoonbill	3
Mallard	5
Sandpiper (intail)	2
Killdeer	1
Bittern	1

As we saw these birds  
 lay in the grass the vicious  
 animals had destroyed many  
 others.

Bitterns were very abundant  
 in this grass.

Many fish were in the lake.  
 I was told that they were  
 carp.

Toward evening I set in  
 a blind in a point far away but  
 shot nothing. Earlier I got a  
 right & left with a Cinnamon  
 & a grunting.

All members of the club  
 went back to town today and this  
 evening.

There is some violation here.

P. J. The Larceny of Malta got  
at least 25 birds during the  
forenoon & then went out again  
after dinner.  
Was tried & ship, to jet.

October 4, Monday.

A heavy frost covered the grass this morning but the day promised to be clear. After breakfast at seven P. took the small stud boat with bow being oars belonging to Mr. Carruth. Though the sun was shining a heavy fog came in and obscured everything for an hour. All outlines were muddled and distances magnified. Pipits larger than shore seemed large as Fox Sparrows.

In the Bay in front of the clubhouse is a dense growth of Potamogeton that appears to be pectinatus. This extends out from shore for a quarter of a mile or more. It grows in great islands with trails leading around. None of these are continuous but are blocked some or later. There are many coots in this growth.

I followed the shore down toward Woody island landing in several places. The shoreline was a gravel beach five to twelve or fifteen feet wide back of which was a bank from two to four feet high on which was the usual grassy ground.

The waves had retreated in great masses of Potamogeton till along so that it lay a foot deep and in masses two feet high. The waves wear back slowly into the shore.

Woodj Island is irregular in outline and has an area of about three acres. An outline map of it is shown on the next page. The island itself resembles the mainland exactly. The soil is rough and gravelly and the outer branches are of sand and gravel steep in profile with the waves cutting into the humus above the gravel.

The northern half had some growth of greasewood and *Opuntia* or cholla through the grass. It rises in the center about fifteen or twenty feet above the water. On the north east hook or peninsula are a dozen willows and a tiny broad leaved Cottonwood. From these the island takes its name. On the southern lobe in the center are a few greasewoods. On the broader part of the southern section are also a few greasewoods. On the willows were several great Blue Heron nests

And among the greasewoods  
were a number of Canada  
Goose nests. I saw three that  
had not hatched. On the  
southern lobe had been a  
rookery of Common Terns and  
I think of Franklin & Ring-billed  
Gulls also.

On the northern elevation I  
found a few prairie dogs and  
a small buffalo horn was  
picked up.

The mouths of the three  
deeper bays were choked with  
tules. All the bays were shallow  
with muddy bottoms. Back of the  
city shore was a strip from  
ten to thirty feet wide that

was bare of grass except  
in its higher part. *Unhalophytes*  
*Chenopod* were to two inches high  
was springing up in the  
higher part but toward  
the water it was bare.

This marks the flood plain  
around at extreme high water.

The soil was strong with  
black alkali and in places  
a white loosely crystallized  
encrustation of *Sodium bicarbonate*  
had form. The mud in the  
lagoon was fairly deep  
and black with in most  
places it gave off a strong  
odor of sulphuretted hydrogen.

The water in these bays  
was practically stagnant  
and near the bays was  
strongly alkaline to the taste.

Dead birds were common  
and practically all were found  
lying either on the open ~~to~~ <sup>high</sup>  
ground just above the water  
or in the grass immediately above  
it. I went carefully over  
the entire island identifying  
the carcasses found and  
used much care in the  
identifications. A surprising  
numbers of species were  
found. Following is the list.



Eared Grebe	1
White Pelican	2
Great Blue Heron immature	3
Bittern	2
Ring billed gull (adults)	17
Franklin gull (im.)	6
Gulls undetermined	2
Spoonbill	27
Santail	68
Green-winged Teal	125
Gadwall	2
Mallard	1
Ruddy Duck	1
Cinnamon Teal	4
Redhead (adult male)	1
Canada goose	1
Ducks (undetermined)	35
Common Tern	28
Black Tern	1
Coot	1
Wilson Phalarope	7
lesser yellowlegs	45
Ereunetes sp.	15
Little Sandpiper	5
Marbled Godwit	23
Baird Sandpiper	8
Wilson Snipe	2
Solitary Sandpiper	1
Avocet	2
Least Sandpiper	2
Buff-breasted Sandpiper	1
Dowitcher	1
Pectoral Sandpiper	4

115  
34  
4

445

Knot		1	
Snowy Plover		1	
Killdeer		12	
Song birds	undetermined	7	
Yellowheaded Blackbird		1	18
Pipit		1	4
	Total.	468	

(In the case of single individuals there is some doubt as to the advisability of including them in the list just as given here. All these birds lay on the breast usually with the feet under them and the head lying on one side in front. Most of them were immediately in the open but as they had crawled back into the grass. On the open ground (I have of the same) I have seen just birds and most of them that had washed in. It took to be birds that had been shot & had not been picked up.

The carcasses were all old with few exceptions. Many had the short Chenopod and new grass almost hiding them. I take this fact and from the many undetermined birds it would seem that the trouble occurred in the early

part of August containing  
them until they were  
discovered a few days previous  
to the first of September.

Mr. C. F. March showed at  
the Milk River Valley gun Club, tells  
me that this season the  
water in June was two feet  
higher than at present. By July  
the storms ceased and during  
July and August the water  
went down. These months  
were rainless with practically  
no wind. It was during this  
period of stagnation that  
trouble began.

I searched the island carefully  
but could find no live birds  
helpless save one Wilson's  
Snipe. This bird showed  
symptoms of cholera and  
eyes very thin. It could walk  
about but could not fly. The  
wings drooped from the carpal  
joint to the green. I winged dead  
that I thought was affected  
was seen but could not be  
caught.

As this island is cut off  
from the mainland and no  
predacious mammals have  
access to it none of the  
birds have been disturbed.

I brought in skeletons of  
some of the more desirable  
ones to be preserved.

This island seems to be  
right in the direct line  
of flight from the north.  
Two or six hundred Curvace-  
backs came in during the  
forenoon & swung around.  
I saw birds mainly Black-bellied  
Plover & Pectoral Sandpiper were  
passing continually. I shot a  
Harris Sparrow in the clumps  
of the Swallows.

In the afternoon the wind  
came up and when I started  
back about four I had a  
little trouble with the waves.  
The steel boats are too  
small for rough water. After  
starting once I returned to  
the lee of the island and  
covered every thing so that  
it would not get wet. My  
gun, camera & field glasses  
I tied to the boat. I  
did not have as much  
trouble as I anticipated after  
all and was wet only  
by spray splashing over the  
front of the boat. I leaning  
the clubhouse the masts  
held the waves down. Many

Cods & eel webs were gathered  
more to record the ground &  
- but many of the latter -

at the bank house of put  
Mr. J. J. ... whose ... a  
home ... .. He tells  
me that the lake is of  
recent origin. That until  
Beaver Creek was dammed  
some years ago there was  
only a small body of  
water here. Now it has  
run up from ... ..

He said that last year  
the large irrigation ditch  
above ... failed with water  
in about the space the dam  
had cut the water ran out.  
Small pools remained in the  
bottom of ... ..  
said Kellum & this ... ..  
were ... ..

Mr. ... .. that when  
the dam first opened that lake  
water was used in drinking  
& cooking. ... .. had  
been drilled. The water has a  
faint yellow appearance and  
a slight taste that seems ... ..

October 5, Tuesday

This morning the sky was overcast and the wind came down from the Northwest late in it grew stronger and blowing into the North cutting quite cold. It was extremely too rough to get out on the lake. The sun was obscured all day.

During the forenoon I worked at the clubhouse caring for the birds in hand & making observations. After dinner with Mrs. Judson I walked for a mile & a half along the big irrigation ditch below. I hunted several parts of it but failed to note any sick birds or any carcasses. The wind blew a gale across here and a few Horned Larks, pipits & a tree Sparrow were the only birds noted. We returned to the clubhouse along the lake shore. The ground was snow & messy. No chat birds were noted along here at all. There were great growths of Fox tail grass along them. I flushed a few ~~two~~ Abackon Kingstone & a little one.

Returning to the clubhouse I went out again to the

south through a growth of  
Scirpus & sedges the shining <sup>the</sup>  
lake. I watched attentively for  
black ducks but saw <sup>no</sup>  
May there with a <sup>single</sup> in two  
traces.

I shot one large before  
Campylopus and preserved its  
skull. It was a female  
On either side of the anus  
& vagina I found a tan spot  
of skin about an inch in  
diameter. The vagina was on  
a slight <sup>convex</sup> <sup>and</sup> <sup>rather</sup>  
side but its base was a pouch  
like sac with an opening in  
quarter of an inch across. In  
this was a thick oleaginous  
secretion mixed with small particles  
with a strong animal odor,  
two scent glands. The eyes  
were brownish yellow. Anal  
temperature 102.4 F. The animal  
was a few feet only & then stopped  
& was shot. Length 655 mm  
Tail 120 mm. Hind foot 150 mm.  
On the strong wing, inside  
primary about 50 mm

October 6, Wednesday.

Gold and very windy this morning. Waves were running very high on the lake. The sky was heavily overcast and occasional light rain fell that was almost a sheet. I worked from seven until ten in the boathouse caring for the birds on hand. It was very cold and my hands were chilled.

After dinner I went out in the boat and crossed the south bay in shelter of the nose and came in behind Bush Point. It was not practicable to get around the point because of the wind.

The waves washing in here have built up a bar behind which is a lagoon grown entirely with tules. The waves had washed in a great mass of *Potamogeton* filling it up in a windrow in places two feet high. I followed along this until I came to a small open lagoon.

A canvasback I came by & I shot but the bird fell far down the bay. I shot one wigeon & two green-winged teal.



Wilson Snipe & a few lesser  
Yellowlegs were feeding on the  
pondweed in Polansigaton.

Ducks were gathered in  
the vjw lagoon out of the wind  
As they got out I dropped a  
Pintail & a Scaupbill. A sick  
Pintail flopped out into the  
grass & I caught it.

I there were quite a few ducks  
birds living here in a  
space ~~that~~ bordering the edge  
of the lagoon that had been  
flooded earlier. All the birds  
lay on the breast with the  
head ~~and~~ on one side in front  
but under body. Perhaps I think  
these birds not quite full grown  
I shot a distance of 120 yards  
I listed the following.

Scaupbill	12
Green-winged teal	11
Pintail	6
Common teal	3
Gull	2
Mallard	1
Mud Duck	1
Duck not determined	5
Widgeon	1
Lesser yellowlegs	1

I followed down here to  
the point at which I began

To count birds on my trip of last Sunday. Birds were scattered along here in small numbers, all being dead as the others. Between the marsh & the grass, was narrow band of gray flat on which was covered in places with an encrustation of sodium bicarbonate. Along here I found the following.

Spoonbill	43
Greenwinged Teal	41
Mallard	4
Pintail	17
Gadwall	1
Wigeon	1
Ruddy Duck	1
Cinnamon Teal	1
Goose (Canada)	1
Duck not determined	3
Western Grebe	1
Eared Grebe (young)	1
Coot	2
Common Tern	1
Ring-billed Gull	2
Erismeter	6

Many of the Spoonbills were scattered & immature birds. For a long stretch I found only a few birds and I did not count them.

there were a good many  
birds that had washed in  
from the lake in the moss but  
I took no account of them. Many  
birds are crippled or lost here  
in the shooting and the majority  
of these came from this source.  
I found a wing-tipped Spoonbill  
& a Gadwall & many other  
nicks.

The wind was from toward  
nightfall.

October 7 Thursday.

Last night it froze hard  
forming ice in barrels and barrels.  
This morning it was almost  
clear and was still but  
very cold. About seven thirty  
I started down the lake  
for Goose Island. Ducks were  
flying fairly well but not as  
yesterday. A bunch of geese  
passed ... but were out of  
sight.

I reached the island a  
little before nine without incident.  
This island is 125 feet long by  
fifty wide. It is oval in  
shape and has a gravel  
beach all around. Long points  
open and low extend out  
from either end. The island  
lies ~~east~~ north & south  
is general trend. The surface  
of the island is elevated  
four to six feet above the  
water. It is being slowly  
worn away by the waves.

Greasewoods & atriplex  
cover the surface and there  
is one small ~~narrow~~ broad leaved  
Cottonwood. Every where on the island  
are great Blue Heron nests. I  
counted 110 on the water  
island that apparently had  
been occupied during this

past summer. They were  
built up from the ground  
to a height of one to three  
feet or at times were merely  
four inches high. All were  
round. Two feet or more they  
were small and were composed of  
small bits of grass and  
Building material - not at  
a premium in a country like  
this. Sometimes a small  
piece of wood was stuck in the  
foundation, and again the  
nest was placed in the open. Several  
nests were at times placed so  
that they touched. Along the  
beach nests placed in grass were  
frequently four or five feet in  
the air as the soil had  
washed out beneath them. These  
nests were very firm in structure  
and were placed on the beach  
in such a way that they  
blocked the passage around the  
island. These were three feet from  
the ground. On walking down  
the island I stepped on them  
to get by them as many times  
without breaking them down in  
the least. Very few dead young  
were noted. On nine nests in  
the 110 I found pellets containing  
bird feathers. A shell case of this  
was gathered. On this case

These might well be birds  
that had been picked up sick  
or dead along the beach here  
or on Woody Island. The  
great numbers of these birds  
~~being~~ especially the shorebirds  
lying dead this past summer  
might account for this large  
number of nests at which  
pellets were found. Most of  
the pellets were flattened out  
like pancakes and in many  
cases a number had  
merged into one mass.  
A few entire ones were found.  
All about on the ground  
were signs of white pelican's  
nests. The number of their  
chalky eggs were picked up.  
Sometimes these nests were  
placed upon circular spots  
of 8 inches across and elevated  
two or four inches above the  
soil. These were composed  
humus but had originally  
been known nests of white.  
I have heard that large  
numbers of the young pelicans  
had died this summer  
but I saw very few on the  
island.

This would be a fine  
place to collect shorebirds in

their usual & continual movements.  
Narrow Black-bellied Plover, Sanderlings  
& Pectoral Sandpipers dropped  
in every few minutes lighting on  
the sand the points and all  
disappeared rapidly. I shot four  
plovers & a sanderling.

About the beach on one  
end were forty or fifty dead  
Eremias. And a few least  
& Pectoral Sandpipers as well  
as two Sanderlings. I am examining  
these the wind freshened and  
the waves began to run at  
night that I had to leave  
suddenly for fear of getting  
caught.

The small striped water snake  
was seen. Wooded tracks, caterpillars  
as the vegetable matter was very  
abundant here.

From here I crossed to  
Long Island immediately to  
the north and about a  
mile away. It was rough  
for a quarter of a mile but  
then I lost the lee of the  
island and got along without  
trouble.

Long Island is about ~~thous~~  
hundred feet long and varies  
from ten to fifty feet wide.  
There are two small Broad leaved  
Cottonwoods and several small

willows upon it. These willows  
have a grey bark. I cut into  
one thinking that it might  
be the heart willow but was  
disappointed.

The island lies approximately  
east and west. The western  
half rises to a low but  
above the water in the  
roughly humped and the  
western end is low. Near  
the higher part is a growth  
of a tree I can't identify it  
the dense growth of a woody  
stem of a species. There are  
several cypresses about  
the island. I found no  
chickens. There are some  
after examining the island

I built a small shed on  
the eastern end. Wilson found  
green winged teal or possibly  
I came in constantly. I shot  
a pair of waterfowl in the  
marsh, a mule & camp  
& a redhead in the same  
up about a mile got away  
without a shot. Finally four  
Canvasbacks came down and  
were called in by a low  
quack. I tumbled up and  
shot a mule about 1/2 mile  
with my second barrel. A



few minutes later, I dropped  
my gun, making a fine  
pain and was then content to  
stop and eat my lunch.

About two hours to the  
westward was a large bay  
with a small round island  
and a long gravel point  
projecting into it. Ducks  
swarmed out here resting  
feeding & sleeping. Most of  
them were fuliginous species.  
About two thirty I crossed  
to the main land & followed  
the shore back toward the  
clubhouse. I found a series  
of muddy sloughs along  
here formed by waves throwing  
up bars behind the points  
and cutting off small bodies  
of water. One was entirely enclosed.  
Much alkali was found on  
the lake shore back of this &  
the low lying ground was  
swampy.

Along here I picked up one  
sick green-winged teal and  
saw three others. One of these  
I shot but the other two  
escaped. As this deep water  
it is difficult to capture them.  
Also captured two sick  
coots. These birds act

As sick birds close on Blue  
River and spots of partial  
paralysis. The number of  
birds is no longer  
checked in effort  
to save.

In the evening the  
wind shifted to the  
from the north & at last  
decreased.

The wind swung to the  
south at night.

October 8 Friday.

The wind changed to the south  
that night and although it  
froze in the morning by noon it  
had warmed up and was completely.  
I was glad of this as I worked  
on skinning birds and making  
dissections all day in the boat house.  
At first my fingers were so stiff that  
I could walk only with difficulty  
but later it was warmer.

Charlie, state manager of the  
Club and H. N. Palmer, a guest  
were out yesterday in Woody  
Island and brought back a  
large number of ducks. They had  
previously counted sixty I think  
though I did not count them.  
The birds were hung up overnight  
and my estimate of their number  
was made from seeing them at  
a distance. Palmer I do not think  
got over the limit of 20 but I  
know that Mater killed a great  
many more than the limit. He  
did this to supply the table at the  
Club.

The members of this club are  
all honorary game wardens with  
the power to arrest. They do not  
hesitate to shoot more than the  
limit however when they have  
a chance. Their excuse is that  
there are so many days when

They get only half a dozen  
and say that I say I am entitled  
to see them they can get  
them. Walter is not important!  
There are many birds that  
will be interesting in your birds  
which I shall see.

Great numbers of birds that  
are shot are in the field and  
lost.

Mr. Miller says that  
he has the breast bone and the  
spat them down in duck oil for  
winter.

October 9, Saturday.

This morning it was sharp and cold again but warmed up later on. I made up 8 or 10 Blackbird skins and skinned a Spombill a male in full plumage. And then proceeded to pack up. Had an express box and a large box by mail.

Subsistence here at the clubhouse is \$2.00 per day. Transportation in auto to and from Malta \$4.00 for the day. Mr. Palmer went in with me so that it cost us \$2.00 apiece.

We left the clubhouse about two thirty and arrived at Malta at three. I was sorry to leave this country without visiting the Mill River but did not have time for this trip. The broadleaved cottonwoods and other growth should yield other species of interest that I have not seen. The river passes Malta on the outskirts of town and is about four miles from the clubhouse at the lake. The cottonwoods are yellow but still retain their leaves. I had

I had a number of errands in Malta. Bought a new trunk rope, a blanket, purchased a ticket, checked my baggage and had a bath at the Fifth Avenue Hotel a new hotel

... cost me fifty cents.  
I met Mr. Mingo (spelling?)  
and Mr. W. Ellis both old hunters  
in this locality. They have known  
the lake for twenty years.  
Mr. Ellis told me that three  
years ago he had seen many  
dead birds about the lake & the  
... The shooting season  
but will send no attention to them.  
He did not doubt but that they  
had been sick.

Mr. Mingo again on the  
following clipping that he  
had cut from a paper in  
New York, North Dakota and  
sent to Mr. Ellis.

Hundreds of dead young ducks have  
been found along the Mouse River, ac-  
cording to reports brought in by hun-  
ters. It is believed that a malady has  
attacked the young ducks, probably  
brought on by something they have  
eaten.

He thought that it was a few  
miles west of W. H. Paper but was  
not certain.

The hunters here will believe  
that only young birds have  
died but this is not so.

Mr. Harry Cosner told me  
that he has noted a few dead  
birds every year.

I ate dinner with Mr.  
Palmer ?

and then did some writing after  
ward.

Wrote the game warden of North  
Dakota at Bismarck and the Postmaster  
at Minn. for more information  
regarding the sick bird. I wrote Mr.  
E. C. Carver, Deputy game warden at  
Havre Montana thinking him for  
the use of his boat etc. at Lake Bowdoin.

Wrote also a game warden J. L. McKent  
at Helena thinking him for now.  
I told him that apparently trouble  
among the birds had been the same  
as in Utah and that no serious  
need existed no fear of having  
birds that might be affected.

At the beginning of the season  
even a number of the birds  
found in the lake did not  
get them.

Left Minn. at 11:28 P.M. and  
and I sleep.

October 10, Sunday.

Was up this morning at seven.  
Found that we were passing  
through a somewhat rolling country  
with the Missouri River not far  
away.

From Fort Benton to Great Falls  
we followed close to the stream.  
Large cottonwoods fringed its banks  
and willows were abundant as we  
passed near and could see an

Arctostaphylos - buck brush and other shrubs.

Birds life was scarce. One Magpie was seen near Fort Benton.

At Great Falls a light snow mingled with mist came down. I saw the Falls in the Missouri River from which the town takes its name and found them about 30 feet high. Other smaller cascades were below them. A flock of pintails passed over while the train was standing in Great Falls.

Beyond Great Falls the road again followed the Missouri. At Cascade the stream became more narrow being 150 yards wide, with shallow and with a swift current. The water was clear. Magpies were seen at Cascade. A dozen hunters left the train there and I saw several boats containing hunters along the river. One lone green winged Teal was seen and other ducks that was not identified.

The hills through here were pointed and angular. They gave place suddenly to rocky bluffs irregular in outline. The river became more swift with boiling eddies and its track passed through a rocky canyon where



The scenery was wild and beautiful. There was considerably white pine here.

Beyond Helena I saw Englemann spruce. The colors in the vegetation were not so brilliant as when I passed through ten days ago. Snow and rain fell all along, and the mountains were whitened with the first fall of the season. At Butte considerably snow lay in the higher mountains.

At Butte which was reached at 3:55 P.M. I transferred across town to the Oregon Short line depot. Bought a ticket to Corvallis, Pullman to Brigham and rechecked my baggage. Was not able to buy through fare the station at Malta.

Left Butte at 5:05 P.M.

Some snow was falling in Dillon.

October 11, Monday.

Arrived at Brigham 6:22 A.M. Found the morning cold and sharp.

Walked up town, had breakfast at the Booth Hotel made a few minor purchases and then returned to the depot. Wrote the office arrival in Corvallis and then wrote until train time.

Met Mr. Benson & Dr. Dart.  
Dr. Dart is the one man with  
whom I have talked who fully  
agrees with my alkali theory.  
He says that the eating away  
of the mucus lining of the intestine  
could be accomplished only by  
a strong acid or an equally  
strong alkali and that it is  
without doubt due to the latter.  
He said that Mr. Stewart had  
practically given up his acid  
theory.

Dr. Dart is one of the  
junior doctors in Salt Lake City  
having been there 35 years.

Left Brigham 10:20 a.m.  
Arr. Corinne 10:30 a.m.

Sent baggage to the boat by the  
club wagon got my mail  
and then left about eleven for  
the gun club. Arrived about one  
7 and very thing at the laboratory  
in good shape. Spent the afternoon  
in unpacking, etc. Got the  
motor boat to running & everything  
in good shape.

October 12, Tuesday.

This morning finished  
cleaning up and straightened out  
the skins secured at Montana.  
They came through in very good  
shape. Cleaned and unbracketed

In paraffin. The histological material  
secured at Lake Bowdoin. It  
was not completed until nearly  
midnight.

I am sleeping here in the  
laboratory and found the floor  
rather hard the first night.  
The thermometer stood at 30°  
this morning and there was  
a heavy ~~and~~ frost. Later in the  
day it was more pleasant.  
I am told that shooting  
is not so good as it has been  
in other years. This year on  
October 1 only about 175 ducks  
were brought in to the duck house  
while last year over 600 were  
killed. All shooting practically  
is done from sick boxes. The  
Duckville Gun Club now has  
about fifteen out in the South Bay  
and the Bear River Club is using  
them also. I was told that  
the best shooting was all far  
down in South Bay. The greater  
number of ducks that are secured  
down there are S. Spoonbills. Few  
Mallards and Pintails are taken.  
The men shooting from the  
mud boats have by far the  
best of it. As shooting from  
shore blinds few birds are killed.  
The shooting in East Pass

is not good at all. Very few birds were killed this on the first.

I am told that the hunters are staying within the limit of 50 birds i.e. twenty-five for themselves & twenty-five for the guides very closely. When they want more they take out another guide. They seem to be afraid. Even some who before have paid no attention to the law now bring in no more than 25.

One case of shortage of ducks at the clubhouse either for sale or to supply members guides are sent out to shoot. They are allowed their time for doing this and the ducks are purchased by the guides at the usual rates. October 13 Wednesday.

It was somewhat warmer this morning and promised a storm but cleared up later in the day. Early there was quite a fall of dew. I walked up along the willows and looked over my duck pen and they went on up for a short distance. No birds were seen in the willows at all.

I am told that a member  
of the Bear River Club shot one of  
my tame Redhead in front of  
the Duckville Gun Club while it  
was sitting in the water though  
men yelled at him telling him  
not to shoot it. That must be  
great sport for one who is  
shooting ducks for the excitement  
that there is in it.

I made a number of  
dissections etc this afternoon.  
Secured the heads of a white  
fronted goose & two Snow geese  
this morning at Sackett's. They  
had five bands for me and  
as Sackett said that he had  
mistaken another.

This evening I was  
invited to dine at the Bear  
River Club and went up about  
at a quarter of six remaining  
until nine.

I met Mr. J. C. Neely, Mr. Painter,  
Mr. Culbourn, Mr. Currie, Mr. Porter,  
Mr. Sanborn and one or two gentlemen  
whose name I did not recollect.  
They entertained me very  
courteously and I spent a  
most pleasant evening. All seemed  
much interested in my work.  
Mr. Neely and Mr. Culbourn  
were especially interesting letters.

Mr. Nuby asked me if I expected to ~~require~~ be here next year and I said that I hoped so and he remarked that probably a new <sup>or</sup> ~~approach~~ <sup>approach</sup> would be necessary and that he thought that he could do his share toward getting it.

From Mr. Morgan at the Duckville Gun Club I learned that Steve had been a few six ducks at Red Rock Lake in southeastern Montana near Monica during the summer.

Yesterday I noted that Bert Bailey at the Duckville Gun Club had turned in 50 ducks while Harry Finch had 56 to his credit. They had been when the shooting was very good but I think killed no more.

Oct 14, Thursday.

This morning I note that the water gauge at the laboratory registered 2 ft 3 3/4 in so that the water level is about as it was on my departure.

The willow leaves are beginning to fall somewhat now and most of them are yellow. Numbers of geese are using the flats in front of the laboratory as a roost in the daytime.

Oct 15, Friday.

Today it was still warmer than yesterday. I spent the entire day at the laboratory in completing various odds and ends of work. Had opportunity of making a few anatomical notes on a snow goose.

Secured several bands from the Bear River Club.

The shooting here continues about as before. The variations over the limit that I see are very slight.

Having so many about mine my system of note taking has many visitors.

October 16, Saturday.

This morning it was cool and pleasant while later in the day it became quite warm.

I bailed out my rowboat and about 8:30 I towed it behind the launch out 3 1/2.

I went out No. 3 and then lost the cut off into 3 1/2.

Four Bluebills came up No. 3 and passed directly over my head. I saw a dozen Redheads in 3 1/2.

To my disgust I found that some one had torn my water gauge from the post on 3 1/2. Can you not imagine why it should have been done.

The water on the flats here was about as I had left it. East Pass and Pintail Neck are now full and because of the filling of the bays the overflows are a little deeper though the river is about the same. In other words the current or fall in them is less apparent. This is especially true of No. 1.

Below Slaughter Island the water seems more shallow than during September. Perhaps the low level of the lake



has drained. The lower bay  
somewhat. I found on duty  
as far as Slughter Island.  
The water has come up  
along the west shore as far  
as ~~Long~~ Bigelow's Point but  
on the east side does not reach  
the rushes. When blinds have  
been built along the west shore  
but on the east side the  
shooting is entirely from sink  
boxes. I understand that the  
Duckville gun has 15 or more  
now.

The Bear River Club is  
placing sink boxes in North Bay  
also. They are making them  
of planks and calling them  
part of them are sink blinds  
two + 1/2 feet deep and have a  
rush island built up about  
them.

Here Slughter Point I  
remained for over an hour.  
A small amount of new  
growth was showing among  
the dead rushes. The mud  
at the south side had the  
same wet smell of N<sub>2</sub>S as  
always.

The mud queen had taken  
Bailey & Dick Rogers down below  
Cable's Island and I could

hardly making them out in the  
haze, but just and then  
lost them. They were at  
least two miles ~~through~~ south  
of Ladies Island. The mud  
boat left me man in a box  
and then started across to  
another. Before they had left  
the first hunter two minutes  
I heard him begin to shoot.  
It is said that the  
Spoonbills come directly in to  
the boxes without fear.

Two men were shooting  
from a box directly ~~in~~  
southwest also. The gunshots  
from sink boxes have a  
singular reverberating quality  
that distinguishes them at  
once from shots fired in  
the open.

heading S. Langley Island  
I have pushed up as far as  
S. Langley Point assuming  
the Scripps Island as I  
went for sick birds without  
discovering any. There was  
an enormous bank of  
Spoonbills and a few teal  
to the southward perhaps  
two miles and shooting  
down that way was continuous  
I reached Slaughter Point  
at noon and concealing

My boat went into the  
blind to eat my lunch. A  
few birds were coming in  
and I remained until four  
thirty getting one Mallard  
one Gadwall & nine teal. Three  
other ducks were shot & lost.  
A California gull ate one  
Spoonbill for one and two  
Wigeon drifted away.

A man in a suit boat  
in front of me had fair  
shooting of the birds I am  
in well to him. Shooting all  
over the marsh was almost  
constant. The birds on the  
water pay no attention to it  
whatever, strangely enough.  
Morgan got 60 birds  
today.

October 17, Sunday.

Warm and pleasant again today. Packed up a great quantity of mail packages and got them ready to send off. Was busy but this parking practically all day. I wanted to go down & examine the Blackbird roost but did not get time. There is a great flight of them every evening now.

I made the accompanying chart of the grounds here today. This eastern end of Section 25 is cut by the river making two loops south of the river that are under fence. I should we get control of the the most southern it could be fenced across easily to shut out cattle. This area was fenced originally to make a pasture for Davis cattle. He has cows in it now and they come down about the laboratory causing some annoyance. Most of the fuel lies in the next bend above so that fencing this area would cut off my little pasture. The shortest distance across is 35 yards. A more feasible spot for fence lay a little south of this through a

Small open spot of alkali  
The length of a fence here  
would be 25 yards. The expense  
of fencing would be that of  
wire and staples. Posts could  
be cut in the willows.

I am uncertain as to the  
exact area involved. The  
distance along the river is  
400 yards. The area included  
lies between the river and the  
fence. I should say that it  
covers between two & three acres.

This morning I walked up  
along the willows finding the  
most abundant birds to be juncos  
Six were collected.

October 18, Monday.  
Today it was still and warm again.

I continued my packing and preparations for leaving. There are so many little things to do that it takes a great deal of time.

I sent a gunny sack full of packages to Corning today and got a great many more ready.

Wallace Jensen told me that eight years ago he picked 9,000 ducks at the Bear River Club and that others picked 6,000, a total of 15,000.

I have figures now that on the shoot there last year that at the Dunroville Gun Club that are fairly accurate.

Carl Olsen received \$97 for the season's work and Mrs. Hansen who remained a few days after the season closed \$110.00.

20 geese were picked at 10¢	\$2.00
about 50 Redheads & canvasbacks @ .05	2.50
	<u>4.50</u>

\$97 + 110 = \$207. \$207 - 4.50 = 202.50

\$202.50 ÷ 1 1/2¢ (price for picking ducks) = 13,500

so that 13,500 ducks were picked. Counting birds shot and taken away unpicked and birds shot by quacks & picked by them.

The total birds which reach will  
over \$15,000 for this one club.  
Figures for Sackett's and the  
Pagan River Club are not available  
but it is safe to say that it  
is not far below this. Counting  
miscellaneous hunters it is safe  
to say that not far from  
50,000 birds were destroyed last  
year on this one marsh.

To this number may be added  
one third as representing birds  
crippled & lost or birds that  
were killed and not found bringing  
the grand total to 65,000 birds.

Examined a number of ducks  
wings today to determine for  
certain that they are *drastotaxii*.

October 19, Tuesday.

Worked today all day at packing up.

~~Was~~ started this morning I got out at 4:30 and went out with Si Knudson to try for geese but got nothing. The geese roost on the lakeshore here and about seven in the morning begin to fly inland where they rest and feed on the open flats. In hunting them hunters watch them and find out where they are feeding as the birds will return to the same location each day after day for a week or more. They in the morning early it is the practice to go out set out some shadow traps made of galvanized iron. The hunters then dig a pit in the salt grass or lie down flat in the salt grass and wait for the geese to come in. The best locations are those where barrens come with growth of *Salsomia* large islands of salt grass dotted over them. This morning two other hunters beat us to our location and we had to get in to one side. They got five but all but one were killed by guides.



In the evening I had dinner  
at the Bear River Club. Met a number  
a gentlemen among them Mr.  
Mohler. We dined on rare  
Carovastack.

I worked until shortly on  
my return getting every thing  
straightened up around the  
laboratory. Cleaned up everything  
took off the screen door and  
put it off inside, swept out and  
pulled all the curtains down.  
Backed a warning sign on the  
door to the effect that the  
building was the property of the  
Department of Agriculture.

I have buried off a narrow  
strip of grass on either side of  
the building. All the pens are  
piled together on the open barrow  
where they will be safe from  
fire.

October 20. Wednesday.

Was up this morning at  
5:30 and left on the boat at  
6:15 for Corvallis. Arrived it  
8:15 and by strenuous effort  
made the train. Left a forwarding  
address at the post-office and  
sent in a raft of mail packages  
microscopes and microtomes were  
sent in by express in one box  
valued at \$350.<sup>00</sup>.  
left Corvallis at 9:45 and

after changing at Brigham,  
arrived in Ogden at 11:00.

I learned from Frank Larson  
that last year Fred Shurman  
shot and sold 3,000 ducks an  
average of fifty birds a day  
for two months.

In Ogden I went to the  
bank and there had an  
amalgam filling placed in a  
tooth. Spent the afternoon in  
writing Registered at the  
Marion.

Felt pretty tired this evening.

October 21, Thursday.

This morning I went in  
to Salt Lake City on the electric  
line. Left at 10:00 and arrived  
at 11:00 A.M. Went in to see  
Mr. Chambers but found that he  
was not in. All state offices  
are in the new capitol. This  
is a fine building and I  
spent a few minutes in  
walking through it.

Had lunch at Finch & Rogers  
cave and talked for a time  
with Mr. Finch thanking him  
for courtesies extended by the  
Gun Club.

Went in and saw Mr. C.  
Griffin. He says that there  
is no trouble at the new

Stab and discouraged  
from going out <sup>there</sup>.

I find that a trip to Oasin  
will not pay. Talked with  
Mr. Wrathall, taxidermist. He  
does very good bird work.

Went in to see Mr. <sup>A.O.</sup> Soregange  
but found him not in.

Left for ~~Butte~~ at Ogden at  
three and arrived at four.

I have ordered a new  
suit here and have bought  
new shoes etc.

The valley is very pretty here  
now. The poplars and cottonwoods  
are yellow and when there  
are peach trees the leaves  
have turned a beautiful red.

As always the diversity of  
the country is pleasing to the  
eye after a sojourn in the  
great flats.

October 22 Friday.

This morning I rose at  
six and then took the  
Southern Pacific for Remonting Point.

It was clear all day  
and warm almost too  
warm in fact. First I  
filled a jar with orange  
juice and forwarded it  
express to the survey. The

It is very rocky nearly  
every where or sandy. In  
some places however I found  
a greyish ooze rather sandy  
in consistency. I am afraid  
that it is pounded on the  
rocks too much to contain  
either *Rematocis* or *Oratons*.

When you great quantities of  
the algae of *Noctua* sp. washed  
in here.

After doing this I walked  
back along the east side  
of the promontory. There was  
hardly any gulls here  
this year. I saw one flock  
of about thirty gulls gathered  
on the beach. On examining  
the locality with a glass I  
found that a spring issued  
there and that the birds  
were drinking the fresh water.

*Chrysothamnus* was in  
bloom as at this time  
last year.

I walked out through  
the sage brush for some distance  
watching for *Amphispiza* but  
saw none.

Several swimmers have appeared  
up at this end of the Promontory  
range since I was here last  
year and there is considerable  
swimming excitement.

I followed up the first  
canyon until I came to  
the spring. The season shows  
that it is farther advanced  
here than last year. The leaves  
are nearly gone from the  
maples. These maples grow  
here in places twenty or thirty  
feet tall and have a girth  
of six inches to a foot.

Birds were more scarce than  
last season. I ate my lunch at  
the spring and various  
birds came in to drink. Junco  
were common and among them  
I identified both means & b  
& Shufeldt's Junco. A little flock  
of Goldfinches came in and  
Chickadees were common.

From here I followed on  
up to the top of the ridge, catching  
grasshoppers. Two species were  
common. One had yellow & blue  
marked wings and the other blue  
wings. They lay all through  
the sage brush and on up  
through the juniper to the divide.

The ground high up was  
rough and stony. The yellow  
& black species was active and  
individuals always jumped when  
I struck at them so that they  
were easily caught. The  
blue winged form was

quite many let me pass  
without flying and when  
I struck let them they  
usually crouched and remained  
motionless so that they  
were hard to get. It  
broke the handle of my net  
& tore a hole in the bag.

In flight they made a  
buzzing zit zit zit zit.  
On alighting they dropped  
off to one side in the last  
six or eight inches & was  
hard to locate.

The jumps up here were  
large. I saw some fifteen  
inches through. With them  
were trees of another species  
with ~~an~~ elongate shiny  
leaves a climber like the  
shrub <sup>(Centropus leucogonus)</sup> taken. Another  
plant I grew over rocks forming  
a dense hanging mat  
showing outwardly a solid  
mass of rosettes. (*Petrophyton caespitosum*)

Reaching the top of the  
divide I decided to go  
down & return on the west  
side. The distance was  
much greater than I had  
supposed being at least  
fifteen miles. I passed down  
through a valley ground with

Sagebrush and finally came out  
on the lake shore. Several rocky  
points now a hundred feet or  
more above the water level of  
the lake were polished smoothly  
by water. The polish appearing  
as fresh as things just done  
in places. The shore line was  
sandy and a drum had  
been thrown up by the waves.  
The only bird seen was  
one Horned Lark. I shot a  
large chipmunk <sup>Amnosp. pennsylvanicus</sup> <sup>leucurus</sup> saw  
another. <sup>Amnosp.</sup> made into skeleton.

Out for fifteen I reached a  
flag station known as Salina and  
got a train at 6:15 for Ogden.  
The lake was beautiful  
this evening in the soft  
colors reflected in it by the  
sunset. The water was  
bald with a slight  
swell that did not break  
the apparent smoothness of the  
surface. The sky above set first  
was olive green with deep  
purple clouds. Gradually it  
darkened with a rosy hue  
that tinged the waxy peaks  
Hemont, Antelope and Stansbury  
Island stood out as dark  
purple masses.  
The evening air was clear.  
Reached Ogden about 7:15 clear.

up had dinner and then  
went to bed.

October 23, Saturday.

Was rather foggy this  
morning and did not go  
out in the country. Had  
enough official correspondence  
to busy me during the  
forenoon and worked in notes  
sent for in the afternoon.

Ed Browning had a new  
eye type of ejector put in my  
collecting pistol and it  
works like a charm.

Made an appointment with  
Mr. Chambers in the evening  
but his train got in so late  
that I did not see him.

Very warm today, almost  
uncomfortable in fact. I  
thought once of putting on  
B. V. D's again.

In the evening Mrs. Van  
Meter invited me out to the  
Alhambra (Vanderbilt) with the  
Bigelows.

October 24, Sunday.

This morning about 8:30  
I went out in the country  
following up the Weber River  
as far as East Ugdyn.

It was a fine clear day  
with a light north wind  
giving a sharp edge to the



Air. The cottonwoods have turned yellow but still retain most of their leaves.

The Weber is about as high now as in the spring. The current is swift and the water clear. Many leaves are carried by the current now. I saw small fish in deep pools.

Birds were plentiful. Long tailed Chickadees were common. Junco of the Oregones & hyemalis types abundant and I saw a sprinkling of Robins, Flickers, Magpies Goldfinches and others. The new jacket on my jacket works to perfection. The gunsmith who did the work repaired certain rough spots from the barrel and the gun seems to shoot stronger than before.

I saw several Eutamias but could not collect one. I wanted one for a skeleton.

The day was so pleasant that I delayed the thought of returning to town.

Month October 11-28, 1915

Amount available at beginning of period	351.04
Total expenditures	<u>141.62</u>
Balance	209.42.

Food Habits	Cash expenses Oct.	48.72
Duct Disease	.. .. .	74.17.

May 6, 1916, Saturday  
Left Washington 7:35 P.M. on the  
Ber D for Chicago quite warm.

May 7, Sunday.

Was up this morning as the  
train came into Youngstown, Ohio.  
Leaves on the trees here were not so  
far advanced as in Washington. In  
most of the grove there was merely  
a tinge of greenish brown from opening  
buds in the tree-tops. Symphoricarpos  
was in full leaf as was Cralagus  
in the pasture. There have been  
heavy rains all through here; the  
grass was fresh and green from the  
abundant moisture and water was  
standing everywhere. West of Akron  
vegetation was farther advanced  
and leaves showed in the tree-tops.  
Saw some oaks that were leafing out.

In several places I saw  
muskrat houses in little swales  
~~not~~ from 30 to 40 feet square that  
were not connected with any stream  
I was surprised to note them in  
such small quarters.

Red-wings were fairly common and  
I saw numerous Sparrowhawk, Meadowlark,  
Crow, Robin and Mourning Dove. Heard  
a pair of sparrows singing.  
Saw one very large Mascula -  
Thurber. Chrysomys were common.

At Willow Creek Indiana when  
the train stopped for a few minutes I  
heard a mockingbird in full song and  
saw a cowbird, several English Sparrows  
and heard a yellow Warbler.

Near Gary, Indiana we passed  
through a sand dune region with  
alternating sandhills and small ponds  
and swamps, lying south of Lake  
Michigan. This area was interesting  
because of the work done here by  
Chicago naturalists. In several places  
I saw growth of low scrub pine.  
The road ran immediately along  
the lakeshore for some distance but  
I could see little because of a haze  
that hung over the water. The  
 breeze from the north was cool and  
fresh.

Reached Chicago at 4:40 P. M. Grand  
Central Station. Transferred to the  
Hearborn Station. Left Chicago via  
the Santa Fe at 6:00 P. M.

May 8, Monday.

A heavy storm passed over last night.  
This morning outside Kansas City I  
heard numerous Dickcissels singing  
as always here.

Vegetation seems much farther  
advanced than it was at Washington  
though of course ~~the~~ it is two days  
later than when I left. This

country and in fact eastern Kansas  
seems dry and in need of rain.  
left Kansas City at 9:10 and arrived  
at Lawrence at ~~9:40~~ 10:22 on the  
Santa Fe. Scott H. & family were  
there to meet us and we were soon  
out in South Lawrence.

Saw Scott Grisco at noon and found  
that he would be able to join me at  
Corinne on Thurs. He seems pleased  
at the opportunity for the work.

Went to the University at 1:30.  
Bunker told me that Vic Householder  
had gone to Southeastern Kansas to do  
economic work on the cotton rat, heard  
nothing more concerning the status of  
the animal.

Called on Mr. Noble Sherwood at  
2:00 and remained with him until  
4:30. He told me that two or  
perhaps one or two more of the sick  
ducks from Great Bend had been  
brought in to the University frozen  
for examination and that work had been  
done on them by Professor Clausen and  
two students. As I talked with  
Professor Clausen also, the following  
is a composite of information gained  
from ~~them~~ both these men. The ducks  
were said to die frozen in in the "  
ice with" heads under their wings.  
Careful examination revealed no lesions  
in the internal organs except

possibly in the spleen. The intestines  
seemed normal. Professor Clausen  
remarked however that he was not  
familiar with the appearance of  
Duck viscera when normal. On  
skinning the birds they found  
hemorrhagic lesions between the  
skin and the body in several  
places. The species of duck examined  
was not known to those who did  
the work. Professor Clausen found  
in these hemorrhagic lesions an  
avirulent organism and succeeded  
in isolating it also from brain,  
liver, spleen and kidney. That the  
organism found appeared avirulent.  
Thus far inoculations made from  
cultures had failed to prove positive.  
On fact the cultures seem wholly  
innocuous. However from this form  
they seemed capable of inducing  
an encephalic trouble. Prof. Clausen  
admitted that his results were  
tentative and such that only the  
examination of further material could  
tell whether he was on the right  
track or not.

Dr. Sherwood was much interested  
in my account of conditions at  
Great Salt Lake. He after careful  
consideration said that apparently I  
was on the right track in suggesting  
a chemical poison as the cause.

Although the ocular discharge  
might indicate some septicemic  
condition still this same discharge  
might be caused by something else.

He gave me suggestion that caught  
my attention when he said that  
Magnesium sulphate was very poisonous  
to dogs in which there was a  
previous severe intestinal irritation.  
So that administering Sodium  
chloride followed by Magnesium  
sulphate might prove fatal. Examination  
of nerve centers controlling wings &  
legs might prove fruitful also.

While at the University I  
called also on Professor Baumgarth,  
and Mr. Haworth. I put half an  
hour in the museum  
looked up the type of Fornicarius  
monilegis pallidus Lawrence. This  
is indicated as the type specimen  
on a list prepared by G. H. Lawrence  
himself. On the same list  
Leptoptila fulviventris is  
indicated as a type but this  
specimen has never turned up.  
I think myself that it was  
destroyed by moths. I remember  
fragments of such a specimen in  
some of Mr. Brown's cases.  
All seemed very good to be  
about the museum and the  
campus again. She went across

Wakarusa valley as always was beautiful.

Shortly after five we drove out along little Stranger Creek and back ~~some~~ supper in the country. Our tour ~~was~~ is at present a great host of geometrid larvae attacking the newly leaved lins. The tender growth in some trees has been entirely eaten away and other trees have limbs or perhaps the entire top almost stripped of verdure. The larvae hang down on long threads and creep on pedestrians. The sidewalk is littered with them. English Sparrows were feeding on them greedily. A Saw Robin, Baltimore Oriole, Rose breasted Grosbeak, and Bronzed Grackle eating them. Other birds noted in the infested treetops were the yellow-billed Cuckoo, Yellow Warbler, Tufted Titmouse and Brown Thrasher. This is a very interesting thing and I wish that I had more time to watch it. Birds are very abundant in the rows of shade trees lining the streets and I believe are attracted here by this abundant food supply.



May 9. Tuesday.

This morning was up at 4:30 and met Charley Burkler at 5:00. He drove out in a Hupmobile and we did some collecting. First we turned down past Reynolds and then down the little body of timber near ~~Hedekump~~ on the Wakarusa. There are myriads of birds in the tree and struts of the town. At daylight they were especially noisy. The old tangle of hedge and brush below the "Dog farm" had been nearly all cleared away. In a little corner of it I collected a Yellow and a Black and White Warbler. Rain threatened for a time but soon passed over.

In Armstrong's timber the cater worms were at work on the newly leaved elms. Their webs spun long and slender threads being everywhere catching on my face and clothing. Many of the small trees were being stripped. I learned that they had appeared about two weeks ago and that they had been steadily growing worse. Birds abounded there in this patch of timber and I believe that most of them were feeding on the worms. 21 birds were collected for their stomachs. These taken were Kingbird 1, Orchard Oriole 1, Dickcissel 2, Clay-colored sparrow 3, Field Sparrow 1.

Bell's Vireo 4, Tennessee Warbler 4, Yellow Warbler 1,  
Black & White Warbler 1, Wilson's Warbler 1, Chickadee 1,  
Ruby-crowned Kinglet 1.

Other species common were the following  
arranged somewhat in order of abundance.  
Cowbird, Baltimore Oriole, Catbird, Crested  
Flycatcher, Red-headed Woodpecker, Brown  
Thrasher, Wood Pewee, Least Flycatcher,  
Chat, Red-eyed Vireo, Bobwhite, Crow,  
Hairy Woodpecker, Rose-breasted Grosbeak  
Cardinal, Yellow-throat, Yellow-billed  
Cuckoo. These birds were very  
active in the tree tops where  
the birds were abundant.

I was very sorry that I did  
not have more time to spend here  
as three or four days could be  
passed profitably in studying  
the birds in relation to this  
insect outbreak. It was with  
reluctance that we returned to  
town at seven.

The country here is beautiful  
and green but is in need of rain.  
The sun early in the day was intensely  
hot.

In town I packed my suitcase  
again and prepared to depart.  
Had time merely to sweep once  
in the grass of the back yard. Several  
small Hymenoptera, Diptera & flea-bettle  
etc were collected. I secured two  
*Megilla maculata* but did not preserve

them. A few brownish colored things  
were in the suit. Last night I got a  
few more from a buffalo head.

~~learned that~~ left Lawrence via the  
Santa Fe at 10:22 purchasing a  
ticket to Great Bend Kansas.

Met "Bud" Burt of culinary fame in  
the Acacia House on the train and  
had a pleasant visit with him.

His brother Lloyd Burt of Hutchinson  
Kansas who was with him told me  
something of sick ducks near Ellinwood.  
He said that great numbers were reported  
dead but knew nothing more about it.

The country from Lawrence west  
seemed sadly in need of rain and vegetation  
was less advanced than at Lawrence.

Burt said that the country along  
the Rock Island near Burlington was  
famous for flocks of Blackbirds in the  
fall. Dickcissels were heard as far  
west as Emporia. Birds seemed  
rather scarce.

Reached Great Bend at 7:20  
and registered at the Hermann Hotel.  
Very hot with a warm wind  
tonight.

May 10, Wednesday.

Was up this morning at 6:30. ~~Had~~  
It was my plan to get out early  
and go over along the Kansas  
River to see what birds were about.  
During the night a severe wind storm  
came culminating about day break  
in a gale in which the air was  
filled with sand so that I  
remained in. After breakfast I  
walked down to the river where  
a new cement bridge crossed it.  
The stream was shallow with  
a broad sandy bed through  
which ran a narrow channel  
of fair, clear water. Cottonwoods  
grew along the stream every where.  
Because of the wind few birds  
were in evidence.

Yesterday it was uncomfortably  
hot so that I sat in my underclothes  
while writing but this morning  
I found that the wind had  
shifted to the north ~~and~~ bringing  
a bracing coolness that was  
very agreeable.

About 9:00 I called on  
Mr. C. D. Spangh, 1203 Main Street a grocer.  
The sportsmen of Great Bend have  
organized a gun club known as the  
Great Bend Sportsmen's Association and  
have leased the hunting privileges for  
the western side of the Cheyenne Bottoms

There they have a clubhouse and other buildings. Mr. Spangh is president of the organization about 40 members now. Mr. Spangh said that there had been a good many sick ducks on the Bottoms. Pintails were the species most affected with a few green-winged teal and shovellers. ~~But~~ the Bottoms the water on the east side is shallow while on the west it is deeper. The sick birds were all found on the east side in the shallow water. Only a few birds were noticed until after the freeze in January when many were found. Probably thousands. Mr. Spangh admitted that there were sick birds and believed that the trouble was due to their crowding in shallow water. He had seen very few sick birds personally.

Some others believed that the birds had died from lack of food but he hardly thought this possible.

A cyclone passed through this region on November 10 and some said that this had killed many ducks.

For four or five ~~days~~ years it has been very dry on the marsh but last year water filled it again.

Next I called on Mr. Charles Herrman proprietor of the Herrman Hotel. Mr. Herrman would not admit that there was any disease among the ducks. He attributed the dead birds

found to cripples from shooting. The cyclone also passed through the marsh going between Clafin and Redwing and this in his opinion killed many ducks. Mr. Herrmann has three Pintails and several mallards that were brought in from the marsh. The mallards are laying.

He said that last year he killed about 50 ducks. He favors spring shooting until March 15. He says that in most seasons the marshes are dry in fall and only in spring is there water to attract ducks. Very few ducks were found along the Kansas River. The gun club has the shooting privilege on the bottoms for the next four years.

Following this I saw Mr. E. W. Seward a barber. Mr. Seward was very conservative and well informed regarding the situation. He had seen many of the sick and dead birds. He said the birds became so that they were unable to fly or perhaps could fly only a few yards. These birds were pitifully thin and emaciated. He had noted no discharge from the eyes or nostrils and said that in birds fresh caught that the feathers about the anus were clean. He brought in twenty-two live birds but all of them died save two. These two he thought were

cripples. He said that all the birds were found on the eastern side of the bottoms. He thought that many of those found frozen in bunches in the ice had been washed in by the wind.

He introduced me to Mr. G. E. Dirks a photographer. Mr. Dirks had seen the birds on the eastern side of the bottoms and was convinced that for a large part some disease was working among them. He told of seeing birds drop out from flocks in the air but this I do not believe. However he showed me a negative by Mr. Geo Klein of Ellinwood in which 52 ducks could be seen. He said that he would make me a print of this. They found numbers of birds frozen in the ice after the freeze up in January. Some lay with outstretched necks others had their heads under their wings and were sitting up frozen solid. Sick birds had the feathers about the anus stained with excrement.

Here too I met Mr. Clyde Moore who had looked into the matter after the freeze up. He substantiated Mr. Dirks' remarks. Ducks were said to have been frozen into the slush ice in numbers. As a common name for the Buffle head he gave "Brogey". a

Names by which these ducks  
were known to the market hunters.

With him I met Mr. C.  
M. yes registers of checks but learned  
nothing additional.

Called on Mr. S. M. Killam  
clerk of the court a very dogmatic gentleman  
and with him met Mr. R. C.  
Russell County attorney. They  
thought the number of affected  
ducks greatly exaggerated and  
were not inclined to believe the  
trouble a disease.

All of these men were arguing  
for spring shooting for the month  
of February at least and all  
seemed to have a dislike to Holland.  
They said that he had misrepresented  
statements made to him and had  
published accounts in which he  
had belittled this information.

He told me too that Geo. J. Klein  
of Ellinwood was well informed but  
that he was given to exaggeration in  
talking. Klein has a place at the  
edge of the bottoms and captures  
water fowl to sell for propagating purposes.  
It is said that he has cured some  
of the sick ducks with fresh  
water and forced feeding. He lives  
16 miles from Great Bend.

From information it seems  
certain that some disease broke



out among the water fowl perhaps  
in November. Numbers of ducks  
mainly Pintails with a few Mallards,  
Shovellers and Green-winged teal died.  
Others were weakened so that they  
were unable to withstand the  
severe cold of a January freeze.

Certainly over 1000 ducks were  
lost probably two thousand or three  
thousand. The trouble terminated  
in January or early February.

Nothing is known of it this spring.  
Under the circumstances I  
do not consider it worth the  
time and time expense necessary  
to make the trip out to Cheyenne  
Bottoms. The high wind of yesterday  
continues and I am told that  
this would make travel in  
the marsh difficult because of  
the waves. The Bottoms are said to  
be approximately 6 miles wide by 12  
miles long. There are no springs the  
only water reaching them being  
surface water from heavy rains. This  
floods the entire area. As it subsides  
smaller lakes are left. The bottom is  
said to be muddy and covered  
with marshy growth. On some  
summer the water is covered  
with aquatic growth.

About three I walked down  
to the Arkansas River and crossing

it went east along the South  
Bank for a mile and a half  
collecting a few insects and watching  
for birds. Along the stream were  
willows and groves of cottonwoods.

This whole country here is  
under cultivation and is in  
to wheat. I did not see  
any unbroken prairie land while  
here at Great Bend. Along the river  
I cannot to see two or three  
sandy knolls five or six feet high  
that were covered with low  
plum brush and grape vines.

But this was the only sign  
of original vegetation outside of  
the willows and cottonwoods.

This great change from original  
conditions must have created  
a great influence on the bird and  
other animal life of the region. Species  
accustomed to a prairie habitat would  
in certain cases become extinct. This  
would without question influence the  
longspurs and probably the Horned  
larks. Birds were fairly common  
however. I found few insects.

The country in which I was  
collecting was too dry for them.

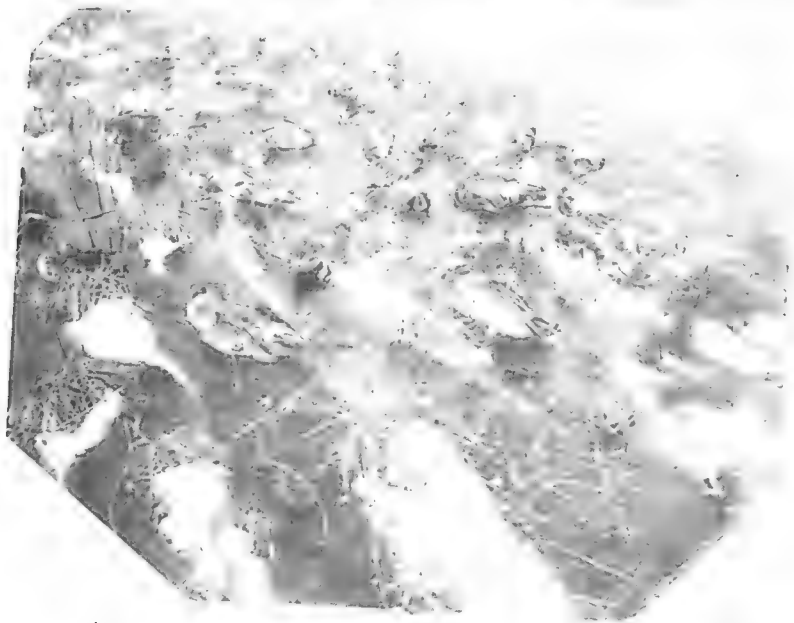
Returning to Great Bend I purchased  
a ticket to Ogden Utah rate \$27.05.

Mr. G. E. Dicks the photographer  
gave me two prints from a

negative of dead birds on the  
Cheyenne Bottoms. This photograph was  
taken by Mr. Geo. Klein of Ellwood.  
As it then are supposed to be  
52 dead birds. These seem to be  
Pintails and a few Mallards; nearly  
all seem to be drakes. From the  
positions in which they lie they  
seem to have drifted in here by  
the wind and then to have  
frozen in the ice. Mr. Dicks said  
that they had been frozen in some  
heavy ice which had thawed  
releasing them and these subsequently  
had been flooded. The birds were  
frozen in the upper coat of ice.

Mr. Dicks said that at Redwing  
there was no hotel but that I  
could without question obtain  
lodgings ~~at~~ with Mr. Brockel a  
prominent man there. This town  
would be a good point from which  
to work the marshes.

Mr. Dicks said that the Kansas  
sportsmen objected to men in the  
State south of them shooting during  
February while in Kansas they were  
prohibited from hunting. He said that  
if they might have until Feb. 15  
they would feel better about it.  
Left Great Bend Kans. for Denver  
at 7:25 via the Santa Fe.



Dead Pintails and Mallards on ~~western~~ side of Cheyenne  
Bottoms at Great Bend Kans. Feb. (?) 1916. Photo by Geo J. Klein, presented by  
A. C. Dicks.

May 11, 1916, Thursday.

Ate breakfast this morning at Colorado Springs. Afterward I called up D. P. Warren. He is planning a trip to Cheyenne Wells, Colorado to observe bird migration. He wanted me to stop but of course that was impossible.

Between Colorado Springs and Denver I saw numbers of Magpies. One Crow was noted near Sedalia.

Reached Denver at 10:00 a. m. checked my baggage, secured a Pullman berth for Ogden and then went over town.

Found that R. B. Rockwell had set up in business for himself. But took me out to the Colorado Museum in his car and I met the Director Mr. J. D. Figgins. I found him a tall spare man with dark hair and mustache and a very pleasant manner. The groups of birds and mammals that have been installed which small are excellent. The synoptic series seemed to me rather weak. The old cases in vogue when I was here were changed entirely. Fred Lincoln was in Arizona so that I missed him. Had a pleasant talk with R. J. Medrath.

again and Chambers promised to send another man to investigate. Now Bigelow has directed Vince Davis to throw a fence across the marsh from the River at the head of No 4 across to the lake near Swiford's Point.

May 13. Saturday

This morning I was up at 6:30 had breakfast and left for Salt Lake City at eight. The air was sharp and cold and the atmosphere was very clear. The morning sun threw the Promontory Range and the islands in the lake in bold relief. Fremont and Antelope islands stood out sharp and clear above the blue water of the lake. Beyond them to the south was the Ogden range with snow still in its peaks. ~~The~~ fields and orchards showed evidence of the heavy freeze of a few nights ago. Peas were frozen to the ground. Ryeplant was withered and many fields of alfalfa were severely affected. Leaves on some shade trees very hard been frozen and I was told that nearly all of the fruit had been ruined. Birds were abundant along the trolley line. English Sparrows and Robins predominated in the fields.

And other species were often in sight.

There was an abundance of water in the Weber River and elsewhere. Water was running in small streams. Snow lay in banks on the peaks of the Wasatch range.

And Salt Lake City first I purchased supplies at Schramm-Johnson, Drugs, Min & Meltin Supply Co and then the Durbin Surgical and Dental Supply Co. Called on Harry Finch. He has recently been at the Duckville Gun Club and reports things in good shape. There is an abundance of water everywhere. He says that calves of large size have gone down with the fresh water close to Judy's Island. I asked him about the cattle on the marsh and he said that he saw few. He says that Sackett asked to lease the section belonging to the Duckville Gun Club that he might pasture cattle on it in exchange he would grant a right of way through his land for ~~the~~ channel of no. 4. Davis also wishes to lease the eastern half for pasture but says that he will keep the cattle off until after the ducks were through nesting. Finch decided that it was better to keep out of it.

He said that Davis had asked him to help in preventing S. Kitt from running a large herd on the marsh.

Finch was out on the lake about a week ago and visited the rookeries. Large numbers of California gulls and Pelicans and a few Great Blue Herons nest on Nat and Garrison's Island. On a small rock at the north end of Antelope Island were Cormorants and large numbers of G.B. Herons. No Caspian Terns. All of these birds had eggs and a few of the Pelicans' eggs had hatched. The gulls destroyed large numbers of Pelican eggs when the pelicans were frightened away. He saw one sick pelican, an adult that was unable to stand.

Arranged to rent two rowboats of the Duckville Gun Club at \$5.00 per month. Payment is to be made to W. J. Benson Treasurer.

Called on Mr. Chamber's office (State Fish and Game Commission) at the Capitol but found that he was out of town. His secretary told me that Davis had reported 300 to 500 head of cattle on the Bear River marshes. James Kunder Deputy Warden was sent up to investigate and after talking



with Bosdy, Cook and Sackett reported no more cattle than last year.

Called at the office of Mr. L. B. McCormick and found that he was out of town. After dinner I called on Mr. M. G. Kuyser but found him out also. Had some necessary dental work attended to purchased more needed supplies and then left for Ogden at 5<sup>00</sup> P.M. Arrived at 6.15

The air was sharp and cold tonight. Called Joe Cook on long distance and arranged to have him meet me in Corinne Monday morning.

May 14, Sunday.

This morning at 7:30 I went up Ogden Canyon with W. H. Neal. We left the Stubby car at the Lime Kiln and climbed up Coldwater Canyon. The air was sharp with a cold wind. When occasional clouds obscured the sky it was very cold. In the afternoon heavy clouds swept across the sky and from then until five there were occasional flurries of snow. At the mouth of the canyon the vegetation was practically out but at about 8200 feet the highest point that we reached buds were barely starting. Between these points was a gradual

Transition from summer to the  
earliest indications of spring. Even  
these hardy mountain shrubs and  
herbaceous plants showed the effects of  
the severe frost and freeze. Solomon's  
seal was withered in many places.  
Service berries and mountain maple  
were touched and higher up many  
of the willow blossoms had been  
blasted.

*Berberis* was common and in  
blossom. A sunflower like plant,  
Solomon's seal, service berry were blossoming.  
High up a beautiful yellow *Dodecatheon*  
was in full blossom and was  
scattered every where where the ground  
was free from snow.

Because of the cold few insects  
were found. A black thrips (*Frankliniella*)  
was common in the flowers of all the  
plants. I collected a few Carabids under  
bark and rocks in moist localities. In the  
afternoon a warm valley bathed in sunlight  
for a few minutes gave me one *Bremus*  
one *Andrena*, one *Urania* and one *nomada*  
at willow blossoms. Some veld flies were  
secured here also. Had the weather  
been better these willows would have  
yielded much more.

Birds too were scarce. Above  
7500 feet in the coniferous growths I  
did not see one. Below were a  
few Virginia's warbler and an

occasional Ruffed grouse. The only  
bird taken was a small Empidonax.

The higher slopes had been  
logged off until only trees of  
small growth remained. The slopes  
here were exceedingly steep.

Sometime during the winter a  
great snow slide had swept down  
through the canyon clearing everything  
before it. Conifers and Mountain  
Maples ten inches through had  
been swept down and broken  
off short. The bottom of the gulch  
was filled with snow packed  
hard as ice. The debris left by  
that portion already melted  
covered it until it seemed like  
solid earth. Everywhere its surface was  
covered with pine needles.

Mountain maples grow here to  
a height of fifteen or twenty feet  
and are ten inches through. I  
saw ~~one~~ few mountain mahogany  
(*Cercocarpus intricata*) about 6,000  
feet. Kinnikinnick in places grew up  
two feet high in long fronds.

There was an abundance of water  
in Ogden River.

Shot one Citellus and found a dead  
coyote.

May 15, Monday.

This morning I left Ogden on  
the Oregon Short Line for Corinne, Utah at  
9:30. The air was still sharp.

but it was much warmer than yesterday. Changed cars at Brigham and arrived at Corinne at 10:30.

I found that my microscope and alcohol had not come on the train though I had seen them on a truck at Brigham so that we had to wait until the Kelton local came. On this they arrived.

Saw Mr. Clarence Adney in Corinne.

Bought various needed supplies in Corinne. an ax, etc. gasoline has gone up to 30 cents per gallon.

Hired Ray Bosley for the season as field assistant at \$50.00 per month and board.

Joe Cook was up in the launch to meet me and after dinner in Corinne we started down the river. Our load was big and very heavy but we got along without any trouble.

Left Corinne about 1:00 P.M. and reached Duckville about 4:00. Stopped en route at Fred Hansens.

There were about the same number of ducks on the river as last year on my first trip. I counted the following pairs

Pintail 3  
Spoonbill 6  
Mallard 4  
Commons 7  
Gadwall 16

Green-winged Teal 2.  
Canada Goose 1

At the Duckville gun club I found  
everything in excellent condition. At  
the laboratory a bottle of distilled  
water and a bottle of so-called  
Carbolic acid had broken during  
the winter. Everything else was  
as I had left it. The acid smell  
permeated the entire building.

Numbers of wasps and flies  
lay dead on the floor. I  
was interested in noting that  
the curtains down all winter had  
faded out in the strong light  
to a pale green.

We got things unloaded from  
the boat and under shelter but  
did not make any attempt at  
straightening and arranging as  
it was too late in the evening.

Es Sackett came up in the evening  
and I arranged with him to do  
some carpenter work for me. Have  
planned to build a six foot "slope"  
on the west end of the laboratory.

We figured the lumber for it this evening.  
Mosquitoes were quite bad in  
the salt grass. I hung the screen  
door on the laboratory first thing that  
I did.

The grass is still brown on  
the flats and all vegetation is far  
behind what it was last year when  
I arrived (May 19). The late season  
will account for this. I think too

that the willows have been affected  
by the freeze of the last few days.  
The river is running at about normal  
high water.

May 16, Tuesday.

Was out this morning at 6:30.  
Thermometer  $36^{\circ}$  the morning was  
clear but in the afternoon it became  
hazy and clouded up. There is a  
storm brewing. I expect rain in about  
two days.

Worked at the laboratory until  
about three o'clock and got everything  
unpacked and put away and  
the building swept out and  
cleaned. The floor was covered  
with dead wasps and Blue bottle  
flies. Set up the stove pipe and  
got the stove in shape for cold  
weather. We will need heat from  
time to time until the middle of June.

About three we went down  
 $3\frac{1}{2}$  in the launch. The water was  
swift and deep but there was  
hardly as much water on the  
flats as I had expected. We  
got down as far as the first  
island and there was bare  
ground for some distance below us.  
There is not as much ground  
under water here as when I  
came two years ago. I believe that  
the two dry seasons have made

in building up the bays by drying out the high portions and making them more firm. The vegetation that has started also has ~~started~~ helped render these parts firm.

From the ranch I counted 8 horses and 60 head of cattle below Sackets. In addition 8 young calves are feeding opposite the laboratory.

All vegetation was very backward along here. I saw only one willow that was beginning to throw off cotton.

Between the gun club and the first island in 3 1/2 were the following pairs of ducks.

Mallard	2
Gadwall	3
Cinnamon Teal	15
Redhead	16
Spoonbill	3.

From my observations of this year I am convinced that migration among the small land birds here in the mouth of Bear River is much later than I had supposed.

Evidently they are just beginning to come in. The Kingbirds have just arrived and are not yet common.

They must reach this region from the north, following down Bear River. None of the small

Empidonax are here yet and the  
Warblers have just come.

Spent the evening at the laboratory  
in straightening out my notes.



May 17, Wednesday.

Temperature at 6:30 a.m.  $52^{\circ}\text{F}$

This forenoon I worked at the laboratory on notes and on official letters. Have every practically ~~as~~ arranged and in order in the way of supplies. Went ~~of~~ over the lumber bill for the addition to the laboratory and also figured on lumber for additional experiment pens. Packed up some insects and miscellaneous material to send in.

After dinner Joe Cook and I went up to Kunda's in the launch. Cook keeps a Ford run about there at Kunda's and we went in to Corinne in it. The distance by road is about twelve miles and in this manner of travelling there is a great saving of time. We reached Corinne at 1:45 and went directly to the lumber yard. Ordered lumber and similar needed supplies. It will cost more to paint the laboratory than I had figured. At least three gallons of paint at  $2.50$  per gallon and two quarts of white lead will be required.

I bought 70 rods of barbed wire in Corinne for fencing and various other supplies.

On the return we stopped at the Chesapeake and I met the Superintendent of the grounds Mr. Miller

The gun club there owns about 1800 acres of ground and has leased the shooting privileges on an additional area. Formerly Woods' Creek ran down through here ~~from~~ and emptied into the eastern end of North Bay. About 15 years ago Mr. Harvey organized the club threw a dam across Woods' Creek and in addition by purchasing this property from the Sugar Company secured waste water from the Bear River Canal. This with the water from Woods' Creek filled a large area making a shooting property. At ~~low~~ high water from Woods' Creek took out the dam several times until finally a ditch was dug through surplus from it into the river again.

At present water at the dam is 32 inches deep and about 1800 acres are flooded. This water is 3 or four feet deep in the middle during shooting season the water at the dam is lowered to 16 inches this makes a supply of food accessible to the shallow feeding Ducks.

The lake then covers about 1000 acres.

Much warmer today.

May 18, Thursday.

Thermometer this morning stood at 52°. Much warmer during the day. The sky was overcast all day with rain threatening.

Cook went in to Corima to stay with the big launch and the flatboat after lumber. I sent Bosby along to attend to lumber that is coming down for me.

Mosquitoes are quite bad now. In the morning I went up along the willows for an hour or so. Found a small flock of Lark sparrows and Chipping Sparrows that are evidently migrants. There are a few Indigo Bunting and Pileolated Warblers in the willows. Heard the first yellow throat singing today.

Collected three young magpies and worked on them until noon.

This afternoon I made out my expense account to date and then made an estimate of running expenses until July 1 so that I might know where I stood in the way of available money for incidental expenses.

Towards evening fixed up the water gauge. Figures on it had been nearly obliterated during the winter. The gauge at 1 ft. 7 in. The water

has gone down 3 inches since Monday. During the spring water stood at the 1 foot mark on the gauge for a long time as it was well cased in mud. At some time strata had stood at 5 1/2 inches.

Cook and Bosley came with the lumber about seven thirty. A storm was brewing so after dinner we unloaded the flat boat finishing the work about 11:20 P. M.

Bosley made the following count of ducks seen between the laboratory and Corinne.

Gadwall	22 pairs
Common Teal	78 "
Spoonbill	21 "
Mallard	14 "
Pintail	2 "
Ruddy Duck	1 "

This count was made in the forenoon which may account in part for increase over min.

May 19, Friday.

Water gauge 7:30 a.m. 1 ft. 7 inches.

This morning first thing we checked over the bill of lumber. Found one or two things short and some other matters that will need straightening out. Made out a form 5 vouchers for the entire amount that I may have it ready when I go to Corinne.

After dinner we went down Channel 1 in a row boat.

About three it began to rain and we returned. I noticed a

peculiar phenomenon in regard to rain that I have seen here often before. Storms with rain extended clear around us shrouding little mountain The Promontory Range, the islands in Great Salt Lake, Willard Mountain and the Wasatch in mist and rain while in the center of the valley with the mouth of Bear River, as a center there was no precipitation. Often I have seen these storms clear off with no rain here at the laboratory at all.

The water now in Great Bay is not much higher than when I came last year though there is about five inches more water in the river. The vegetation and in fact the entire season seems very

backward to me.

The following pairs of Ducks were seen  
between the laboratory and Pintail  
Neck on No. 1:

Cinnamon Teal	10
Spoonbill	1
Redhead	6
Gadwall	2
Pintail	2
Mallard	1

The nest of a mallard containing  
11 eggs was found.

There is a great colony of  
Avocets and quite a few stilts  
down here.

No sign of sick ducks. I  
have heard that there were quite  
a few sick Bluebills on the Chesapeake  
this spring. would ~~surely~~ attribute  
the trouble to lead poison.

Backitt on whom I am depending  
to build the addition to the laboratory  
phoned me that he could not be  
here until Tuesday.

May 20, Saturday.

Water gauge at 8:00 a.m. 1 ft.  $7\frac{1}{2}$  in.

This morning we went out Channel  $3\frac{1}{2}$  in the launch and then down along the west side of South Bay as far as Laughlin Point. Last night there was a heavy rain up the valley. This morning the wind was northwesterly and was cool. The sky was overcast during most of the day.

Between the laboratory and the mouth of  $3\frac{1}{2}$  the following pairs of ducks were seen.

Pintail	1
Common Teal	21
Redhead	12
Gadwall	3
Mallard	1
Spoonbill	1

This will serve as a check on the count made here previous to this.

From the mouth of  $3\frac{1}{2}$  I worked straight down the west side of South Bay. There is a broad band of Cat tails here ~~the~~ alternating with growths of *Scripus*. At high water this is all flooded. Now there are small pools from a yard or two to several hundred yards wide and runs and leads of water all through. This is a great harboring place for

Ducks. Between the mouth  
of  $3\frac{1}{2}$  and Slaughter Point I saw the  
following pairs of ducks

Redhead	120
Canada goose	13
Green-winged Teal	13
Ruddy Duck	5
Pintail	13
Cinnamon teal	20
Gadwall	9
Mallard	9
Spoonbill	12

A few Pintails and green-winged  
Teal were in small flocks on the  
bay and one flock of 4 drakes each  
of mallard and Spoonbills were seen.  
These birds are not settled yet and  
were ignored in the count. From a  
blind below Bigelow's Point I counted  
68 pairs of Redheads in sight at once.  
Potamogeton was out an inch  
or two long.

I found one muskrat house  
that was  $3\frac{1}{2}$  feet tall and six  
feet broad. another was 3 feet ~~broad~~  
tall six feet broad and 12 feet long  
It formed a long slope with  
the highest point on one end.

There were many sandbarling  
and Black-billed Plover on the bay.  
This is the first time that I have  
seen the former here.  
We lunch on Slaughter Point.



I collected one male Redhead  
here and plucked it for use  
as an alcoholic. Was surprised  
to find a claw on the pollen.

*Pana pipiens* was seen in the  
marsh and I found a few  
tadpoles.

Chironomids were abundant  
but there were few mosquitoes  
down here. I saw mosquitoes  
bite young Great Blue Herons several  
times.

Found no trace of sick ducks.  
Though the water in the  
river is higher than last year  
at this time, there is more  
mud exposed in South Bay  
by far than when I came  
last year. This must be due  
to the fall in the general lake  
level. This fall would drain  
these flats much more rapidly.  
The river current is strong  
and as usual is heavy with  
finely divided sediment.

May 2<sup>nd</sup> Monday.

Thermometer at 6:30 A.M. 40°+

The forenoon was clear but cold. After noon the sky clouded and was alternately cloudy and clear until 6. In the evening the sky cleared but a cold north wind blew that was piercing. In the laboratory I lighted a fire in the evening.

So Sackett came at 8:00 A.M.

and we began work on the store room for the laboratory.

The building was up ~~ear~~ for the rubberoid roofing and the window by dark. It had if built 6 feet wide and two feet deep. It has one small window and a large door. The underpinning is strong and the building will make a convenient storeroom. Boots clothing and miscellaneous matter that now covers space in the laboratory may be put out here.

Worked here all day.

Sackett tells me that he is running 93 head of cattle on the marsh now. Between 30 and 40 are herd cattle that he is keeping for others. In addition there are eight head of horses. He will bring down water milk cows later on.

May 23, Tuesday.

Temperature at 6.30 A.M. 40°.

Rather cold and disagreeable until noon. Then it warmed up somewhat and a curious heavy haze filled the valley obscuring the mountains. It seemed to threaten rain but nothing came of it.

Numbers of Cliff swallows and a few Violet green Swallows were about the laboratory in the morning. Bosley shot two male Purple Martins in the morning.

The storeroom was completed today and the doors hung. I put the new screen door purchased this spring on the laboratory. Shifting the stool me to the storeroom.

Bosley tarred the joints over most of the roof on the laboratory.

Sacutt worked until two P.M. and then left for town. He had some work haying at Honeyville and will finish for me when he returns in a few days.

Cook went in to Corinne this afternoon and brought out the mail.

May 24, Wednesday.

Temperature this morning 40°.

A strong wind came up during the night and continued during the morning until after noon.

Until 10 there was a cold driving rain and during the forenoon the temperature did not rise above 46°. Heavy snow fell on the

Wadatch range and when in the evening the sky cleared the peaks were white down to about 8000 feet. Willard mountain was beautiful.

and immediately after sunset it stood out bold and clear with all the gulches and canyons sharp cut and strongly defined. The summit was white with snow while across the whole ran the zigzag band light in color that I can tell marks an exposure of quartzite.

About nine I went out in the rain to see what birds were moving; the appearance of a female *Dendroica inaequalis* and scattered *Pitohui* and *Dendroica warblers* in the willows in front of the laboratory windows seemed to indicate a migration wave. Though the wind was driving the rain across the flats in sheets, in slicks and hip boots I was

was warm and dry - saw  
when the wet put in on the  
back of my hat between cap and  
slide!

As regards to small birds,  
I was disappointed. A few Audubon's  
Warblers, an occasional yellow and  
Pileolated and a stray Empidonax were  
the only birds in the willows. Stray  
Snow Terns drove across the  
skyline and two were collected.  
Olbis and Nigrit Terns beat back  
and forth and pairs of ducks  
drove across the birds in the  
river seeming to enjoy the chilling  
weather.

Until noon there was a  
steady movement of swallows  
down the river toward the flats.  
98% at least were male *Zachyrista*  
*t. lepidus*. An occasional Cliff Swallow  
and straggling Purple Martin made  
up the rest. They came in  
small bands of half a dozen to twenty  
five, driven by the <sup>south</sup> wind to  
skim along the surface of the water  
between the willow lined banks  
or to beat along behind the  
protecting fringe of brush on the  
north shore. & winging back  
and forth across the salt grass  
mud rising more than twenty  
thirty feet in the air I thought

there was no end to them.  
Hundreds passed in all bound  
for some haven in the great  
flats below.

These birds all showed bodily  
depression due to the cold and  
also probably to lack of heat  
giving food. Body temperatures of  
2 male Violet green swallows registered  
103.8° and 106.8°. A female Dendroica  
zigustera 105.4, a female Dendroica  
auduboni 105.6. In the evening  
two Purple martins registered ♂ 104.8  
♀ 105.0. Other temperatures would  
have been recorded had not a  
wing tipped martin snatched the  
end of my thermometer in his bill  
while I was collecting before noon.

About three the sun shined for  
an instant or two and the Violet green  
swallows martined by the slight  
began bathing by dipping into  
the tops of the swallows on the  
river. As each one struck with  
a plainly heard splash he  
submerged the entire under half of  
his body and his head, while  
his wings were held high above his  
his back.

Toward evening all these  
swallows returned, and hawked  
about for a time high in the  
air or later swimming barely above

the grass. at dusk in little  
flocks they sought the shelter of  
the willows, to roost.

I worked on notes and specimens  
at the laboratory all the afternoon.  
Am putting up numbers of small  
birds as albatrosses.

Wool fixed up my newfangled  
today in final shape and I  
put in a little time in trying it  
out.

Intensely cold in the evening.

May 25, Thursday.

40° This morning the thermometer registered  
at 6:30 and the air was  
very sharp and cold. The sun  
shone during most of the forenoon  
but in the afternoon a strong  
wind came up from the north  
and it was exceedingly cold  
so cold in fact that I had  
to kindle a fire.

In the forenoon we went  
up the river and out Brown's  
Overflow with the new launch.  
The boat worked very well though  
it made heavy work of towing  
a rowboat up stream. The  
water gauge on Brown's Overflow  
registered 2 ft 8 in. There was  
an abundance of water on the  
flats and the bay was well  
filled. Returned via Kunda's No. 2.

On Brown's Overflow <sup>of Kunda's</sup> I counted  
the following pairs of ducks.

Mallard	7
Cinnamon Teal	19
Redhead	5
gadwall	3
Pintail	4
Greenwing	4
Widgeon	1
Spoonbill	6
Total	49

Very few ducks are on the



bay. The few that I saw were  
in the backwater on either  
side of the mouth of the Clufflow.  
In the afternoon I worked  
at the laboratory. Among the things  
I weighed eggs of Marsh Wren,  
Magpie, Common Noddy, Spoonbill and  
Killdeer.

May 26, Friday.

Thermometer at 6:30 a.m. 46° +  
Water gauge 1 ft. 1.10. The river  
current ~~is~~ swift now and  
the water is gray brown with  
a fine sediment. Much mud has  
deposited in spots that were  
hard and sandy last summer.

The early morning was  
beautiful today. The sun was  
shining and the air seemed  
milder than for several days  
past. Lines of swallows sat on  
the telegraph wires, in the  
sun while others circled about  
over the flats. I saw one fine  
male Louisiana Tanager.

Vegetation seems really to be  
starting now. Yesterday I saw  
Scirpus americanus in blossom  
and Distichlis spicata is becoming  
green. New growth is starting  
in the Phragmites and Bulrush  
clumps.

A cold wind blew most  
of the day and in the evening  
it rained heavily up the valley.  
On the evening the mountains  
to the east stood out clear  
and beautiful. The evening  
sun before it sank turned Willard  
Mountain a dull red brown seen  
for its snow covered top. A

few minutes later when I looked  
 again the sun had gone and  
 the steep slopes showed deep  
 purple in the growing dusk.  
 After breakfast we went up the  
 river with the launch and went  
 out Kundsen's No. 1 or "Pilla's" to  
 North Bay. Conditions here were  
 about as they were on Brown's.  
 There is an abundance of water  
 here and the flats are all well-  
 covered.

On ~~Brown's~~ Kundsen's No. 1 I  
 counted the following pairs of Ducks.

Pintail	4
Common Seal	9
Gadwall	7
Mallard	1
Redhead	6
Blow-nosed Seal	1
Green-winged Seal	2
Shoebill	1
Total	31

The Redheads are attracted  
 here by a long stretch of shallow  
 standing water that is fairly deep.  
 As on Brown's there were few ducks on  
 the Bay.

On return stopped at Kundsen's.  
 In the afternoon I worked at the  
 laboratory, making dissections weighing  
 eggs, etc.  
 Put up a two chambered bird box in evening.

May 27, Saturday.

Temperature at 6:30 a.m.  $46^{\circ}$ +

The day was clear and bright all day. A south wind tempered the heat making it more pleasant than otherwise. After breakfast we went down Channel 2 in the launch and then in the rowboat crossed into east Pass and followed down through the Rat Trail into Klondyke. At Klondyke we came out into the willard & pursued east of the long point at Klondyke and then came around into South Bay.

I followed up the east shore past the sunken Scirpus roots making the site of what was Hadley's Island and then up past Davis Island around Mud Point and so into the mouth of Channel 2 again.

Though No 2 carries considerable water it is filling in fast and save at high water has little importance as an outlet of the river to the Bay. In 1914 it was an important branch of the river and its mouth was broad and open. Now it has built down and raised its banks until it extends half way across what was open Bay. Its mouth on the east is narrow and very

shallow. It was just possible to get out with a boat. The western branch channel  $2\frac{1}{2}$  - is about the same. So the westward between Mud Point and Doc's Island is a shallow mud that nearly cuts off the portion to the east from South Bay. The mud here is hard and firm due to the baking that it had in sun last summer. Drying the flats has a great effect in raising them above the water level. They become firm and hard and when flooded again do not soften as before.

A strong current came down East Pass and travel was easy. The Rat trail is a crooked passage barely wide enough to allow a boat to pass but is ~~so~~ ~~is~~ in places three or four feet deep. Such passages lead into shallow lakes and pools and the Rat trail finally spreads out in the Klondike region and is lost in great shallow reaches of water. Along East Pass are growths of Bulrushes but in the Klondike region where the saline content of the subsoil is greater there are replaced by Scirpus. For over a mile back from the Willard Spring salt water blowing in has killed the Scirpus. Along the channels

that are filled with flowing water  
 is a narrow band of green when  
 the plant growth has been enabled  
 to recover. Elsewhere the dead  
 stub rise blackened and leafless.  
 Large areas have been submerged  
 by the rising lake water and  
 the short stems projecting from  
 the leafless belts are found out  
 a mile or more from the present  
 short line. In places they are  
 under 8 or ten inches of water.  
 Many masses of roots attached  
 by runner roots have washed  
 loose and are piled up  
 along the shore. Some of these  
 bunches are the size of a bushel.

Ducks were abundant  
 all through here. From the head  
 of No. 2 to its mouth I saw  
 the following pairs.

Cinnamon Teal	14	
Redhead	10	
Mallard	2	
Pintail	3	
Gadwall	2	
Spoonbill	2	Total 33

From the mouth of No. 2 down  
 east Pass and back up the east  
 shore I saw many more.  
 The region here is peculiarly suited  
 to them.

Redhead	200 pairs
Common teal	45
Mallard	12
Pintail	4
Gadwall	16
Spoonbill	11
Green-winged teal	4
Buddy Duck	4
Wigeon	1
Total	<hr/> 297

Redheads were enormously abundant and were in sight constantly.

Down at the edge of the salt water the south wind was blowing in Ephydra larvae and pupae and a few brine shrimp. Redheads, a few Bluebills, Avocets and thousands of Northern Phalarope were gathered to just upon them.

A mosquito with a very irritating bite was common on the salt flats of Klondike.

Leaving Klondike with a moderate south wind I hoisted a hunting coat on a boat paddle and a camera tripod and ~~then~~ sailed nearly to Davis Island. From there we rowed in into the mouth of Channel 2.

May 28, Sunday.

Temperature 52° water gauge 1 ft. 8 in  
at 6:30 a. m.

Last night was warmer than for  
some time with a true feeling of spring  
in the air. There was in consequence  
a great wave of migration among small  
birds. Yellow Warblers were suddenly  
common. Many Audubon's and  
Pileolated Warblers were flitting about  
in the leaves and I secured a  
Macgillivray's and a Lutescent Warbler.  
It was warm and pleasant all  
day.

I worked at the Laboratory all  
day long on material secured yesterday.  
Put up a lot of ovaries from female  
shore birds last night that I might  
have them for comparison with early  
fall migrants. The sexual organs of all  
the *Phalaropus* were enlarged.

I secured a Pinon Jay in the  
willows this morning.

In the evening I dined and  
cleaned up and then worked at the  
laboratory until 9:30. Am getting  
behind with my notes.



May 29, Monday.

Temperature at 6:30 a.m. 54°  
Today was clear and hot all day with a moderate breeze from the south. About 8:30 we left the laboratory with the launch and went down the Reely canal and then went down the old river channel in the rowboat. There was a very strong current down the ~~river channel~~ canal and the canal was deep throughout its length. At the mouth it had filled in the river channel for some distance but below the water was deep. Aquatic vegetation was starting but was not enough advanced to impede the progress of our boat. Today we followed clear down to where the channel broke up into minor runs and finally reached South Bay to the west of Slaughter Island. Great clumps of round Scirpus grow along the reach of the channel and Bulrushes in clumps were abundant. For a long distance the channel is bordered by growths of salt grass with great alkali barrens on either side. Clear down this is replaced by a clear stand of Scirpus

americans. At present this growth stands ankle deep in water. The lower part of this marshy region seems more protected and warmer than that above. As consequence vegetation is more advanced. Even the birds have felt the influence of this warmth as yellow headed Blackbirds here had young in some cases large enough to leave the nest. At the laboratory they are nest building still.

In the lower growth of Scirpus shallow pools 6 inches to a foot deep were common and channels led all through the marsh some were four or five feet broad others were hidden in the vegetation save for little arched runs. In all was a good current of water setting into the bay.

Carp were common all through here and were spawning. We caught one or two.

Four Western Grebes followed down ahead of the boat and with a pair of Ruddy Ducks were captured alive in the narrow channels.

Ducks were abundant. For the first mile of the channel

They were wild but below was  
 more tame. The following pairs  
 were seen.

Pintail	8
Mallard	23
Cinnamon Teal	29
Spoonbill	8
Gadwall	12
Redhead	36
Buddy	15
Bluewinged Teal	2
Total	133

One flock of ~~two~~ twelve drake  
 Mallards was seen, and another  
 contained 7 male spoonbills. These  
 I believe are birds that have  
 come in here already from the  
 uplands. The season is more  
 advanced up along the foothills  
 and these birds may have bred  
 & hatched and the males now  
 come down here. Jim & Otis  
 told me over the phone tonight  
 of seeing a female gadwall with  
 young several days ago. Even  
 today I saw two female pintails  
 that from their actions had  
 young hidden in the grass.  
 No drakes were in evidence.  
 I left ~~at~~ the bay at 4:00  
 and reached the head of the  
 canal at 6:00 in fifteen minutes  
 more was at the laboratory.

Today I captured a Coot  
with but one leg. The other  
seemed to have been cut off in  
~~some~~ a steel trap. I would give  
little trouble in trapping of  
muskrats if the traps were set  
under water but when the  
coots return in the spring  
trappers give up in disgust. I

May 30, Tuesday.

Today I worked at the laboratory all day. This morning at 6:30 the temperature was 42°. water gauges 1 ft. 7 1/2 inches.

Sackett came in the afternoon and did some work on the window casings.

I ordered 100 lbs of Barley and 100 lbs of wheat from V. F. Davis.

May 31, Wednesday.

Temperature this morning 6: 309.7-  
46° water gauge 1 ft 8 inches.

Worked all the forenoon on monthly  
expense account and accompanying  
reports.

Finances are as follows:

Booby salary Mary	26.67
Tom S, Lowe, Hardware	6.20
.. .. Shaw, lumber	67.50
Transportation requests	68.13
Cash expense	<u>152.01</u>
	320.51

Authorization \$ 575.00

Expense to May 31 320.51

Available to July 1 254.49

Sackett came this afternoon  
and finished my work here for me.  
I worked with him for most of the  
afternoon putting ceiling on the laboratory.  
He charged me \$9.00 for 2 3/4 days  
work which was very reasonable.

I had intended to start  
painting today but the sky  
was cloudy and overcast with  
rain beyond Little Mountain.  
It was very chilly toward  
evening and a heavy storm covered  
the Wasatch mountains.

June 1, Thursday.

This morning the sky was  
heavily overcast and the air  
was very damp. The mountains loomed  
up through a dull haze and  
for a time I thought that it  
was about to storm. Toward noon  
the wind shifted north and  
the sky cleared but it became  
very cold.

I worked on correspondence  
until noon and then Cook  
and I went in to Corning. We  
went to Kimbain's in my launch  
and then took his auto and  
went on in. Made the round  
trip in about four hours and  
had plenty of time. It was  
very cold riding.

I had two boxes of salted  
skins and two packages of stomachs  
that had been packed this  
morning and a quantity of  
other mail. Straightened out my  
lumber bill with Shaw and  
certified to my may expense  
account before the Postmistress.

Across from Nansin's there  
is a large field with considerable  
grease wood in it and above  
Frederickson's was more. I  
collected two Lark Buntings here.  
Booby cleaned out the

laboratory in good shape  
today



June 2, Friday.

Temperature 7:00 a.m. 48°. Water gauge  
1 ft. 9 in.

Clear and warm all day today.  
This morning I mixed up paint  
and started Bosley on the Laboratory.  
Am painting the building a very  
dark slate. Fitted the window in  
the storeroom also.

In the afternoon I worked on  
notes and specimens in the  
laboratory.

V. J. Davis came down and brought  
me a sack of barley and one of  
wheat. With him was Mr.  
Fallon of the Utah Power & Light Co.  
who was canvassing possibilities for  
a power line down here. I told him  
that I could use 3 drops and  
a double connection on the table.  
Probable rate will be 10 cents per kilowatt  
hour with a minimum of charge  
between one dollar and two fifty.

This is also talk of a  
macadam road down here to cost  
\$40,000. I'd have an idea that  
this will go through and when it  
does it will mean a great increase  
in hunting as the marsh will  
be more readily accessible.

In the evening I went up  
to the Bear River Club and called on  
Mr. Davis. Talk was mainly about

Chucks, the marsh and hunting  
Mr. Davis said that so far as  
shooting was concerned last fall  
was the poorest season in his  
remembrance. Members of the Bear River  
Club got comparatively few chucks.  
They did better at the Duckville  
Gun Club as the men there are  
in the main younger, ~~and~~ can stand  
and will undertake longer harder  
trips.

When asked his opinion of sink boxes  
he agreed with me that they  
are a bad thing. That shooting  
from them makes the ducks scarce.  
I said too that it broke up  
regular lines of flight and gave  
the ducks no place where  
they might rest. And ducks must  
have a place to rest or they will  
forsake the marsh. Again hunters  
will get birds this way that  
would be safe from them otherwise  
and this tends to diminish game.

Mr. Davis added that he did  
not consider the half boxes concealed  
in rushes so bad.

He told of canvasback remaining  
all winter about a pond made by  
damming a warm spring near  
Honeyville.

Mr. Davis came down here first  
about 1880. Tom Brown, Geo Davis and

others came down at that time  
in a sail boat from Corvino and  
usually anchored in Brown's overflow  
(from which the overflow received its  
name.) On his first trip down  
he was about 15 years of age.  
He rowed down from the Channel  
to a mud bar across from where  
Knutson's Club stands now and  
ate his lunch there. Brown and  
others were in their sail boat below  
him at anchor. Whistlers were  
coming up from below in  
enormous numbers and between  
whisks while eating he shot 60.  
The birds were fearless and  
came all about so that  
concealment was not necessary.

Whistlers were very abundant  
in the early shooting. They lay  
down on salt water (probably  
feeding on brine shrimp) and thus  
came up into the river daily to  
drink. Flights would come in and  
immediately when they lit the  
birds would begin to drink.

Angie Macdonald said too  
that Redheads were then much  
more abundant.

Davis said that in 1909 Ducks  
were abundant as ever before.  
In the early days all shooting  
was done from the Duckville

Gym Club on up the river. That  
immobility back of the P. G. clubhouse  
was salt water over one's boots.

June 3, Saturday

Temperature at 6:30 A. M. 52°.

The day was clear and bright and very hot. After breakfast I had Booley take me down to the mouth of Bronis overflow and from there walked west along the north shore of South Bay to a point north of the laboratory. Around the ground was very alkaline and was covered with short salt grass, *Salsomia* or was bare. Along the bay there was a good growth of *Scirpus* growing in water. Patches of cane and bulrushes were scattered all through. Vegetation was getting a good growth.

Ducks were common through here and I found a number of nests without looking for them in particular. Most of those seen were nests of Redheads. One brood of young Redheads was noted.

The mud through here was very sticky and walking difficult. I found that the mouth of the Bear River Club Canal had been extended far out in the lake and went out as long ways before I could cross it. Mud at that filled in brood.

In the area covered I saw the following pairs of ducks.

Spoonbill	20
Mallard	27
Pintail	6
Redhead	87
Cinnamon or Teal	11
Gadwall	4
Buddy Duck	17.
Total.	172

The Buddy Ducks were all about one bay with fairly deep shores. I looked for nests but was unable to find any.

About noon I was north of the clubhouse I came in for dinner.

Mosquitoes are very bad in the salt grass but do not bother much any when I do.

In the afternoon I worked at the laboratory on specimens.

We have given the entire building a coat of flat paint now I and this will help it a great deal. The store room will require another coat still.

June 4, Sunday.

water gauge at 7:00 a.m. 1 ft. 8 1/2 in.  
The river has risen slightly. Perhaps  
this is due to warm weather  
melting snow in the mountains.

This morning I worked on  
notes and correspondence at  
the laboratory.

Vince Davis was up for about  
two hours and we discussed  
the cattle proposition rather thoroughly.  
Mr. Davis contended that he  
had walked <sup>about</sup> ~~over~~ the  
flats <sup>and</sup> ~~and~~ that where the cattle  
strad <sup>there</sup> were no duck nests  
elsewhere where the cattle had  
not grazed. Ducks nests were  
common. I told him that while  
this was true as I had just  
covered the same area myself  
that I did not think that there  
were few ducks resting on the  
marsh. That part of the grazed  
area was not suited to them  
and that ~~the~~ I did not  
think that cattle or horses would  
step on a ducks nest in  
grazing ~~any~~ more than they  
would step on a bad tarp  
when a man was sleeping  
out. He asked how they would  
locate a ducks nest hidden  
by vegetation and I said that

I believed by the sense of  
smell.

He agreed that there was  
about 100 head of cattle in the  
marsh now. I am satisfied from  
talking with him that there is  
some animosity between he and Sackitt  
and Harper regarding cattle that  
the main trouble has been  
stirred up at the instigation of  
the Bear River Club.

In continuing our conversation  
I gave the sportsman shooting  
had some hard reps for violating  
the limit law. Davis tried to  
advance the argument that it was  
the business of game wardens to  
detect and prevent this. I replied  
that with true sportsman with  
the welfare of the game at heart that  
this supervision would be unnecessary.  
That conditions now had restricted  
the breeding grounds of the duck  
until restricted shooting could  
no longer be allowed without  
detriment to the remaining game.

I sounded him on the  
abolishment of the sale of game  
and convinced him that it was  
the thing that must come next.  
He said that it had been  
agitated for years but that it  
had always met with much



opposition. He seemed strongly  
in favor of it before leaving so  
that this talk may bring forth  
fruit.

He said that the Bear River  
Club had all the property that  
he thought they should own  
and strongly advocated establishing  
the remainder of the public domain  
here as a public shooting ground  
and allowing no more titles to  
be taken up.

In the afternoon I collected  
insects on the flowers of gray  
willow.

In one place that I found  
eggs of the Cinnamon Teal that  
had been perched and eaten by  
some bird. Not far from here  
was a family of magpies that  
I thought might be guilty.  
Ten of them I collected with  
my fruit.

June 5, ~~Saturday~~ Monday.

This morning I was up at 5:30 and left in the launch for Corinne at 6:10. At the Bear River Club I picked up Vince Davis and Angus M. Donald and they went up with me. Mr. Davis says that there is a project on foot to Dyle north Bay from Swiford's Point across the opposite shore. This Dyle will raise the water above just at the dam and back the water up clear to the east end of the bay. It may better in case this is taken up to put in a series of two or three lower dikes.

In Corinne I bought various needed supplies.

Scott Gressq. came at noon and after getting our load down to the river we came on down in the launch. We stopped for a few minutes at the grasswood knoll above Hanson's, saw the Burrowing Owl and several pairs of Curlews.

June 6, Tuesday

Air was cool and pleasant this morning and the entire day was not too warm though the sky was clear and the sun shone brightly.

After breakfast with Grisa and Boshy I went down to Sackett's sand out channel 4 as far as Mallard Point.

A good current of water set out No. 4 and water was deep enough to take a boat out as far as we went. Mud lake at its mouth however was shallow and much finer than in other years.

The growths of *Bulrushes* showed very little new growth as yet ~~through~~ and the old last year's stalks stood tall and dead.

Thousands, millions of Chironomids were in the air everywhere and in the salt grass mosquitoes were enormously abundant.

In the immediate vicinity of Sackett's house all vegetation had been cropped down closely by cattle so that there was no cover. Elsewhere conditions were about normal. A good many ducks were in the channel and in the reaches.

The following were counted between the head of No 4 and Mallard Point	
Cinnamon Seal	18
- Spoonbill	6
- Gadwall	3
Sintail	5
Mallard	4
Redhead	70
Ruddy Duck	4
Total.	110

The Snowy & Night Herons and  
Arctic Skuas that nest here have just  
come in. I found a few nests  
that were barely started. None  
contained eggs.

In the afternoon we worked  
at the laboratory. I explained to  
Giesse various bits of routine  
work about the place.  
Night hawks were first seen  
this evening. This is a very  
late date of migration for them.

June 7, Wednesday.

Water gauge this morning 1 ft. 8 inches.  
temperature 52°.

This morning after breakfast I saw Fred Hansen at the laboratory for a few minutes and made arrangements with him to take me up into the marshes below Bergham. He is now catching carp for half

We took the launch and went out Channel 3 and made a count of the breeding ducks on the main channel and all the side channels including the cross channel to 3 1/2. It was clear and hot today, though the morning was cool and pleasant.

There are some changes showing in the South Bay now. Forty or fifty gulls and about 50 Pelicans were in sight.

In addition we found about 100 Pintails and about 60 Spoonbills all drakes spread out feeding on the flats. Three male Cinnamon Teal were seen in 3 on flock also. The two former groups are birds that have completed their breeding some where else and now have nothing before them but the molt. A few of the pintails already were going into eclipse plumage.

The following pairs of ducks were seen in Channel 3 and its branches.

Cinnamon Teal	46
Gadwall	6
Spoonbill	7
Mallard	8
Redhead	18
Pintail	1
Ruddy	1
Total.	<hr/> 87

Drake Cinnamon Teal too were seen in small parties so that they are banding together.

There were a few dead Spoonbills along no. 3 at its mouth that had died this spring. I saw perhaps eight or ten of them. South Bay is noticeably lower here than it was last year. The water does not come up nearly so far. This is without doubt due to low water in the lake causing better drainage of the flats.

June 8, Thursday.

This morning it was and today was very warm. Was up at six thirty and after doing some odds and ends at the laboratory had breakfast. About 8:15 with Grisa and Bosby left in the launch for South Bay. It was very warm all day and all of us suffered from sunburn. I was able to go down as far as usual in the launch and from there we went on down the bay in the rowboat.

Potamogeton is growing rapidly now and shows strands four or five inches long in places. Everywhere on the marsh were great swarms of Chironomids. They were especially noticeable on Stangstedt point and Stangstedt island. Millions of them hung in clouds that made straight columns ten to twenty feet high in the air. At a distance these whirling masses appeared like smoke. I saw thirty or forty of them at once scattered along at intervals of a few yards. The vegetation was black with the insects in places. These flew as I passed in great swarms that completely enveloped me. Fortunately these insects neither

sting on bite nor do they attempt to alight on one in any great number. Only passing annoyance was caused as they touched faces or hands in passing. The water was covered with their empty pupal cases from which the insects had just emerged. Many of the fish lay drowned with them. I dug the mud and snow in the water by alternately doubling and straightening head and tail in the body, were myriads of the larvae. I tried to get a photograph of the adults.

We made a count of the pairs of ducks seen from Slaughter Point to three miles west of Slaughter Island. The following pairs or breeding females were noted:

Redhead	241
Ruddy	3
gadwall	4
Common Teal	5
Mallard	23
Spoonbill	5
Widgeon	1
Total	282

At a point a mile west of Slaughter Island the *Scirpus* in view from the shore line was short and dead giving a barren appearance. This is wholly unfit for breeding.



ducks. Many short tube snipe  
ran out in the water here.

Farther inland the water from  
the old river channel keeps the  
rushes fresh & green.

I was much surprised to  
see 200 or more Greates & Cays  
in the bay. Some were right  
up near the shore line. Though  
none were shot the birds were  
identified with no doubt whatever.  
All noted positively were Greates.  
One or two females were identified  
uncertainly. These were certainly  
not breeding birds.

Forty or fifty Northern Phalarope  
were seen here and two were  
taken. Those observed closely were  
males. The sexual organs of one  
taken were enlarged.

A flock of fifty female Wilson's  
Phalarope was seen also feeding  
in an open lake.

Willet were seen in small flocks.  
Fifteen or twenty were observed in  
one bunch.

When we came down into  
the open bay in the morning. There  
were a few scattered Pintail Grease  
about. Perhaps twenty five were  
seen above Slaghter Point. On  
returning toward evening. There were  
nearly one thousand of them with

A scattering of male Mallards among them spread out on the flats at the mouths of 3 1/2, 3 & 2 and went over into Pintail neck - as we came up they flew off to the south and west with low whistling and quacking notes. These birds had evidently just come in here today. They is not telling from where.

Certainly they had not bred here as I have not seen one tenth this number of Pintails since my arrival on May 15. So in making a bird census during a hurried visit these birds would be most misleading as they would certainly be considered breeding birds.

Back of Slaughter Point was a rookery of olds that I <sup>spanish</sup> estimated at 1500 hundred. There were many more than on last last year. On all the rookery covered about 60 acres. with them were about 200 <sup>Snowy</sup> ~~Trumpet~~ Herons, 50 night Herons and 150 Great Blue Herons.

The rushes here and *Scirpus* were nearly all dead due to rising salt.

On Slaughter Island vegetation was a new growth of fresh green *Scirpus*. Neelys Island was

showed as a low bar.

The water was high  
west of Sloughes Island and  
decidedly brackish. I found a  
few Artemia almost 1 in to the  
shore line and three hundred  
yards out they were abundant.  
There were many myriads of  
tiny ones, not long hatched  
but. With them were a good  
many Ephydra larvae. The pupae  
of the latter were attached firmly  
to Scirpus stems. Floating in the  
water was water and another  
algae.

In South Bay were great  
numbers of carp came out to  
spawn. We killed eight females  
skinning them with paddles.  
These were and I found in  
Sloughes Point. On examining the  
stomachs I was surprised to  
find them filled with animal  
matter. We stripped them in a  
jar and brought them in.  
When I examined them in  
the laboratory later I found the  
following contents.

Mud	10%
Animal matter	97%
Vegetable ..	3%

The mud was probably taken  
in with food adventitiously.

The vegetable matter was  
stems and leaves of Potamogeton  
pectinatus 2%

fragments of stems and a few  
seeds of Scirpus americanus 1%

The animal matter.

Chironomid larvae	96%
Dytiscid "	1%
Stratiomyid "	traces

This finding was a great  
surprise to me as I had  
supposed them eating Potamogeton  
above water. Certainly they  
root up quantities as I see it  
floating in the water.

On the evening of toot larvae  
found to of the Wilson Phalarope  
shot. And I will let for subsequent  
examination - I am putting this  
material up in 4% formalin and  
then transfer it when fixed to 70%  
alcohol.

June 9. Friday.

Last night was the first warm night that we have had. This morning the temperature stood at 66°. The warm weather is ~~bringing~~ melting snow in the mountains as the river has risen in the past few days.

The water gauge this morning registered 1 ft 6 1/2 inches.

It was very warm all day until about 4:00 P.M. Then the wind shifted from west to north west and became stronger and the air was much cooler.

I worked at the laboratory all day. In the forenoon I separated out the Ephydra larvae, Artemia etc. collected yesterday and examined a great mass of material from the carp stomachs. For results see notes of yesterday. Grisea and Bosly were working on the birds secured yesterday.

In the afternoon Grisea and Bosly went out to Basin overflow. They reported practically no ducks on the north lake. The high water had banked the water up on the west shore. They saw a female Mallard with half grown young and that was about all of interest.

I put up a couple of new

shelves in the laboratory today also  
for books and another big one in  
the storeroom for salted skins

June 10, Saturday.

Water gauge at 6:30 a.m. 1 ft. 6 <sup>3</sup>/<sub>8</sub> in.  
Clear and hot all day today.

After breakfast Giesa and I walked across to North Bay and completed the examination of its shore west to Swiford's Point.

Toward Swiford's Point the *Scirpus* and other marsh growth was very fresh and green. A heavy north wind yesterday had blown much water in here but most of it had receded. Water was fairly deep all along the shore line.

The following pairs of ducks were counted.

Pintail	3
Redhead	110
Cinnamon Teal	15
Mallard	7
Gadwall	3
Buddy Duck	14
Total.	<hr/> 152

Redheads nests were common. We found a dozen without looking for them. Two broods of Mallards ~~ten~~ days old were seen and one brood of gadwalls newly hatched. A Redheads nest with hatching young was seen.

Mosquitoes were very bad in the salt grass.

I sent Bosby down No 1 this morning in the rowboat. He reported very few ducks on Pintail Neck. He found that the number of stitts down there had greatly increased so that they outnumbered the wrent. I asked him to get me some clams but he was unable to find any large ones.

Worked this afternoon on some birds secured this morning. Found a female stitt in which four ovarian stitts were easily seen.

Cook went in to Corinne today and brought out some supplies.



June 11, Sunday.

Water gauge at 7:00 a.m. 1 ft. 6  $\frac{1}{2}$  in  
temperature 50°.

Grisea and I worked nearly  
all the forenoon in dissecting  
out the ~~intestinal~~ tract of  
a large carp. I made a  
drawing and notes on this.  
Jim & toke, (the Allen and  
Angie MacDonald came down from  
Pony and with Clyde Webb were  
down for an hour or so. They  
say that they are going to cut  
some hay down here. Davis will  
probably run some cattle later on  
in the season.

Fred Hanson came down in  
the afternoon to cut some hay on the  
section belonging to the Duckville Gun  
Club but found that mosquitoes  
were entirely too bad. So he came  
over and was at the laboratory  
nearly all the afternoon. In mowing  
he had run across the nest of  
a cinnamon teal. As the old bird  
flew off the knife caught her and  
cut off both her feet. She  
escaped. Fred said that in  
mowing in Frederickson that they  
often ran over ducks' nests but  
without injury. He believed that  
more ducks nested on the  
uplands than below him on the

Marsh.

He said the Sackett property included 36 and fraction acres and that he sold it to Sackett for \$3000. Bosley says that the purchase price in a compromise was \$2100.

June 12, Monday.

Water gauge 1 ft. 6 1/2 inches.  
Temperature 68°.

The sky was lightly overcast  
at times during the forenoon but  
later in the afternoon I cleared entirely.  
Cool went on to Corinne today and  
Grisa and I sent laundry in with  
him.

After breakfast Grisa and I  
went in the launch down the  
river and out the Ruby canal  
to its mouth. The canal was  
deep though narrow and I  
had some difficulty through the  
launch blowing in against the  
bank with a strong north wind.  
We left the launch at the  
mouth the canal and walked  
across to Mallard Point. About  
75 pairs of ibis have come in here  
since my last visit and have  
started nests.

We followed the shore line  
down to Long Point and then  
on around into the bay behind  
Lands End. For two thirds the  
distance to Long Point the *Scirpus*  
growth was waist high. Below  
here it became thinner and below  
the point much of it had been  
killed out. It varied in width  
from 50 to 200 yards wide.

inland was an area of dead  
Scirpus and alkali barrens.

The water was deeper here  
than I had thought and has  
rained at least two inches  
recently.

The following pairs of ducks  
were counted in this area

Cinnamon Teal	12
Redhead	135
Gadwall	6
Spoonbill	1
Ruddy Duck	7
Mallard	13
Widgeon	1
Bluebill	1 (?)
	<hr/>
	176

The Bluebill was a single  
drake that swam by us a dozen  
times as ducks will past this  
nesting place no female was seen.

3 broods of mallards ten days  
old were seen and another family  
that  $\frac{3}{4}$  the size of the female

The geese are now down  
in this area. I found five  
places where geese were roosting.  
Areas of Scirpus several feet long and  
a foot or two wide had been  
broken down and with the dead  
growth underneath formed low  
platforms partly elevated above the  
water. These were covered with

fresh dung. Many feathers were scattered about. These geese are now molting and I will not appear on the marsh again until July. I looked carefully for the birds but did not see any. I asked Hanson yesterday where they mottled and we both agreed that it must be somewhere in this area.

In considering a wild fowl reservation here I had thought of running a line across from North Shore Island (or Bay Island, as it is known to some) and closing the lower half of Hanson's Island. On looking the matter over carefully however I find that this is not sufficient. Should the lake rise again this area will be almost barren as already much vegetation has been killed by salt. It is almost imperative that the entire island be covered. In making this Sackett should be bought out. A warden would have to be placed in charge of the marsh and this warden could live in Sackett's house. For shooting purposes blinds could be allowed within 25 feet of the outer edge of the rushes from the mouth of  $3\frac{1}{2}$  to S. Lighthouse islands. This would allow hunting during the open

season and would not affect the  
ducks. There should be two  
wardens I believe. One a local  
man well acquainted with the  
marsh (Sackett or Kanam perhaps)  
and the other a man from  
outside the state a man of  
undoubted integrity (so far as  
game matters are concerned at least).  
This last man should be in  
charge of the station. By preference  
would be a <sup>trained</sup> naturalist capable of  
making observations on the water  
fowl that would be of value.

It might be well too to extend  
the line of the preserve across  
from lands east of Neely's Island  
to Klondyke so protect the spoonbills  
and Bluebills. All lines <sup>marking</sup>  
the reservation should be indicated  
by cement posts that there might  
be no arguments in regard to them.  
Stations for blinds on the west  
shore of South Bay might be indicated  
by the wardens.

The installation of a registering  
microphone might aid in picking  
up stray gun shots out of the  
hunting season.

The damage by cattle grazing  
I think will be worse after  
the breeding season than before.  
The thousands of ducks that

Come in during summer need  
cover in which to smelt. If they  
do not have it they will be in  
a bad way.

From the bay at the end of  
our trip it could be seen  
or shown him plainly. It was low  
and flat slightly raised above the  
water level. The *Scirpus* growth on  
it seemed entirely dead. This  
fall if opportunity offers I  
want to travel this shoreline  
from Blue Creek to Promontory Point.

From here we proceeded back  
inland to the old river channel.  
There was a great central  
area here nearly bare of vegetation.  
We attempted to wade the channel  
with boots on but found it too  
deep. Finally removing boots  
and trousers we crossed it.

The water in the middle wet  
my jaws stick so that certainly  
we would have been in a bad  
way with boots on. The bottom  
was soft and muddy. Desks  
growths of *Potamogeton pectinatus*  
were appearing and moss  
and algae was abundant.

This same moss was appearing  
in great quantities on North  
Bay crossing the old river channel

There was first a narrow band  
of salt grass and then a  
broad alkali barren. Higher  
up toward Sackett's short salt  
grass appeared and a mile and  
a half below Sackett's this growth  
covered every thing. The old  
willow stubs marking an  
ancient channel were still much  
in evidence. They show on the  
bank of the first western branch  
of the old channel too. I  
estimate that they grew here in  
the forties or fifties.

Carp were present in north  
Bay in numbers as far down as  
we went.

We had no trouble in coming  
up the ~~old~~ canal in the launch. This  
canal is very deep as in coming up  
the launch drew far down and  
made a great wave behind.

Reached the Laboratory about  
4:30.

I sent Bosby down no. 2 this  
morning. He encountered a flock of  
30 Bonaparte's gulls and secured  
three of them. He collected also a  
greater yellowlegs. He reported nothing  
unusual in the way of ducks.



June 13. Tuesday,

Water gauge at 7:00 a.m. 1 ft. 6 1/2 in.  
temperature 60°. Clear and warm  
all day.

This morning I worked at the  
laboratory on notes correspondence  
and research into the characteristics  
of ovaries.

Bosley and Giesse went out  
3 1/2 and across South Bay as far  
as Slaughter Point. They reported about  
450 Pintails, 50 Scaup and 25  
Greenwinged Teal that were at the  
mouth of 3 1/2. They brought in  
one female Greenwing that they  
found with a wing broken by shot.  
There were also about 50 mallards.

Afternoon I went out the  
Bear River Club canal with the  
launch. The following pairs of  
ducks were counted along it.

Cinnamon Teal	11
Mallard	4
Gadwall	1
Scaup	2
Redhead	3

Total 21.

At the mouth the marshes had  
made a good growth and  
here there were about 200 mallards  
and 50 pintails all drakes. The  
runs through the rushes were  
filled with feathers that they

had shed. I saw two Mallards  
that seemed barely able to fly.  
Yrison killed a Pintail today  
that seemed to have the intestines  
normal in every way.

A male pukean that he killed  
had a horn only 12 mm high by  
about 80 mm long. This bird  
was diseased. But one testis  
was developed and it was small.  
The intestine was thickly walled  
and intensely irritated in the  
duodenum and had many  
small hard ulcers along its course.

The boys reported many carp  
in the bay. They brought in two  
and I had their stomachs preserved.

June 14<sup>th</sup>, Wednesday

Water gauge at 7:00 a.m. 1 ft 6 1/2 in.

Clear and warm all day.

By storm of easy day a south breeze springs up that tempers the heat very pleasantly.

With Griesa I left the laboratory at 8:30 for Lands End West. The pump on the motor refused to work after she had started and I had to take it apart and fix it. We went down to the mouth of the Nely canal with the landing and then on down the old river channel in the rowboat. We turned out the first west channel and followed it into the bay east of Lands End and from there proceeded on foot.

Along this West channel the following <sup>birds</sup> Ducks were seen

Ruddy Duck	3
Common Teal	18
Redhead	26
Gadwall	6
Spoonbill	2
Mallard	5
Total	60

From this bay on West the the end of the island was covered with rushes but all were chad- w sickly yellow new growth, showed along the water's edge but inland

no new shoots had started.  
Few breeding ducks were seen. The  
following pairs were counted.

Mallard	2
Cinnamon Teal	4
Redhead	6
Gadwall	2
Spoonbill	1

The country was hardly  
suited to them. There were many  
quack in her morning but none  
were seen. Their tracks appeared  
in all the small channels and  
in some places the mud was  
still ~~traced~~ suspended in the  
water when they had passed. I  
watched far ahead for them but  
saw no sign of them. There were  
many feathers strewn about.

Water was slowly submerging  
these areas of dead rushes. Pools  
and small runs of water were all  
through. Some of them were fairly  
deep. Water here was saline.  
I saw Brine shrimp in pools and  
bays. *Potamogeton pectinatus* was  
growing here in water stronger  
with salt to the taste than in  
normal salt solution. It was  
barely starting.

A Broad bay cut the end  
of the island off. Large areas of  
submerged rushes could be seen

off shore that had been covered  
by water recently.

Above the area of dead  
rushes was an extensive  
alkali barren. Still farther up  
was the rush area kept  
fresh by the old River Channel.

Water in the old river channel  
has raised nearly three inches.  
Probably because of the growing  
aquatic growth.

We were three hours in going  
down and two and one half in  
coming.

On Land's End was a great  
flock of Pintails with scattered Mallard,  
Spoonbill, Greenwinged Teal, and Redhead  
with a few scattered Wigeons.  
All were strakes. I estimated  
as follows.

Pintail	2600
Spoonbill	50
Mallard	100
Greenwinged Teal	100
Redhead	50
Wigeon	3 (perhaps more)

I doubt if many of these birds  
have bred in this valley.

Finch, Besson, Husker, Moore, and  
Rogers officers etc of the Duckville  
Gun Club came down in the evening.

June 15, Thursday.

Today I worked at the laboratory all. Part of the time I spent studying the ovaries and other parts of shorebirds to determine whether or not they had been breeding.

The gun club members who came down last night left this afternoon. They reported seeing a <sup>young</sup> goose on Slaughter Island.

June 16, Friday.  
Very hot all day today. Sent  
Bozly to Corinne today for supplies  
and water.

After breakfast with Guesca  
I went down No. 1 to look over  
shorebird material. Very few ducks  
in sight here.

Yesterday Clyde Webb told me  
the Davis had had them putting  
up hay up along the river. They  
have cut between 30 and 40 tons.

The mowing knife cut into one  
male American teal and killed  
him. They found one gadwall's  
nest in cutting. Last Sunday Fred  
Hansens caught a female in the mown  
blades and put off both her  
feet. The bird escaped.

The water has raised two  
inches at least down here on the  
bay because the water has been  
backed up and checked by growing  
Potamogeton on the flats. This rising  
water has covering considerable areas  
on the banks of the overflows. No. 1  
is higher than at any time last  
year. Since warm days have  
come cattails and willows have  
made great growth. Four days ago  
I saw bursting down in willows

These black willows (Salix  
amygdaloides) grow rapidly - Two

ago a small shoot started here  
and no. 1. Now it is a fair sized  
bush 3'2 feet tall. Other little shoots  
are coming up here. I had Bosby  
chop off the growing willow shoots  
on the bus (about our landing  
stage).

We collected 10 shells, 9 Wilson  
Charopu & 4 Killdeer.

In the afternoon at the  
laboratory these were skinned  
and the ovaries of the females  
extracted. These I dropped in  
picric formal as a fixative. I am  
going to attempt to differentiate  
fructified cells from those that  
have not developed by means of  
stains.

In the evening Joe took us down  
on the bay to try out a new <sup>and</sup> boat.  
I was steersman and found it  
great sport. We went down the  
last shoot as far as Davis Island.  
The boat ran very well. Mose  
was high but it ground along  
through it. On snow open stretches  
where the water was shallow it  
made very good time. Cook claims  
that on long stretches of smooth  
mud that it will make 25 miles  
an hour.



June 17, Saturday.

Today I worked in the laboratory all day. ~~Spent~~ A part of the time I labored with the shorebird material collected yesterday. Grisa and Bosley were out on Hudson No. 1 this morning but found little that was new.

The water gauge registered 1 ft. 7 in. this morning. Fred Hansen reports a drop of five inches in the river at his place but the water is backing up below so that it holds its level here.

On the afternoon Grisa and I went up along the river and examined the area on the Bear River Club grounds where McDonald and Clyde Webb have been cutting hay this past week. The area involved extends along the river bank for a distance totalling about  $\frac{3}{4}$  of a mile. The strip is not continuous but extends from the east end of the fence on the southern boundary of Section 25 (up stream from the laboratory) east to the line between the Bear River Club property and Knudsen's. On parts the hay

was too thin and these were  
passed over. ~~About~~ a strip  
equal to  $3/4$  mile long and  
from 4 or 5 to 20 ~~in~~ mow cuts  
wide was taken. In addition  
areas of snow down around the  
willows had been mowed with a  
scythe. ~~Between a third and a~~  
A part of this area is around  
the clubhouse and the guide house  
around the latter ducks would not  
be expected to nest but around the  
latter they certainly do and  
should not be disturbed. So me  
this mowing is worse than  
the ranging of cattle. I took  
a roll of film showing the  
cut over areas.

This evening with Gress  
Booby and Coof I visited Webb  
and McDonald at the Bear River  
Club. Some information in regard  
to ducks nesting in the snow  
areas was brought out during  
general conversation. Webb said  
that he had caught a male  
Cinnamon Teal in the Knife  
had cut off the tip of his  
bill, one foot and his wing.  
McDonald had cut over some  
Gadwall's nest and several nests  
of Cinnamon Teal in the area  
near Knudsen's. The Teal had

deserted but the gadwall  
still remained. Below the club  
he had run over a number  
of Seal nests. One Redhead's  
nest had been discovered but  
he had cut around it to leave  
the female sheltered.  
Very hot all day today.

June 18, Sunday.

Slightly cooler this morning. but hot late on. The mountains are now misty and distant as in summer.

This morning Grisea and I after some trouble extracted out the intestinal convolutions of a sucker. Webb had fifteen of twenty last night that he had seized in an overflow. The species prove to be *Castostomus ardens*.

After dinner Grisea and I were shown the Bear River Club house by Webb. We examined the bird collection with interest and made not a few interesting records.

Afterward we went out and looked at the Gadwall's nest laid bare by the snow and I took some pictures of it. The bird was still on. Nearby was down from another Gadwall's nest that had been destroyed.

Below the Bear River Club I found a Common Teal's egg that might have been broken by a rat.

Sackett and Webb were at Duckville in the evening in honor of

a birthday for Helen Cook and  
myself.

June 19, Monday

This morning about 7:30 I left Duckville and rode in to Corinne with Harpers. They carry Cream in even day and send it to Brigham by express. We drove to Koundawis crossed the river in a boat and then took a ford the rest of the way.

Koundawis Bros of Brigham brought 200 head of cattle down Saturday so Fred Hansen told me. This morning practically all of them were killed or standing near the Bear River Club. I counted 170 as we drove through them. It was quite warm all day but clear and pleasant. I left Corinne at 9:41 and after changing at Brigham reached Ogden at 11:00.

Registered at the main and then spent the rest of the day in purchasing supplies. I had lunch at the Red Hotel. He said that it would seem that he had been deceived by Davis as regards the number of cattle on the marsh here. He said that plans for taking North Bay were as yet tentative. That a final report would be rendered by an engineer this week.

The paper this morning announced the calling out of the National Guard. I called up Grisa at Duerfille in the evening but he said that as yet he had received no word.

This afternoon I called up the State Game Warden's office in Salt Lake City to learn that he was at Fish Lake and would not return for several days.

June 20, Sunday.

This morning it was cold and the sky was cloudy and overcast. I left mine and went to Salt Lake City on the trolley reaching there at 10:10.

Called at Schramm-Johnson's to learn the amount of my last bill. It came to \$7.01. In addition I purchased 1 lb of Formaldehyde.

At the Mine and Supply Co I bought a small order of glassware and ordered it sent to Corinne by express.

At noon I called up Geo. Smith who is teaching at the Summer School in the University of Utah. He met me at Finch and Rogie and we had lunch together. About two I visited the

At game Warden's office and secured a permit for Mr. Griesa to collect birds. I had hoped to get in touch with Joe Smith, Deputy Warden but he had been called suddenly to Fish Lake. Met Mr. Terry a deputy.

I tried to buy some head nets for geats to stay but could find none that were of any account.

A few minutes past four I was through. Called on Mr. A. W. Greganya for a few minutes and enjoyed talking with him very much.

Left Salt Lake City at five and reached Ogden about 6:10. Found Griesa waiting for me at the Marion. His summons to join his company had been wired to him this morning. He came up the river in the launch at once. We had dinner together at the Reed and then straightened out various business matters. He left for Lawrence Kans. at 9:10 P.M. I regretted his departure very much as he has taken hold of the work in good shape and had just mastered the various details so that he was of much assistance. It



Will leave me alone again for  
some time I fear.

I wired the office notifying  
them of his departure at once.  
Called up the Durkville gun club  
in the evening and told Ray  
to meet me at the train in the  
morning.

Twilight it is very cold  
with a strong north wind. It  
rained a little in Ogden and  
I was told that snow fell in  
Garland

June 21, Wednesday.

Was up this morning at  
6:30 dressed shaved and  
packed up.

Left Ogden on the Oregon  
Shortline at 8:30. This train  
now goes through Brigham and  
up the Malad branch without  
change. Reached Corinne at 9:40.

It was raining in Ogden and  
it rained quite heavily until  
about three in Corinne. Bosby  
was delayed for some unknown  
reason and did not reach  
Corinne until two or after. I  
called Hunsin's finally as I thought  
that he might have broken down  
some where but learned that  
he had not passed there until  
11:30.

Corinne is not an ideal place in which to kill time. It was cold and gray this morning and in the post office and Blacksmith shop was the only fire that I could find.

When the clouds cleared away finally the Wasatch range was white with snow down to about 6000 feet.

Cook's came in to Corinne in their Ford about two. Mrs. Cook rode down in the launch and Joe and I went in down in the car. It was hard driving as the flats were very slippery. We reached Knudsen's only a little bit ahead of the launch.

It was cold and raw at Duckville but cleared away entirely in the evening. Everything at the laboratory seemed all right.

June 22, Thursday.

~~Water~~ This morning as soon as I could get breakfast I went up to Hansen's in the launch and with Fred Hansen drove up to the Black Slough below Brigham. It was cold this morning with a north wind and an early morning temperature of 43°F. The cold kept down the mosquitoes otherwise they would have been unbearable while driving.

The Black Slough rises near Honeyville and come down in below Brigham to drain into the eastern or northern part of the Willard Spur. In its lower course it drains water through the channel from Bear River. We worked the lower end for a distance of about four miles. There is a great series of sloughs here grown up largely with the pond lilies and with long channels with deep runs. *Scirpus Americanus* is common. The small scirpus known as wire grass was abundant.

*Botrychium uncinatum* (369) was abundant all through. *Chara* #370 was common and there was a

Great growth of Potamogeton pectinatus.  
On drier areas were great  
growths of Rumex, Cocklebur,  
Pondus erecta. Onagra strigos,  
Sarcobatus asper, Radicula integrata  
and Lactuca integrata were abundant.  
Distichlis spicata covered large  
areas and I found great growths  
of Nardium jubatum.

I plantain (373) Triglochin maritima  
a Chenopod (372) Atriplex hastata  
and a chickweed (371) Polygonum aviculare  
with a grass (367 & 368) Polygonum monspeliense  
were common and would afford  
duck food. Salicornia subterminalis  
the alkali flats and I found  
some Allenrolia occidentalis. The  
small knoll had a few Sarcobatus  
verruculatus on it.

I worked up through the  
center of the swamps and returned  
by another route. I estimated roughly  
that I had covered half the area.  
The channels were rather deep so  
that it was difficult to get  
around. A good many Chalk  
Cinnamon Seal and Spoonbills had  
gathered in here. This area is  
constantly pastured by Kumdaun  
brothers and tracks of stock  
showed all through the bushes.  
Yet there seems to have been little  
effect on the ducks.

In the following table the first column gives the pairs of birds actually seen, the second column the same number multiplied by two as an estimate of the actual number of breeding birds.

	1	2
Common Seal	49	98
Redhead	73	146
Godwall	7	14
Spoonbill	17	34
Pintail	5	10
Mallard	11	22
Ruddy	7	14
Total	169	338

Much of the region visited was too deep to wade so that we were unable to work it thoroughly. I am firmly convinced that duck censuses to be accurate must be begun not later than May 15 and should not extend beyond June 20 if possible. July notes would be almost without value.

In going out we got in one channel a foot over the bars and stuck with one horse down. We unhitched and Fred took off the cover. He fastened a rope to the tongue tied the other end to the corner and with the horses on dry ground pulled out easily. We came back to the rig

About three ate lunch and  
then started back.

On the way we met Andrew  
Jensen ("Andrew Blue") and Peter  
Christiansen. They have returned  
from taking more cattle below.  
They said that there were 200 head  
down there down now but I  
think it is well over 200 myself.

June 23, Friday.  
Temperature at 6:30 50°. Water  
gauge 1 ft 5 <sup>3</sup>/<sub>4</sub> inches. The rain  
that brought a marked rise in the  
river.

I worked at the laboratory  
all day. Made up a few young  
birds collected yesterday and  
straightened out the mass of  
detail that has accumulated  
during my absence.

I sent Bosley down Channel 2.  
He reported nothing much in  
the way of ducks. Wilson Phalaropes  
were common and he collected  
some young yellowheads. He has  
attempted to collect clams for me  
in Channels 1 and 2 but has found  
them all dead. The dry season  
last year must have killed them.

The Bear River club in joining  
to hold back Sackett's and Herpes  
cattle are throwing a fence at an  
angle across section 26 Twp 9 N,  
Range 4 W. This is government land.  
They have begun at the southeast  
corner and are running directly  
toward the northwest corner.

Furthermore that part of section 25 that  
lies north of the river is still  
government land as it is unsurveyed.  
When it is finally surveyed it will  
be a railroad section and then

The Bear River club will have  
an option on it. The small part  
of section 25 that is south of  
the river has been surveyed and is  
the part on which the  
laboratory is located.



June 24 Saturday.

Temperature this morning 52° +  
Water gauge 1 ft. 5 in. The river shows  
a marked rise due probably in  
part to run off from the rain  
of Wednesday and in part to the  
turning in of irrigated water that  
is not needed because of this same  
rain. Clear and warm all day.

After breakfast we went out 3 1/2  
in the launch. The water in  
South Bay was as high as I  
have ever seen it. Near Sacketts  
3 1/2 was almost bank full. A  
raise of another inch would  
flood considerable areas. The bay  
was full of water of a milky  
muddy color and was  
draining swiftly. There was a  
current of nearly 2 miles an hour  
clear over along the rushes on the  
west side. The water here was  
twelve inches deep at least.

With this abundant supply of  
fresh water there will be no sick  
ducks for some time at least.

There were about 200 male  
Cinnamon Teal scattered along  
at the mouth of 3 1/2. Other ducks  
showed little change save  
that there were fewer drake  
Pintails than usual.

I laid in a blind above

June 26 Monday

Water gauge at 7:00 a.m. 1 ft. 4 3/4 in.  
Clear land very hot today

Every afternoon a breeze springs  
up from the south and blows  
steadily. Usually it begins by  
10:00 a.m. Sometimes it delays  
until noon. In its steadiness  
and pleasant coolness it  
reminds me strongly of the  
trade winds of Porto Rico. The  
air is hot and dry but the  
soft force of the breeze brings a  
sensation of coolness that is  
refreshing.

After breakfast I left for the  
grounds of the Chesapeake Duck Club  
in the launch. I went up  
as far as Hansie's in the launch and  
I left it there. Mr. N. S. Mills who  
is in charge of the Chesapeake property  
met me and took me up to the  
club house in his car. The clubhouse  
is about a mile from the river  
and stands on a low knoll.

We were out in the forenoon and  
explored Goose Island and some  
marshes. Great near it and in  
the afternoon worked back as far  
as the entrance of Woods Creek  
at present the club have  
32 inches of water at their dam.  
Formerly Woods Creek ran directly

through into North Bay. Mr. Harvey about 1902 or 1903 formed a club and dammed the creek to make a good body of water. The Chesapeake Hunt Club at present has 50 members. With water at its present stage they have about 2000 acres of water.

I was told that the club rules specify that any member violating the game laws shall be expelled and that no member is allowed to sell his ducks. Mr. Mills told me that for a short time he was steward of the Bear River Club and that these members were allowed to turn in their ducks on their board bills.

The lake here averages deep so that it is easy to row a boat in it. It runs from 3 or 4 inches to 3 feet. The average depth ~~down~~ is from 8 to 12 inches or more. There is a large area of about 1200 acres in one body and then some marshy channels.

Potamogeton pectinatus great everywhere covering practically the entire lake in the open water. Because of the depth of water it makes a great mass of leaves and stems. It rises to the

surface flows and then when  
the pond forms sinks again.  
When then some carp in the  
lake ~~these~~ fish rots great masses  
of it loose and storms rolled  
it ashore in windrows. The  
fish were taken out by draining  
the lake and now the Potamogeton  
sinks and lies on bottom.  
At the beginning of the hunting  
season the board is taken from  
the dam. This lowers the water  
exposing a part of the Potamogeton  
for the shallow feeding ducks.

This is done two or three times  
during the season as the feed  
is eaten up.

*Myriophyllum* (376) covered  
the bottom when the water was  
deeper than 10 inches. It grew in  
a dense carpet beneath the  
Potamogeton.

And algae or moss (see alcoholic  
bearing this date was abundant  
growing on the surface of the water.

A round *Scirpus* formed dense  
clumps covering large areas at  
the eastern edge of the lake.

*Scirpus americanus* covered  
large areas of shallow water and  
also great growths extended  
out on drier portions when now  
there was no water.

Goose island a Knoll in the lake and other knolls showed scattered growths of Sarcobatus vermiculatus. Scattered clumps of Atriplex confertifolia were found and a low woody stemmed plant (see specimen). Allenrolfea was common and in suitable localities were dense mats of Distichlis spicata. A pigeon grass was common and two other grasses were found. On broad flats covered with abundant vegetation were in addition Lactuca integrata, Sonchus asper, wire grass (small & crisp) Cochlearia (Xanthium echinatum) Rumex a few Radicula hispida, Thymus setiva. Considerable clumps of Melilotus alba were found and some Melilotus officinalis. Salicornia rubra grew on the barriers.

(For plants see nos. 375-383).

As a breeding ground this area is not used so much as it might be. There are a number of farm houses about and I was told that some of the farmer boys gathered eggs. A dog from one farm house was reputed to live on eggs. And I saw one Coyote. He put a herd of cattle when we and sneaked away. Cattle and

Horses range through a good deal of the marsh and eat down the rushes which may too be a disturbing factor. Drier areas are cut for hay and many nests exposed are destroyed by the rakes.

I made a count of the pairs of ducks seen but think that in final results this should be multiplied by two as in column 2.

Cinnamon Teal	1 34	2 68
Gadwall	9	18
Spoonbill	6	12
Ruddy Duck	14	28
Redhead	20	40
Mallard	10	20
Pintail	4	8
Total	97	194

~~There~~ Although drakes of various species were seen in some numbers they were not present in the great bands in which I find them below.

I left the Chesapeake about 5 and reached the laboratory about 6. Saw Mr. Davis at the Bear River Club.

The sun was intensely hot today. Mosquitoes were bad during the evening.

June 27 Tuesday.

Water gauge at 7:00 a.m. 1 ft. 4 3/4 in.

The river has begun to go down. This morning the drop was barely perceptible. Last night was warm during the first half.

Later a strong breeze came up from the south and I was glad to pull a blanket over me.

The day was very warm but the heat was tempered by a strong south wind.

Mosquitoes were bad all day.

They came in to the laboratory on our clothes and we could only kill them on the screens as best we could. In the evening they fairly swarmed in spite of a strong breeze. I went out at dusk and went up the river in the launch. My face and arms were black with them. I could get the motor started. I have not seen mosquitoes so bad here on other years.

I worked at the laboratory all day clearing and embedding some bits of gut and spleen. The new water bath works very well. Prepared my notes for yesterday quite a mass of them. I had intended to go to Corinne tomorrow and visit some

Pectinatus here with great  
Massys of floating grass  
above it. I walked down  
through Seal Pass on foot.  
Myriophyllum was abundant  
just in shallow water.

The water is so high that  
the small islands here  
preliminarily dry in part are  
covered with an inch or two of  
water.

The bays everywhere and  
the lower portions at the  
mouth of the overflows are  
flooded so that no mud bars  
are exposed. I have been looking  
for an area where I might  
find shorebirds and so came to  
Seal Pass. Half a dozen greater  
yellowlegs were the only migrants  
seen. Two that I shot were females.  
Many male Common Seal were  
in the overflows.

Worked at the laboratory in  
the afternoon mainly on the  
ovaries of shorebirds. (See notes.)



June 29, Thursday  
Cooled this morning with a  
pleasant south breeze all day. The  
haze has cleared away from  
the mountains so that they  
stand out again clear and  
bold.

No. 2 After breakfast we ran down  
in the Ranch to its mouth  
and then went on down East  
Pass and through the Rat trail to  
Klondike. The water ran 7 or 8  
inches deep clear to the head  
of east pass and even at the  
head we had no difficulty in  
getting through. There was shallow  
water here but the mud was  
smooth and the boat ran over  
it easily.

Scirpus has made a luxuriant  
growth here through the abundant  
supply of fresh water. It stood  
two and three feet tall all along  
the banks of the channels. I searched  
all through the last years growth for  
seed heads still carrying seeds  
but found them all empty. The  
seeds are carried in the heads  
in many cases however until the  
middle of May and the first of  
June. Even now there are many  
seeds on the ground. The new  
heads in most cases carry

full sized seeds that are still  
green but are well filled out.  
This *Scirpus* furnishes food for  
the entire year through its seeds.  
It is a most valuable winter food.  
~~The~~ The abundant supply of fresh  
water has made a great difference  
in the *Scirpus* growth on Klondike's  
bars that ~~remained~~ entirely dead or  
at best showed a sickly yellow  
growth along channels were now  
green and flourishing. Dead growth  
extended about 1/4 mile north of the  
old wagon. A good current  
held through the ~~stagnant~~ channels.

Shovbirds are beginning to  
come in. Greater yellowlegs were  
fairly common in Peterhead of  
East Pass and I saw a number  
of lesser yellowlegs. Foxglove was  
secured and as many were seen.  
These birds certainly do not breed in  
the marsh but may nest only a  
short distance away. A gunshot  
frightened several hundred Willet  
from a pond at one side and with  
them were numbers of Wilson's  
Phalarope.

Small flocks of Wilson Phalarope  
have been passing over the marsh  
toward this country from the north  
since the middle of June and  
today they were seen often a

dozen, thirty or forty together flying  
swiftly in close flocks, wheeling  
over the water but seldom  
alighting. Several pairs that were  
evidently breeding were seen along  
the banks of No 2 and along  
East Pass. Near the end of the  
Rat trail I stood up to look  
out across the marsh and  
saw a great flock of shore birds  
standing on a pond half a  
mile away. We pushed the boat  
down for a quarter of a mile farther  
and then I got out and walked  
across through the shallow water  
and rushes toward them. The  
rushes were (had been) deep  
stubs projecting from the water  
with shallow open pools here to  
three inches deep flooded with a  
soft greyish clay, slippery muddy  
foot. On coming into the open I  
saw at once that the shore birds  
were Wilson's Phalarope but not  
until a nearer approach did  
I perceive their number. They  
stood in close rank in the open  
water on all the pools within sight.  
On one long pond directly in  
front of me I counted the birds  
in squares of one hundred and  
reached a total of 6500. There  
were four or five times that many

birds within a quarter of a mile.  
~~And how many I thought that~~  
there were somewhere between 20,000  
and 30,000. How many more there  
were at a distance I had no means  
of ascertaining. Later standing in the  
old wagon I could see ~~birds~~ scattered  
flocks as far as the binoculars would  
carry through the haze.

Piling up some *Sciurus* stalks  
washed in here ~~from~~ by some stream  
I sat down to watch the birds.  
Fewer than one bird in 200 in these  
great flocks were males. The others  
were females all adults. They  
stood quiet at times all facing  
the wind and then suddenly  
active ran about jutting at  
the wind. Now ~~around~~ flocks  
were dropping in, alighting,  
holding their wings fully extended  
for ~~an~~ instant and then  
sprung with the others. Small  
toes rose and flew a few feet only  
to settle again. A vociferous protesting  
my presence ran through the  
masses of standing birds at  
times had threatening them with  
extended wings. The little Phalarope  
broke aside before them leaving  
them a clear lane for passage.  
Finally walking toward this  
flock and forced them to rise

As they left the water I  
shot into the flock securing  
twelve immediately the air  
was full of Phalarope all about  
me. They rose and circled  
springing & crouching and  
then breaking until it seemed  
like a perfect snow-storm of  
tiny feathered bodies.

In smaller flocks I  
found a larger percentage of males.  
For example in one lot of 300  
birds about 25 were males & no  
young were seen at all. Evidently  
the young must be left to themselves  
early while the adults gather in  
flocks to molt.

~~These birds~~ Returning to the  
laboratory I worked until 7:30 pm  
the various of the birds that I  
had secured.

June 30, Friday.

Today I worked at the laboratory all day. Practically the entire day was devoted to correspondence and to making out the monthly reports and expense accounts.

Very hot all day.

Cook repaired the pump on the launch today. It has not been working well for some time.

Had Bosley pack up all the skins on hand and prepare them to send in.

Wrote a report on the present status of the duck report.

Expenditures June 1 - 30, 1916.

Amount available at first of month	254.49
Total expenditures	<u>253.57</u>
unexpended balance	.92
Estimated expenditures for July	215.00

Transportation request 9.46030  
returned for cancellation.

due item of total expenditures  
253.57 above is included 7.51  
due on Form 5 to Schramm-Johnson  
bill for which is not yet at hand.

Following are items of expenditures


June expense voucher	188.31
Bosley salary	50.00
Trans. requests	1.70
Schramm-Johnson Form 5	6.05
" " due	<u>7.51</u>
	253.57

July 1 Saturday.

Temperature at 4:20 a.m.  $53^{\circ}$   
water gauge 1 ft.  $5\frac{1}{2}$  inches.

I got up at daylight this morning and started for Corinne in the launch. Near Kundsans the boat broke down so that I could not make it. Came back to Kundsans and then waited for the Harpers and rode in with them, sending Bosby back with the launch.

The early morning was fine and cool. I was surprised to see how low the temperature went. As soon as the sun rose however it was intensely hot almost at once.

At Kundsans Clubhouse I found a mud wasps nest built in the top of a clothes of a clothes hook  that was screwed

in the wall. There were a number of Myotis in here and I collected one young one.

Across from Kundsans water in North Bay has come out for a long distance across the flats.

The ride in to Corinne was without particular incident. On town I certified to my monthly expense account, got the mail and then returned. Was at the



Laboratory again by noon.

In the afternoon I went down Channel 1. Not many ducks in here now. I collected a few shorebirds. Water has raised all along here an inch or more.

Returned to the laboratory and worked until 6:30 or ovaries of shorebirds collected.

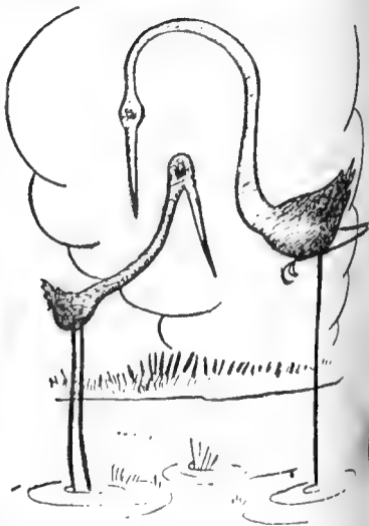
Mosquitoes continue to be very bad but ~~black~~ buffalo quats are fewer in number, though still abundant enough. There were many mosquitoes about in the grass near the mouth of no. 1.

July 2, Sunday.

Water gauge this morning 1 ft 5 1/2 inches. Clear and hot until about 5 P.M. I worked at the laboratory all day. Cook fixed up the engine in the launch in the morning.

About 4 I walked up along the willows to the end of my enclosure but saw very few birds. Foxtail heads are ripe now and fasten in socks causing considerable annoyance. The bearded woads work in through heavy wool stockings and go clear to the skin.

In a small sandy area near the laboratory is a colony of peculiar solitary wasps with broad flat bodies. Males have the abdomen banded with pale green females with gray green. The females had numerous burrows around in the sandy soil and were digging in them. Alighting near the entrance of a burrow a female would throw a steady jet of sand grains out between her feet behind the sand flying to a distance of four inches. The fore tibiae were heavily spined for this labor and all digging was done by them. After digging an instant at the entrance they would back up quickly a few



“Oswald, your neck is dirty.”  
—Yale Review

Oswald.

July 2. 1916. Today Oswald has been trying to fly again and is making fair headway. He stands waves his wings and then runs out across the flat for forty or fifty feet. At the end of the last jump he leaves the ground for ten or twelve feet. For three days he has been able to fly to the top of one of the experiment pens a height of three feet.

This afternoon there was a severe windstorm, so strong that he could barely stand against it. Once or twice it caught his wings and nearly overturned him. He refused to stay in the lee of the house but walked out facing the wind (west) and got out in the shelter of the willows.

For a while he has played for a few seconds at a time with sticks. This morning he was very friendly. Finally he picked up two or three bits of willow arranged them and some rushes around in his box and then settled down exactly as if on a nest. Now this bird may be a female and if so we may have a sex stirring (as in erecti penis in male children) that prompts the bird to simulate nest building and incubation.

The dog came over this morning and Oswald promptly

above him into the willows.  
Tonight it was raining and  
I fed Jim inside. He was greatly  
excited and after each meal  
waved his wings wildly with  
feathers on end and outstretched.  
Heck calling ravenously at you,  
ee yot instead of the usual  
mechanical Kack Kack Kack. Afterward  
he drank from the dipper.  
On the evening he sat on his  
box perch and suddenly drew  
up one foot and stood on one  
leg for a long time. He has never  
done this before.

He spent much time preening his  
feathers tonight. On doing this  
he works the point of the bill for  
several seconds in the powder down  
patches on breast or back and  
then works at the bases of the  
contour feathers stuffing them  
out through his bill. This he  
has done since June 21. His  
plumage is very fine now and he  
is very graceful.

Mosquitoes bother his legs  
considerably and at times he raps  
one foot smartly on his perch to  
jar them off. He picked them off  
too and today caught several  
on me and swallowed them.  
He watched them light on me with

marked interest  
After a thorough preening he  
goes to sleep standing on one  
leg. In sleep the neck is  
drawn down and the head  
laid in the fold between it and the  
breast with the bill pointing straight  
down, and the top of the head  
at a right angle to a sagittal line  
even and in the same plane with  
the wing. The feathers fluff out  
and cover the eyes completely.

The eyes are closed. The upper  
lower lid being brought up across  
the eyeball.

When he awakes he  
stretches by extending one leg  
at a time behind and then  
showing the wing of that side  
out over and beyond his foot.  
This done on both sides he  
stretches his neck out and  
then down bringing his body  
parallel to the earth and cocking  
his tail in the air.

He has the habit of standing  
with body at a right angle  
to legs at times especially after  
working.

He walks now with no  
unsteadiness at all.

July 3, Monday

Water gauge at 6:30 a.m.

1 ft. 6 in. Temperature 50°.

Very cool and pleasant this morning

The mountains stood out clear and bold and islands in great

Salt Lake were clearly visible. It remained cool until after noon.

After breakfast we went out 3 1/2 in the launch.

Many *Cominurus* Zed still in pairs were in the Cloughs.

Water in the bay was deep 7 or 8 inches was the average throughout.

Toward the west side the water was clear of

grass and we went on down to Slaughter Point without difficulty.

Hundreds of great carp were feeding here in the shallow water.

Very few ducks were on the bay.

Flocks of *Cominurus* Zed and Pintails drakes were in the

head of the bay and Pintails in small bunches present continually.

[We crossed to Slaughter Point and worked rapidly through the

rookery banding all young birds, Snowy and great Blue ones that

were large enough. An all one hundred bands approximately were used.

Young birds and Snowy Terns still

able to fly worked in out ahead of us and were caught

two or three at a time banded  
and released. Elbis were tame enough  
and seldom objection; when released  
they often walked away for a few  
steps sedately and then turned  
to watch us. Snowy Terns  
were vicious and struck and  
squawked at us. My left hand was  
bleeding in a dozen places when  
we were through!

On the south edge of the  
rookery I suddenly stumbled upon a  
sick pintail a drake. It lay  
at the edge of the rushes and  
tried to flap away by aid of  
its wings. Not far away was  
a dead Mallard and a pintail  
dead within three or four days.

We ate lunch on Sledge Point  
and then went up down the  
Sledge Point against working the  
island and the shore line west  
for two miles. I picked up a  
male Redhead and a pintail sick  
on the island and saw dead  
a female Redhead and one young  
4 days old. In the water I saw a  
short distance lay a dead  
goose immatures. The dead  
birds had died apparently the  
night before as they were still  
in rigor mortis. All had  
died of the duck malady.



Further on along the shore we  
picked up a Redhead half grown.  
Two dead coots were seen and  
two dead Mallard. Two coots  
were seen affected and two  
sick about picked up.

The water here was  
shallow and clear. No

Potamogeton grows from a point  
100 yards east of 2 lights  
Island in west indicating  
strongly brackish conditions. Ordinarily  
the water is fairly fresh but  
a slight south wind brings  
in salt water. The bottom sand  
is salt.

If an organism (bacterium  
or protozoan) is responsible  
for the trouble, it is one that  
requires brackish conditions for  
its existence and multiplication.  
Fresh water must destroy it or  
render it innocuous.

The feces of the young Redhead  
were fed, strongly so. The others  
were not abnormal in that  
respect.

Two or three hundred immatures  
are feeding in here and  
it is liable to go hard with them.

We left about five and went  
in up the bay. Reached the gun club  
about six thirty.

Received instructions this evening  
to do no ~~field~~ work on ducks,  
Chickens rented for this notice but  
to occupy myself with food  
of ducks & shore birds, duck census  
& survey of food plants.

July 4, Tuesday.

Worked at the laboratory this day until 3 P.M.

The two Pintails brought in yesterday were put in with the ducks in pen 15 (rich meadow) and this morning were swimming about with the other ducks.

The Redheads when brought in were unable to stand or move about & placed them on a sheet of paper on the laboratory floor. ~~The~~ Red Pintails, Redheads and Avocet all have absolute paralysis of the membrana nictitans. The Pintails when secured seemed "pop-eyed," a characteristic appearance in sick birds before there is much mucus discharge from the eyes and due apparently to swelling of the Harderian gland.

The Redhead both had severe mucus discharge from the eyes. The adult was unable to hold up his head for more than a few minutes at a time. For the greater part he lay with head extended before him on its side appearing as if dead save for his breathing.

On giving him water I use a funnel tube with a five inch stem. I cut down a ten inch tube in making this

and rounded the broken edges  
in a flame. I put up his head  
open his bill and insert this  
gently in his throat pushing it  
down until the base of the funnel  
comes between the two halves of  
the open bill. Then I pour water  
in slowly until the funnel is  
half full. Usually it is necessary  
to pull out the skin of the  
neck <sup>on</sup> front and work it  
back and forth slowly to induce  
swallowing. When the funnel is  
empty I fill again. When again  
empty I pull the tube out  
but still hold the head up  
until it is certain that there  
is no water in the throat. If  
the head is dropped at once  
there is danger of water flowing  
forward and flooding the  
epiglottis.

For the small Redhead  $\frac{1}{2}$   
grown I used a <sup>3/4 inch</sup> medicine  
dropper. This I inserted in  
the throat until the bulb  
came between the mandible and  
they squeezed out the water  
and withdrew the dropper. This  
I filled and emptied twice. This  
Baby Redhead improved rapidly.  
By afternoon it was attempting  
to clean itself up. It was

able to move the head over  
the back and manipulate its  
feathers but could not bend  
the head forward and control  
its movements to preen the  
breast though it made many  
attempts to do so. This indicates  
paralysis of nerves controlling  
forward extensor muscles. The  
legs and wings are also partly  
paralyzed.

In the evening I attached  
a "party" at Wells.

Mosquitoes around the Bear  
River Club guide house were  
extremely vast. There were <sup>very</sup> ~~many~~  
cows and ten calves in the enclosure  
and they kept running about  
nearly frantic with the insects.  
Each time they passed the door  
more mosquitoes were added to the  
hungry horde attempting to get in.

July 5, Wednesday.

This morning I was up at five and left in the launch with Bosley and Corinne at once. It was intensely hot on the river and in all day through the ride on the river in the early morning was cool and pleasant.

Many pairs of Cinnamon Teal were still on the river and I saw eight or ten pairs of Gadwall. Two broods of mallards just to fly were noted and one of Cinnamon Teal. Broods of young Red head Gadwall and Cinnamon Teal were noted. I shot a pair of Blue-winged Teal securing the two at one discharge.

On Corinne I mailed some packages of specimens and on Express boat talked for a few minutes with Mr. Clarence Gehney and Mr. Evans.

We hired a horse & buggy from Mr. E. R. Nadley and drove down through the slough west of Corinne to make a survey of Duck pools and see what Ducks were present. These sloughs in the main follow the course of the river and are oxbow loops that have been cut off for a long

from the main channel for a long time. Some of these are probably old channels left when the river has changed its course in part.

The first of these sloughs known as the Town Slough lies on the outskirts of town. It is a body of open water with a considerable growth of *Potamogeton pectinatus* in it. The banks are well pastured. This water lies too near town to be much frequented by water fowl.

West of this lies the Judge slough connecting with the town slough and near it. It is similar in character to the town slough.

At the bend of the river below Corinne is a small grove of boxelders and willows known as Myers grove. To the east of this is Horseshoe slough more than half a mile long.

In this an old ox bow loop are growths of round *Scirpus* (394) growing abundantly. A *Potamogeton* (386, 395) was abundant also

its leaves floating on the water surface in part and in part submerged. In some places this had thrown flower stalks. This plant grew at

The borders of the ponds as a fringe. *Potamogeton pectinatus* was very abundant growing together in the water. With it in shallow water was much

*Myriophyllum* (418)

Shallow water and the fringing shoreline were covered with growths of *Sciurus americanus*. On either side of the slough were alfalfa and grain fields. Salt grass

*Distichlis spicata* was abundant near the water's edge. Large areas were grown with *Hordeum jubatum* furnishing abundant seeds. *De Rumez* (403) was abundant

On the dry banks of the sloughs were milkweed (380) *Melilotus alba*, *Lactuca integrata*, *Lactuca pulchella*, much pigon grass (367-368) and the *Chenopodium*. All these were abundant. Common were *Xanthium echinatum*, *Sonchus asper*, wire grass (391) covered large wet areas.

*Melilotus officinalis* was fairly common, there was some rose (387) *Phragmites* and *Utricularia strigosa*. *Helianthus scaberrimus* were found.



The following were common in  
the growth on dry banks above  
the sloughs.

409.

405.

396.

393.

392.

388.

385.

406.

408.

a rye grass (389)  
grew in clumps in wet localities.

a primrose (401)  
was common in the fields on either  
hand.

(402) A small foxtail like grass  
found  
a mat in some of the poorer  
drier soil. Already it was burned  
brown in its sun.

The following were fairly common.

399.

400.

404.

407.

410.

On some knolls here  
further west on unbroken ground  
was a low scattered growth of  
*Sarcobatus vermiculatus*. I saw  
a few cactus (*Opuntia* sp.)

scattered about among these shrubs.  
Alkaline flats were covered with a  
poor growth of *Salicornia rubra*.  
Beyond them we came to  
two main sloughs known as  
Long Pond and Shallow Pond.  
Vegetation about them did not  
differ from that described for  
Horseshoe slough.

Still further down was  
a very deep oxbow loop known  
as Dead River. The two ends of  
the ~~Horseshoe~~ were separated from  
the river by only a narrow space.  
About this slough were  
considerable growths of *Salix*  
*Guygidaloides* with some *S. exigua*.  
The wild rose here formed dense  
thickets. I saw a number of  
plants of thistle and a legend  
1398 I was

fairly common. With the addition  
of *Radiola hispida* and *Tissa*  
*sparsiflora* (weed) the vegetation  
was like that of the other sloughs.

On general these sloughs  
show plainly in their more  
varied vegetable growth that  
they are fresher than the  
areas in the delta of the river.

Returning to Corinne once more  
we drove out another road to  
the Flume pond. This is a  
shallow depression filled partly by

irrigation, seepage and partly by  
a spill from the Bear River canal.  
At Bay Benatto a bluff 40 feet  
high. The surface of this was  
crusted with alkali that  
had washed out and the  
pond and its shores appeared  
strongly alkaline. *Sarcobatus*  
*americanus* and *Distichlis spicata*  
were the most characteristic growths.  
With the usual *Salsola rubra*,  
*Lonchocarpus*, *Rumex*, *Chenopodium*  
etc.

Booby utts are that sick  
ducks were abundant here in  
1910, 11 & 12. Some of these birds  
were brought up to the town  
sloughs just beyond and it  
was supposed that they recovered  
as they disappeared. Sick ducks  
were known in another pond  
called Salt Pond below here but  
not in the lower, Judge or Horvath  
sloughs. Long & shallow ponds of the  
Dead River.

We left Corinne for Duckwell  
in the launch about six and  
arrived about 10 minutes of nine.

July 6, Thursday.

This day I spent at the laboratory working up notes, plant specimens etc.

Webb is talking of introducing cattle into the enclosure here.

This day Bosely dug holes for a cross fence that will cut us off from the upper part.

Davis has now 2 cows and eight or nine calves down here pasturing at present about the Guide houses.

July 7, Friday.

Temperature at 6:00 a.m. 72° -  
The sky was lightly overcast  
all day. There was little breeze  
and the air was damp, a  
combination of conditions that  
made the heat almost  
unbearable.

After breakfast we took a  
launch and went out 3 1/2 in  
the launch towing a rowboat.  
There were about 200 Common  
Seal gathered near the mouth  
of 3 1/2. About 100 Mallards  
were a little farther out in the  
Bay. Pintails all drakes were  
common in small flock. About  
500 were seen during the day. One  
young bird was picked up dead  
and my female was found.

Redhead have almost disappeared  
a dozen pairs and a few young  
were the only ones seen. Two  
or three male gadwall were noted  
with small flocks of Pintails.

We crossed from the end  
of the channel directly to Slaughter  
Island. The channels were fairly  
clear of Potato moss here and we  
had no trouble. The intense heat  
of the day raised a large amount  
of Potamogeton and large areas were  
covered by mid afternoon that

were clear in the morning. The  
water through here ran right to  
ten inches deep.

On Slough Island I  
found one sick Redhead a  
female. This bird showed the  
characteristic paralyzation of  
the membrana nictitans, it was  
thin in body and quite  
active and was I think on  
that island at the same  
time as the others found on July 3.  
One sick coot was noted but  
nothing else. No dead birds were  
about. Apparently there was a  
sudden outbreak here that  
was as sudden as it began.  
Great flocks of Shorebirds,  
were feeding in here. I killed  
two of these Western Sandpipers  
here with two shots. About  
were abundant of sandpiper  
Dowitcher, & least Sandpiper.  
We returned to the laboratory  
at 3:00 and I worked until  
dark in the birds secured.

July 8, Saturday.

Today a south breeze lifted the heat so that it was not so oppressive as yesterday.

After breakfast I went out Brown's overflow and made a survey of the plant life that might serve for duck foods. The most important was *Potamogeton pectinatus* that filled all the bays. There was considerable *Myriophyllum* here too. *Cirpus americanus* was abundant. Great areas were covered with *Distichlis spicata* and with *Hordeum jubatum*. The latter now is opening its seeds. The hard seeds are blowing about every where. Masses of them water soaked are in the water. These seeds are mischievous things that work into my socks and scratch fearfully. Once started the joints work in through. *Puccinellia maritima* was abundant. There were great growths of cattails. *Salix amygdaloides* comes far down the overflow. *Salix exigua* was less abundant. The latter prefers drier localities than the black willow. *Xanthoxylum* *schumacheri*

and Rumex even very abundant.  
There was much Pigeon grass  
and Chenopodium. The plantain (384)  
was fairly common. Lactuca  
pulchella was in full bloom among  
the willows.

Returned via Kundsams # 2.

Over Browns & Kundsams were  
about 150 Mallards, mainly  
young and 250 Common Teal.  
Returning I ran out the Kendall  
Canal.

Along the shores were  
Distichlis spicata & much Puccinellia  
~~matthiana~~, ~~and~~ S. The grass  
was sprinkled with Lactuca  
integrata. I saw also Melilotus  
officinalis, Broad leaved big flowered  
Asclepias (see 390) and Radix  
hispidus. I collected an inch  
pin (# 417)

that I have not seen elsewhere.  
A floating pondweed (414, 415)  
I have not seen before saw here  
at the mouth of the canal  
is a big bed of Phragmites  
phragmites. Scirpus americanus  
stood here in great growth  
5 feet tall.

Mallards were molting in here  
in abundance.

Set posts for fence this afternoon.



Rubbing the powdered down patches on Oswald imparts to my finger tips a smoothness equal to that given by some skin cream. There is nothing greasy about its feel but it makes the skin (roughened by work and hard water) smooth and pleasant. On old skins the powdered down are very greasy but in this living bird they are almost dry. Oswald uses them in preening his feathers entirely and has since I first noticed them (about June 21). An oil gland is appearing now (first noticed July 7) I can feel it as a small lump apparently the nipple that is firm and smooth to the touch. He allows rubbing and the powdered down patches without seeming pleasure but objects to other petting. Only the domestic dog and cat allow promiscuous fondling and that comes perhaps from long familiarity with man's caresses. Few wild animals when domesticated care for indiscriminate petting and stroking. The early use of these powdered downs and their appearance before the oil gland might indicate that they are a primitive structure.

developed ~~these~~ for the care of  
feathers long before oil glands  
appeared. This would go far to  
explain their appearance in  
isolated groups with ~~but~~ no  
apparent relationship. As ~~at~~  
primitive character they might  
through some carrying power or  
potency of inheritance crop out  
apparently at random.  
It will be interesting to examine  
young horns & see how early they  
appear.

July 9 Sunday.

Cool and pleasant this morning.  
Had a swim this morning  
early and found the water cool  
and bracing.  
After breakfast I went part way  
out  $3\frac{1}{2}$  taking Dr. & Mrs. Part who  
are home for the day out with  
me.

Today we stretched the  
wires in our fence. It was  
not such hard work as I  
had imagined.

Oswald begs to come inside  
every evening when the  
mosquitoes get bad. I bring in  
his box and he sits in it  
or his wood box where defecations  
will not white wash our floor.  
Last night he seemed full of  
life. Everything in sight was  
scrutinized with scanning neck  
and alternately raised and  
depressed crest. Finally he seemed  
to feel some growing instinct  
to hunt within them. He stood  
watching alertly beneath them  
as though waiting for fish in  
some pool. His neck was extended  
and withdrawn and his head  
turned from side to side with  
nervous intensity. After a minute  
spent thus his head would

start out and he would touch  
a nail head with his bill or  
seize for an instant the side  
of his box. I tied a bit of  
wood on a string and ~~threw~~  
threw it to him. He struck at it  
several times and finally seized  
it. Then we played for some  
time, he catching the wood  
expertly as I swung it to him  
holding it and then releasing it.  
Finally he got down on the  
floor and I snapped the  
stick out to draw it back in  
little jerks. This excited and pleased  
him greatly. Sometimes he crept  
out stealthily toward it. I then  
again waited until it crept  
near and then struck it  
swiftly.

The oil gland has grown somewhat  
but he makes no effort to use it.  
At dusk he likes to come over  
and perch near me and have  
me ~~for~~ rub his powder down  
patches gently. When displeased,  
by mosquitoes or by getting  
he shakes his head opening and  
closing his bill with a low rattle.  
Or at times seizes my fingers  
gently and pushes them ~~away~~  
away.  
He catches mosquitoes in his  
bill and then tries to swallow  
them. He watches these insects

intently and even reaches  
over to pick them off my clothing.

Tonight several times he  
seized my trousers leg and  
shook it ~~and~~ playfully.  
In defecating if the cloaca  
is full he bends forward and  
shoots straight out behind.  
Of ~~these~~ excrement is mainly  
urinary white wash as it is in  
4 cases out of five. The posterior  
portion of the body is elevated  
and brought down with a  
sharp jerk so that the last  
of the fecal matter strikes between  
his feet.

He strikes his feet one upon  
the other to give mosquitoes away.

He has brought up a good  
many twigs about the floor  
and when I play with him  
arranges and rearranges them  
calling Kik Kik Kik constantly.

In the dusk I find that  
his eyesight is not very good.

This afternoon I examined a  
sick gull out in the grass  
and Ueward was much interested.

He ran up and then stood watching  
intently beside me. I thought at  
first that he was going to strike  
it but he paid no attention  
to me.

He shows a keen discrimination  
between people. He likes me very  
much and permits me to handle  
him and do various things.  
Ray he tolerates. Unless he will  
have nothing to do with but  
runs up and squeaks and  
strikes at them. I though  
accustomed to Joe still he does  
not like him. When strangers  
are about he is bound to get  
at them. I stand between him  
and visitors and he cranes his  
neck around + tries to get past  
and get at them.

July 10, Monday.

Very hot this morning but cooler this afternoon with a pleasant breeze. Water gauge 1 ft 8 1/2 inches. I worked at the laboratory all the forenoon and part of the afternoon on plants and plant survey notes. The rest of the day on general notes.

Bozley did odd jobs, fixed the water gauge, finished the fence etc.

Oswald was much excited this afternoon at a frog that Ray brought in. He seized it and shot but was afraid and would not eat it. When he dropped it Ray picked it up and Oswald seemed afraid to have it near him. It stood up waving his wings and calling emphatically to get out the door.

Toward evening the frogs came over and Oswald watched them closely. He was half afraid several times threatening to attack them and then retreating. Toward evening he made a long flight of 300 yards. Returning he alighted on the laboratory.

This morning he discovered the river and stood watching

intently in the water for an hour. Occasionally he erects his bill and withdraws to resume his intent gazing. When I came near he retreated as though afraid that I would put him in.

I fed him now morning and evening and give him water after each meal and at noon. He drinks half a dipper full each time. I give him this amount in two portions. Otherwise he chokes.



July 11, Tuesday.  
Water gauge at 7:00 a. m. 1 ft 8 <sup>3</sup>/<sub>4</sub> in.

Very hot all day with little breeze.  
Sky clear.

After breakfast I went down Channel  
2 and across into East Pass.

On the lower part of Channel 2  
there is considerable growth of  
Potamogeton pectinatus leaving only  
a small channel. East Pass  
and the bay across to Mud  
Point was covered with  
Potamogeton and the yellow moss.  
This plant growth has banked  
up the water and save at  
the mouth of the overflow it  
was clear.

I searched the rush stands  
in East Pass but found nothing  
until I got down to the  
Pass leading to Davis Island.  
There I found one sick Pintail  
lying in the water. There were two  
dead Redheads here a male and  
a female and one dead coot was  
seen.

would be a pleasant place  
to spend a week.

The fish hatchery is supplied  
by a spring of clear, cold water.  
Rain bow trout are raised and  
sold on the market for food.

From Mantua we went on  
up to the hill above Dry Lake  
half way to Logan. The character  
of the vegetation remained about

the same. Here we were  
east of the first range of the  
Wasatch. The hills were as  
steep on this side as on the  
west face. So that the front  
range is a knife like hogback.

Returned to Brigham City  
supper, then to Grimes. Arrived  
at the laboratory at midnight.

July 13, Thursday.

Very hot all day today. The wind came from the west so that there was no draft in the laboratory making it seem warmer than it really was.

This morning I unpacked and checked up the binocular microscope that came yesterday. Started some histological material through the alcohol.

I found something wrong with the focusing attachment on my binoculars and was two hours in remedying it.

In the afternoon I sent Bosby out No. 3. He reported a large number of chucks there. Many of them flappers. I brought in one dead green wing dead from the duck smalpathy.

I did not get my material all embedded until about ten in the evening.

July 14, Friday.

Water gauge this morning  $11\frac{1}{2}$  in. The water is dropping rapidly and bare muddy shores were appearing along the river banks. The bottoms further out in the river I find is hard and firm.

The sky was fairly overcast this morning and the air was fairly cool with a south wind. Went out  $3\frac{1}{2}$  in the launch and then in the rowboat worked from the head of the bay to Laughlin's Island along the rushes. The water was very deep all along here and in some places was over my boat.

A great many ducks have come in recently. At least five thousand Pintails are on South Bay. So far as I can tell all are drakes. Some are still only half in shape. About 500 green winged Teal were seen today in addition. On the rushes along the west shore were great numbers of flappers. A considerable number I saw out in the open water. As I came near they went into the rushes like so many little steamers each duck throwing water with feet and wings. A bank of ducks mainly Pintails with a few green winged

Teal, Redheads & Spoonbills, extended  
across from Slaughter Island to  
Ladies Island.

I saw one Dick Pintail  
that I could not catch and  
found another on Slaughter Island.  
The following dead birds were seen

Redhead	##	3
Pintail	##	4
Bluebill		1
Mallard		1
Coot		2
Puddy		2.

(All 2 dove on coot & one Pintail  
lay on Slaughter Island.

About four P.M. a heavy  
wind ~~and~~ accompanied by a  
slight fall of rain came up from the  
south. Before it struck about  
1000 crows came in from down  
the bay and dropped in behind  
Slaughter Island and the bays  
inland were they were sheltered. Others  
came in during the early part  
of the storm. Northern Phalaropes  
seemed to mind it little as they  
continued to fly back and forth.  
The water rose almost  
instantly near five inches and  
foamed back in through the  
brushes.

After watching the storm  
pass up along the

Promontory Range we rounded out  
and started down. We crossed  
two short bars forming a triangle  
and spread a bit of canvas  
on them with this Indian sail  
we came up to the Ranch  
in about 35 or 40 minutes.

July 15, Saturday.

Sent Bosley to Corime today in the launch for supplies etc.

This morning the sky was heavily overcast to the southward and about eight it began to rain continuing until eleven as a steady downpour that rendered the flats muddy and slippery as usual. The barrena that when dry are encrusted with alkali need a slight amount of moisture to soak them up and render them veritable mudholes. This mud is slippery so that walking is difficult and clings to one's feet like true gumbo.

About two in the afternoon it cleared and the mountains stood out clearly all around.

Mosquitoes were extremely bad all day. Whenever I went out clouds of them hung to me and many came in on my clothing so that I was fighting them inside all day long.

I worked at the laboratory all day.

Under the bridge a great school of chubs (*Lencicinus lineatus*) was jumping all day. They lie in the water below the surface and rise rapidly with a spiral break water at the surface and

then go down again. This  
makes a sucking noise rapidly  
repeated. I have noted this all  
three summers that I have worked  
here. The water is deep there and  
swift. The fish are wary and  
just when any one passes the  
bridge I throw in a line and  
caught one when the others disappeared  
nor could I get another bite.  
These fish were of all sizes from  
minnowys up to full grown.

Lowald was much interested  
in them and spent most of the  
day standing on the bridge  
and watching them intently.  
He crossed to the opposite bank  
where he could reach the  
water. I do not think that  
he managed to catch any.  
I caught one and it flapped  
on the bridge. Instantly he flew  
up pounced on it and swallowed  
it with great excitement. I  
fed him half a dozen getting  
him spear them in a pair.

On this evening he was  
rather wild and flew up on the  
house ~~where~~ and would not  
come down.



July 16, Sunday.

Very warm today but the mosquitoes were quiet so that I was hardly troubled at all after yesterday it was a welcome relief.

In the morning we prepared a platform just for John Chickens bought yesterday from Fred Hansen. These I will use in some experiments. For them I used plain platforms without a hole but for a dishpan. Two platforms were completed for them. This work and other odds and ends consumed most of the forenoon & early afternoon.

Wrote and read for the rest of the day.

In the evening visited at Sackett's.

This morning when Oswald was on the roof of the Clubhouse outside my window. Later he walked up on the ridge and finally flew across to the laboratory where I fed him. Then he disappeared and I thought that he had left for good. But in the evening however he returned to roost. He was rather wild all day.

July 17, Monday.

water gauge at 6:30 a.m. 1 ft. 11 1/2 inches. temperature 66°. The sky was overcast part of the day and we had a slight sprinkle of rain. Last night there was quite a shower in the middle of the night. The downpour was accompanied by a heavy electrical display. In the forenoon I went down to the mouth of No. 3 in the cove. There were many ducks gathered in here; several hundred Green-winged Teal were seen and in the grass and rushes were numbers of Green-winged Tattlers. I shot two of each male and a female. From examining these I find that the primaries & secondaries are shed while the coverts & tertials remain (save for a few) for a time longer. One of these birds had the flight feathers just appearing as blunt ended pencils while the coverts and tertials were almost intact. The wing has a curious shortened look. On both sexes wing claws remained on the hallux.

I found a dead Pintail and a dead Common Seal both adult males. No sick birds

Were seen.

A young young and a young Redhead were captured. *Colaptes auratus rubra* while making its growth it is bright ~~orange~~ bright green with a hint of grey in its color. As it ripens it turns a beautiful dull red thus meeting its specific name. The plant during growth is fleshy and succulent. The pulp has a very strong saline taste.

Until five o'clock the laboratory was intensely hot. Then the wind shifted north and it became cooler. Oswald was not about when I came over first but appeared after breakfast. I caught two Chubs for him.

Then he was gone until 5:00 P.M. I was sitting in a window reading when I heard him call. Looking out I saw him descending from a flight about 40 feet in the air and swooping and hawking as he came. I went out and he seemed most glad to see me. I sat down and he built me of his stick nests stopping to seize my fingers gently with his bill and calling Kik Kik

(the food call) constantly. Frightened  
with his sticks he crouched up  
close to me expressing great  
pleasure apparently at a little  
companionship. I began fishing  
for chubs and fed them to  
him as fast as I caught them.  
He seems afraid to be near  
the river when I am on the  
bank and stays back near the  
laboratory. At the sight of  
such fish he came running  
up with flapping wings  
struck it with a loud  
sharp squeak and then  
swallowed. Six good sized fish  
he got away without trouble.  
The seventh stuck in his throat  
several times and was regurgitated.  
I had to give him a drink of  
water before he could get away  
with the eighth and the ninth  
he refused utterly. He picked  
it up & carried it about  
but after several trials at  
swallowing shook his head  
from side to side violently in  
distaste and then merely  
sat looking at it.  
Absolutely filled up he  
walked over and flapped up on  
a pin. He remained there until  
after supper when the wind

flushed and he went into the  
willows behind the laboratory  
for shelter.

He is beginning to hawk a little  
now and giving only the first  
part of his crow. Kamp-Kamp-Kass  
Kam Kam is the full crow  
~~Now he~~ — — — — — Now  
he abbreviates giving only the  
first three.

July 18 Tuesday.  
Water gauge at 5:00 a.m. 1 ft 11 <sup>3</sup>/<sub>4</sub>  
temperature 55° F.

Today was an exceptionally clear day with the mountains far to the south standing out bold and prominent. Directly over Fremont Island beyond Stansbury Island lies a range of mountains that is called the Aguin or Stansbury range by some while on the land office maps it is given as the Anaguin range. Three peaks show together the highest of which must be Black Mountain. Great snowbanks were plainly visible on its northern face today.

The Promontory Range stood out in all its barren grandeur. Squares of dry sand what stood out marked as clear patches of brighter color by the rippled grain stalks. Elsewhere was the plain greenish gray of slopes covered with Sage brush varied by brown, brown red and purple of rock and shadow.

The Wahatch from Brigham north to the narrow gap where comes Bear River into the valley resembles some huge reptilian creature. Crouched along

with its head to the north.  
Along its giant sides great  
ridges of rock - barren of trees  
stand out like huge ribs beneath  
a naked corrugated iron  
skin. An animal half submerged  
in the plain of the valley is this  
~~so~~ monstrous that it is  
revealed in outline only detail  
being too immense for the  
eye to grasp.

After breakfast we went  
down 3 1/2 and crossed directly  
to Slaughter Island. The air  
was clear and tonic and  
the whole day pleasant and  
enjoyable. I took several pictures  
of the way to the south  
in an attempt to show the  
mountains. Antelope Island  
stood out clear and beyond it  
the Ogden Range with the  
Smelter at Garfield throwing a  
long streamer of smoke clear  
to the Ogden notch in the  
mountain side.

On Slaughter Island I found  
the following dead

Redhead	1 young
Ruddy	1
Coot	3
Auvert	3
Spoonbill	1.

Crossing to the mainland we  
 worked the shore line for about a  
 mile and a half. Receding water  
 had left a bare strip of mud  
 from 100 to 300 yards wide to  
 the westward. There were a good  
 many dead birds here viz.

Coot	7
Redhead young	4
" adult	4
Ruddy	3
Avocet	37
Pintail	8
Mallard	1

The water has washed in  
 here in some south storm in  
 the last few days and all these  
 birds have been washed about  
 Most of them appear to have  
 been swept in from the bare  
 mud in front.

We secured 2 female Redhead  
 4 Avocet + 2 coots alive.  
 Practically all of the avocet seemed  
 immatures.



July 19, Wednesday.

Worked at the laboratory today  
all day. Had breakfast a little  
after six and worked twelve  
hours a large part of the  
time at the microscope.  
fairly cool today.

July 20, Thursday.  
got an early start at the  
laboratory again today and  
spent all day in examining  
blood etc.

I find that  $H_2S$  is  
a gas is a strong poison  
that it affects the nerve  
centers and causes conjunctivitis.  
This will be something to  
experiment with as this gas  
is abundant here on the marsh.

Have planned a box in which  
birds may be subjected to the  
fumes of this poison.

Oswald came back last  
night for a short time at a  
couple of clubs and then left  
again not returning to roost.  
He was a little wild tonight.  
This bird is distinctly smaller  
than other Hrons. Something must  
have been lacking in his food.  
He flies easily and readily. He  
has visited Sacketts, a mile  
below. He is much interested in  
the clubs in the river and  
stands on the bridge watching them.

July 21 no Oswald tonight.  
July 18 I brought up another  
Great Blue about half grown and  
Oswald Squawked and stuck at it

July 21, Friday.

Worked at the laboratory again today.

Very hot.

Arranged some new experiment pens etc.

Day gave the young Great Blue Heron I brought up July 18 this and then injected carotids and jugulars with a 1% solution of Methylene Blue in warm Normal Salt Solution. Preserved the head & neck for further dissection & made some notes & one drawing of the viscera

July 22, Saturday.

Very hot today. Went out 3 1/2 and crossed to Slaughter Island and was out all day.

I collected seven jars of black mud today that contained a large proportion of  $\text{SH}_2$ . This gas is found in pools of clear water. The surface mud in them for 1/4 to 1/2 inch is thin grey mud. Below this is a layer 1 to 4 inches thick that is very black & contains a large amount of decaying organic matter. This when stirred up gives off a strong odor of  $\text{SH}_2$ . One jar was taken from the south shore of Slaughter Island. Three others were filled near Neely's Island. Here for a large area the surface mud is grey white underneath is a stiff clay layer 2 to 6 inches thick that is black in color that gives off a strong odor of  $\text{SH}_2$ .

On the main island I collected three more jars in small pools among bushes. On one the insect life, Chironomid larvae, Corixid etc was dead presumably from the effects of this gas. And I forgot amber glasses today from the water, the intense heat

and constant smelling of  $\text{EtH}_2\text{d}$   
was rather sick at night.

July 23, Sunday.

Was at laboratory all day today  
worked on birds secured yesterday  
and notes.

Company in late afternoon &  
evening prevented further work.  
Very hot.

July 24, Monday.

Worked at laboratory all day on  
notes & specimens.

This is Mahe' Pioneer day a  
holiday for all.

July 25, Tuesday.

Rather warm today.

Went out Bromis overflow in morning. There were 75 or 80 young ducks at the mouth of the overflow and we caught a number taking off our clothes and going in after them as it was too deep to wade. Young ducks will dive readily to ~~the~~ or walk when they get ashore.

Worked a laboratory in afternoon.  
Visited at Sacketts this evening.



July 26, Wednesday.

fairly cool today with sky overcast for part of morning. The wind blew westerly from the southwest nearly all day. Wind from this direction shook the laboratory but since blocking up the sides and building the store room on the west I find the building much more stable. In the forenoon I went out with Knudsen #1 and put in the forenoon with Bosley in catching some young ducks. We secured 14 ducks, Gadwall, Spermill, Pintail and Mallard and two coots. I have borrowed a fine meshed seine 120 feet long from Fred Hansen and this we stretched across the overflow near its mouth raising it two feet or more above the water by means of ~~poles~~ willow poles. Going below we beat up along a small channel while Bosley worked down a larger one. I drove up about 75 ducks on the first drive and captured four. On the next drive I got five and so it went. Many of the young birds ran out and hid in the grass and rushes. We stripped off our underwear to chase the birds but were forced to put on shirts to avoid sunburn. The young birds swam up to the net and along struggling

to get through and then when  
their heads caught pulling back  
until they were free. An occasional  
one dove and became entangled  
but came to the top at once.  
These I captured. Others doubled  
back after one trial and escaped.  
Bosley got just as not many  
ducks were down his way.

The young cinnamon teal became  
caught in the net during my  
absence and was banded.

Returning I saw a duck's  
head floating in the river at the  
Bear River Club guide house. I stopped  
and after some trouble in the  
wind it was picked up and  
another with it. The two heads  
were those of immature mallards, a  
male and a female. Both had  
been cut off and on both the  
blood had just coagulated. Clyde Webb  
evidently had mallard for dinner.

In the afternoon I worked  
at the laboratory. Bosley goes to  
Corvallis tomorrow so that I  
had to spend an hour and a half  
or more in getting out some  
correspondence and reports. An  
express box of skins, one of skeletons  
& mail packages containing Bird  
stomachs, old boots to be consigned  
and exposed Kodak film were prepared.

I sent in Griseb's Catalog  
after checking it over.  
Fred Hansen was here in  
the evening. He tried to fish  
today but found the wind  
entirely too strong.

There are very few mosquitoes  
now. I don't think they hardly  
bother around the laboratory  
at all.

Usually we had have drifted  
in during the day in our  
clothing and then have hidden  
(away in corners. ~~At~~ Three  
days ago Bosby brought in a  
small Mytila and I released  
it in the laboratory and forgot about  
it. This morning it fluttered to  
the screen door and I released it.  
It had chased out the mosquitoes  
completely together with a great  
host of chironomids that had filled  
the windows.

Saw a Monarch butterfly  
today. Nanessa antiope is fairly  
common. These butterflies have  
local habitats that they frequent  
for days at a time. At present  
for a week there has been one in  
the willows upon my windows  
and another at the east end of  
the bridge. I saw the latter yesterday  
& start at a marsh Wren.

Salt grass on the flats east  
is entirely brown. *Hordeum*  
*jubatum* is in seed and the  
heads are blowing about  
every where.

Willow shoots have made  
a great growth. I had them  
trimmed out of my little  
grove and the place looks much  
cleaner and neater now.

July 27 Thursday.

Clear and warm this forenoon. About noon a rain came up from the south accompanied by heavy wind. Three storms occurred during the afternoon with enough rain to wet the flats. The wind once became so strong that I thought that my south windows might blow in.

Bosley went to Corinne for water and supplies and did not return until evening.

Cook put in a new hollow wire lighting system for me in the evening. A small tank was put up in the storeroom holding gasoline under pressure from this a hollow wire (about 12 or 10 gauge) ran through the wall at the ceiling to a gasoline lamp suspended from the ceiling over the table. This gave a mild diffused light much better than the old one. Worked at the laboratory on notes and preparations all day. Put the microtome razor in order.

Also made some new shelving and rearranged apparatus and chemicals.

to better advantage.

When with a heavy storm  
comes up I lose several birds  
in my pens. Today a  
jubilee sand four young ducks  
died.

July 28, Friday.

This morning the sky was overcast. The air was cool and twice a dash of rain came.

I ran up in the grounds as far as Hansen's and then came back down watching for Magpies. There were several broods along and I secured four. These birds are rare in the lower reaches of the river.

After this I ran down Bronie's overflow expecting to get some ducks but found practically none. They seem to collect in ponds in unfrequented overflow but leave when they are disturbed.

*Phragmites phragmites* spreads by long runners that sprout with roots starting from each joint.  
Worked in laboratory all the afternoon.

July 29, Saturday.

Cool and pleasant all day today. In the morning I went out Channel d in the launch. The water has receded greatly here and the left hand branch barely gives access to the bay. The water across into East Pass was two or three inches deep and was heavily grown with short Potamogeton. Rowing and knee pushing we worked half way across to the first island with such stroke while knee-pushing the boat travelled only during the actual impulses and then stopped dead still. Finally I decided to walk and leaving the boat proceeded on foot. Went in about 2/3 of the way through East Pass. The head of East Pass is almost dry.

Near the mouth of bay I found one sick mallard, two that were found in the first island and another sick one in the second island beyond. Near the first island where a young young coot nearly dead found at about 4/3 ground bay just beyond. One Mallard was eaten by maggots, the other had died yesterday. This might indicate some one spot here where all these birds



had been made sick. ~~Caught~~ the  
whole bay was filled with  
feeding Goshawk, Osprey, & Kingbird  
Wilson Phalarope, Grebe and Ducks  
none of which seemed affected  
in the least.

We caught 1 or 10 young  
Redheads in the mouth of #2.  
I saw one male Linnæus  
Seal today still in breeding plumage.  
It was with a female. It  
might be that completion of  
physiological acts of reproduction  
include the moult of molt  
in the male. I have seen male  
Spoonbill and Blue-winged Teal  
in eclipse still with  
females but rarely. The Ruddy  
has no eclipse & remains with  
the female during rearing the  
young at least for a week or  
two. Geese remain with their  
matters. Desertion of the female  
by the male ~~may~~ in other  
Anatidae may come through  
the necessity for entering eclipse  
plumage.

I reached home with the  
young Eot just in time to  
see a blood smear as the  
bird died. I was certain that  
the heart continued to beat after  
the heart stopped which would

indicate death due to paralysis  
of nerve centers controlling costal  
muscles. This is in line with  
what I have believed.

Put in the afternoon in  
studying making and labelling  
blood smears from sick birds.  
I am having some trouble in  
securing suitable blood drops  
for making smears. Nervulation  
from a small vein in the  
forearm so far but at times  
this leads to undue cutting.  
The bottom has rotted out  
in the 6x12 jar and this  
afternoon Bosley put in new  
wires secured in Corning.

The other jars were filled in  
and covered with fresh rashes  
also.

Tonight I found that the  
<sup>new</sup> <sup>nocturnal</sup> light is excellent for  
use of the compound microscope  
at night. Read and worked  
until ten tonight.

Insects are bad at the  
lights. The various species of  
*Pambolium* give a pungent  
rather disagreeable odor ~~when~~  
when gathered in large numbers  
caught two beautiful moths  
tonight

July 30 Sunday.

This morning we put the third large box in the river. New wire traps were stretched on the bottom. Just as we were ready to put it in I found that the wire on the front was rotting and now wire had to be put across it. This pen was made in August 1914, this being its third season. Racks of bath now surround all of the pens to keep out the carp. grass & marshes were strewn on the bottoms to cover the wire today.

I worked and read and wrote all the afternoon and then worked with the microscope examining blood smears etc until 9:30

Very warm today. In the afternoon I wrote outside in the shade of the laboratory. I have not been able to do this before this season because of mosquitoes. Today they did not bother me at all.

July 31 Monday.

Water gauge 2 ft 3 1/2 inches.  
The current in the river is  
weak now so that boats are  
easily blown out in the stream  
by the wind.

I sent Bosley out No. 4. This  
morning. He reported mud like  
dry across to Lewisford point  
with two or three inches of  
water extending along the beach  
as far as muller's point. There  
were many flocks in the area  
but no sick or dead. One young  
coot found dead. Nothing else  
of importance.

I worked on monthly accounts  
until noon. Wrote until 3 in  
the afternoon. Much dissection on  
a Canada Goose for an hour and  
then finished with correspondence.  
Very hot with little breeze  
today.

Expenditures July 1 to 3, 1916.

Amount available first of month	250.00
Total expenditures	<u>238.18</u>
unexpended balance	11.82
Estimated expenditures for August	250.00

Items of expenditures

July expense vouchers	172.83
Bosley's salary	50.00
Schrumm Johnson Farm 5	4.90
Shaw-hun Co	<u>10.45</u>
	238.18

August 1, Tuesday.

Was up this morning at six. Made two rounds of the duck pens then shaved and had breakfast. Left for Corinne at 7:45 in the launch.

Left Booky to mop out the laboratory in good shape, to work as needed around the duck pens and to build the frame for a new pen.

The day was hot with an overcast sky in the forenoon and one or two slight dashes of rain. It was clear and exceedingly hot in the afternoon.

The river is low. At Corinne it has dropped  $4\frac{1}{2}$  to five feet since May. The water was so low all along that the banks of the stream hid the view of the flats on either side so that there was no view of them.

There were a good many ducks in the river and in any young coots. In one place just below Corinne is a stand of Salix or grass growing thick and dense more than twenty feet tall.

In Corinne I got a haircut and purchased gasoline, gravel for the ducks, bean, corn, meat and chopped meat. After dinner

at the hotel straightened out my  
bill at the lumberyard with some  
trouble and then certified to  
my accounts before the postmaster  
and sent them in.

Talked with Mr. Adams for a  
few minutes.

Had supplies hauled to the  
wharf and loaded up. Left  
Corinne at 4:10. Stopped for  
a few minutes at Hansen's and  
purchased two hens for use  
in experimental work.

Reached Duckville about  
seven.

Cook purchased a gallon  
of floor oil in Brigham for me.

*Sterna forsteri*

On July 22, as we were chasing a young duck in South Bay I noticed a forster tern that attempted to fly from its perch on a bit of drift but was unable to support itself on its wings. Rowing over the bird fell out in the water and was captured without trouble. Saw for a frequent white diarrhoeal discharge (with foamy feces). The bird was normal save in its inability to fly. It screamed Kah Kah harshly and bit savagely but soon with wings tied it was placed in the gut net in the end of the boat. Here it refused to have its head covered ~~but~~ and watched our movements with sharp eye screaming and threatening ~~without~~ with open bill whenever we came near.

On reaching the laboratory that evening the tern was released on the floor and little attention was paid to it after it had been examined carefully and had been given some water. Next morning I placed a small wash basin on the floor with water and put in it a dozen or fifteen minnows to one and one-half inches long. The tern soon discovered the water



and gobbed the minnow greedily.  
All told, it ate more than one  
hundred during the day. The  
bird became ridiculously tame almost  
at once and followed me about  
with bill point up always looking  
for fish. I had purpose to wear  
scarf in walking to avoid stepping  
on the bird accidentally so  
closely did it follow.

For a few days it tried  
to flutter out against the screen  
door and then recognizing it  
as a barrier was content to  
stand and look out. Myself  
or my assistant caused Ind.  
comfort but strangers especially  
children were excited with  
harsh notes. The dog and two  
pigs running at Ind. also  
called forth screams of protest  
but the birds seemed unafraid  
as it did not move from  
its position before the open door.  
Much of the time Ind. was  
spent perched upon the broad  
border of the wash basin that  
formed its miniature lake. At  
first it had difficulty in  
perching as its legs seemed  
weak and it was continually  
falling astride the rim to extricate  
itself with some difficulty.

Twice or sometimes <sup>three times</sup> this time  
a day I gave it small minnows  
in quantities and then it was  
eager for it. It seemed to recognize  
that I was small insects and  
would jump up and  
swatch expectantly. Standing on  
the edge of its wash basin it  
seized the fish with <sup>emerging</sup>  
aim and swallowed them  
rapidly nearly always head  
first. When becoming more  
excited it would hop in and  
with quick stroke of its bill  
clear out the contents of the  
basin. Always it fed with wings  
spread and waving above the  
back. Fish were seized in the  
open fall from  $\frac{1}{4}$  to  $\frac{1}{3}$  of the  
length above the tip. Because  
of this the bird had trouble in  
picking up fish that fell to the  
floor, <sup>usually</sup> half a dozen quick strokes  
being made before the morsel  
was secured. Often it brought in  
fish in the wire screen set in  
which it captured them and  
the tern would in and peck pick  
at them catching its bill tip on  
the wire but always managing  
to get all finally. Any morsel  
that hung to its bill was  
shaken off immediately by  
a quick turn of the head.

After I teased the bird by  
bringing in quantities of flesh  
in a glass beaker. Putting the  
beaker I allowed it to capture  
one or two. ~~That~~ ~~it~~ ~~would~~ ~~the~~  
beaker was placed upright the  
bird would strike at the  
glass entering in endeavor to  
seize the food displayed  
so cheaply. The bird would  
take food from fingers on a  
pair of forceps without fear.  
The bird seemed entirely  
without fear though like other  
birds it objected to handling.  
When I found it necessary  
to pick it it struggled but  
showed no fear of being  
released. When it pointed my  
finger at it it would walk  
it an instant and then strike  
it with its bill.

August 2, Wednesday

clear and hot today with very little breeze. I was up a little after six looked over the duck pens and then cleared out the laboratory and put on a coat of floor oil. This dried rapidly staining the wood work. I was able to put on the second coat before noon but allowed the floor to dry until after supper before putting things in order. This oil will facilitate cleaning up in here. The live birds that I have make quite a mess with excrement etc and for sanitary reasons it was necessary to do something with the floor. I found that I had just enough oil left from the 1 gallon to cover the floor in the storeroom also.

After breakfast I mixed up a new feed for the young ducks. I made it from  $\frac{2}{3}$  bran and  $\frac{1}{3}$  cornmeal added about  $\frac{2}{3}$  of a pound of finely ground chick meat. This I mixed thoroughly separating the particles of meat and adding a very little of water. Finally I put in about  $\frac{1}{5}$  the bulk of grit. Under ordinary circumstances

This would be too much, but  
the birds have been without  
grit for a time. The young  
ducks and coots ate their  
mixture eagerly but the adult  
birds would not touch the bran  
though they ate the meat.

We put the wire on the  
framework for two experiment pens  
next. This is a two man job  
as one is needed to stretch the  
wire while the other nails it.  
We also spotted several more  
pens and rearranged all the  
available platforms.

Bosley made a new drawer  
for the table and painted the  
tight box for experiments with  
glass.

I put the paint in the  
top of the laboratory when I brought  
painting this spring and went  
up after it today. Found it so  
hot up there that I could barely  
stand it. Paraffin that I had  
used to seal the can was  
soft and running from the heat.  
I found out one of the chickens  
that I have been using in  
experiments would not come out in  
the willows refusing to come out.  
Oswald came back for a  
few minutes this morning. He

lit in a willow across the  
river and though I called  
to him refused to come over.  
He seemed very wild. Ray  
says that he came by yesterday  
also.

In the evening I trimmed  
up the willows taking off  
small shoots starting along  
the trunks in order to induce  
growth in the tops. These new  
shoots grow with great rapidity.  
One time it would have a  
fair grove here.

I was interested in watching  
the movements of two butterflies  
today. Both were perching on  
willow trunks in the shade  
resting. Blue bottle flies seemed  
attracted to them by some scent  
as a dozen flies were around  
each and I were continually  
crawling up or lighting near  
the butterflies. Especially toward  
the distal end of the abdomen.  
Each time the butterfly opened  
and <sup>was</sup> ~~was~~ the wings quickly  
frightening the flies away &  
but within six inches of one butterfly  
I could detect no *Francis*  
odor. One butterfly was *Vanessa*  
*anthopa*, the other a black species  
of the same size or a trifle smaller

with a broad white band  
across the inside of wings  
& the outside with white  
mottling & red back brown eyes.

August 3 Thursday

Warm today but with a  
south breeze that tempers the  
heat.

Went down in South Bay  
taking lunch and did not  
return until 3:30 P.M. A slight  
breeze through the willows  
at the (a boundary) - came  
half a gale over the open  
bay. Across the open water  
the wind gets quite a sweep  
and rolls up small waves.

These wash up strands  
of ~~scirpus~~ Potamogeton from the  
bottom of the channels and  
push the propellers of the boat.  
Rowing is hard against the  
wind too as the flat bottomed  
boats drift badly and it is  
difficult to keep them headed  
in the direction desired.

Though normally the water  
around Slaughter Island is  
low the south wind had  
blown in water until it had  
raised two inches at least.

Because of low water the  
salt is raising in the ground  
water in the lower bay. I found  
the scirpus nearly all dead and  
brown on Slaughter Island ~~the~~  
with only small parts of sickly



green in it. The scirpus growth  
at the end of the old river  
channel was affected, too and  
was brown as in fall.

Around Slaughter Island the  
water tasted fresh as usual.  
A footprint in the mud filled  
up by percolation with salt  
water. I dug a hole in the  
mud on the south shore of  
the island, ~~and~~ <sup>six</sup> inches deep.  
It filled with strongly saline  
water at once. I dipped out  
a gallon and it ~~percolated~~ <sup>percolated</sup> as  
salt as before. Two other holes  
a few feet away refused to  
~~percolate~~ <sup>percolate</sup> because of the character  
of mud in them (imperious to  
water).

The large bayou on the  
main island northwest of  
Slaughter was strongly salt  
though the water outside  
was fresh.

Around Slaughter Island  
there were almost none of the  
Corixids and Chironomid larvae  
~~formerly~~ so abundant there ten  
days ago. Instead the  
mud of the islands was  
crowded with *Ephydra gracilis*  
that rose in buzzing swarms  
at my approach.

There were practically no  
Corvids in the large lagoon  
either. A hole chewed in the  
dug out the shore of the lagoon  
yielded a very strong trail.  
In connection with this  
I was struck with differences  
in the bird life. Great flocks  
of gullwit, Dowitcher and  
Western sandpiper are now up  
at the mouth of 3 1/2. Avocets  
(are abundant) around Slaughter  
Island and in the lagoon.  
And with are many Western  
Sandpipers and great flocks of  
Wilson's and Northern Phalaropes.  
These were to be expected. There  
were surprisingly few ducks in  
this region. Occasionally a  
few Redheads among by small  
flocks of Pintails passed coming  
in from the land and they  
were a few Cinnamon Teal about  
but that was all. There are  
not more than one fourth of the  
usual number of ducks visible  
on the bay. Last year in August  
I reported great flocks of  
ducks on the ways. Practically  
no birds now were flying  
off to the southward.  
I found a sick Black Tern  
on Slaughter Island. And picked

up a sick Avocet in the  
lagoon. Bosley picked up a  
sick Redhead (young) and a  
Cinnamon Teal that were in the  
last stages. These two died in  
the boat. Sackett gave me  
an ibis with Duck's ~~stomach~~  
sickness.

I saw a dead Forster's  
Tern along 3 $\frac{1}{2}$ . Caught two  
young Redheads and brought  
them in.

Returned to the laboratory  
about three-thirty. Made  
critical notes on my live birds  
and made a blood smear  
from the ibis. Had Bosley  
arrange a new experiment pen  
for the control ducks. The new  
pen the old one has caked and  
is hard on their feet.

Clyde Webb came about six  
with some visitors and I  
showed them the place.

Collected 8 Avocets for Strickland  
today.

Received a box containing  
three gallons of alcohol from  
Washington this evening.

August 4, Friday

Today has been very warm though a steady breeze has stirred the willows. About four P.M. I sat out on front of the laboratory writing and the wind blowing across the bare alkali flats baking in the sun struck me like the breath of some great furnace. The laboratory itself was very warm.

Toward evening a storm brewed in the south coming finally the promontory range in a dark solid cloud from which came flashes of lightning. Slowly the storm spread until by nine it was above me. With it came a gale of wind a mere whisper of air at first that increased at once to half a gale rattling the windows, shaking the building as though it would overturn it. A light dash of rain accompanied. All day the flats and shallows on the lake front have laid steaming in this blazing sun and with this storm from the south came the breath of the lake an odor ~~that~~ filled the a redolent of great sewers, of horrible, crawling

noisome carcasses rotting in  
filth of things unspeakable  
in their stench and loathsomeness.  
One might imagine ~~that~~ it  
the breath of some terrible modern  
old world battlefield with its  
dead creatures putrid under  
a blazing sun. This smell  
came stronger and stronger  
until it was almost overpowering.  
Now have I found it so strong  
here.

At nine thirty going out I  
saw a peculiar thing. The storm  
bodies had cleared the Promontory  
Mountains leaving a band of  
clear sky above them in  
which hung a sinking moon  
about one-third full. The  
sky above was black and  
a slow rain was falling  
driven in gusts by the power  
of the wind. The air was  
lighted by an unearthly grayish  
light that set off the willows  
buildings and the river in  
a ghostly fashion as though  
daylight was at hand. In  
the east was indicated a  
rainbow the second made  
by reflection of the moon that  
I have ever seen. It stretched  
across the sky as a complete

arch faintly indicated as  
a pale band ~~with~~ lighter  
than the sky. No color was  
indicated. Olf was almost  
illusory in its appearance  
and gazed at for long  
almost disappeared as if the  
retina tired in bringing it  
out. In about ten minutes  
it was fading rapidly and  
soon disappeared.

August 5, Saturday.

The sky this morning was overcast and it was cool.

After a few odd jobs about the laboratory, took launch, rowboat and seine and went up the river and out Kundsun  $\pm 1$ .

Left the launch stuck in one shallow place, and went on down toward the mouth. We placed the net in a loop across the head of one small channel and then drove up toward it. I saw Cinnamon Teal and two Green wings went into the net and I drew the net end across closing the loop. No more could be captured here. Ducks seemed few.

Out on North Bay I could see a good many but still they were not present in their usual abundance.

After dinner I made one or two blood smears and attended to some birds about the laboratory and then with Cook and Bosly went out No. 3. We set the net across one channel in a loop and then Cook and Bosly went down to drive the birds while I lay in the willows

watching. Among the first of  
the ducks to come up was a  
male Bluebill and this bird  
~~was~~ fought the net in an  
endeavor to get through for  
ten minutes in one place. A  
number of flapper Cinnamon teal  
came up headed by an adult  
mallard and these found a  
way around. The only ducks  
that we captured were seven  
Redheads and the Bluebill. More  
came up but due to replacing  
the net and the misguided  
activities of a cursed yellow dog  
they escaped.

Many carp came into  
the net and as Eoot was  
trying to get some carp to send  
up to the fish hatchery for  
bait food we tried making  
a haul for them. Meanwhile  
~~a~~ heavy clouds were banking up  
in the south and a hard  
storm was brewing. Suddenly  
great flocks of about came  
screaming and calling up  
from the ~~south~~ lower bay and  
within five minutes the  
storm burst. First came a  
great gust of wind and  
then a deluge of rain  
that seemed completely to fill



The air. A small amount of  
hail came at first but soon ceased.  
I was dressed ~~in~~ thin  
sleeveless underclothing only  
and the beat of the rain driven  
by the wind stung my bare  
arms and shoulders until the  
skin smarted. We sat in the  
water with only our heads  
out for twenty minutes or more  
until the storm abated. Then  
with chattering teeth loaded the  
seine, and after two or three trivial  
mishaps started back up the  
overflow. A little rubber umbrella  
on the spark plug of the motor  
saved engine trouble as it had  
kept the ~~sp~~ porcelain of the  
plug dry & preventing arcing to  
the cylinder head.

Reaching the laboratory I attended  
first to the ducks that lay tied  
flat and wings under the covered  
front of the launch. Then after a  
brisk rubdown with a heavy  
towel and a snifter of scotch  
I was ready for dry clothing.

A window was open at the  
laboratory but no damage was done.

The pen containing my  
control ducks had blown off the  
platform and turned bottom side up.  
By some chance two of the  
three ducks in it had remained

They had plucked one poor young  
Cinnamon Teal until its rump  
was bare and entirely and  
red and irritated from the  
nibbling of its companions. I  
placed it in pen #36 with some  
sick birds and removed several  
of the larger immatures of birds from  
No. 15 placing them with the  
Mallards in number 1. Here they will  
have to behave as they are in larger  
company.

The Gadwalls are worst  
in this respect. The young drakes  
seem to start the trouble and  
when once a duck is attacked  
all the larger ones pick at it  
until it is in a pitiable  
condition. Not content with  
pulling out the feathers and eating  
them the ducks work until they  
break the skin and then eat out  
the fat around and above the  
oil gland. Of Drakes among  
the young immatures (at least among  
Gadwall and Mallards) may be  
known by ~~the~~ the manner in  
which they nod or bow  
as the drakes do in breeding  
season. Gadwalls seem to  
do well in captivity but are  
rather a bird of no character.  
At least they do not appeal

to me. They seem weak and rather listless. The young when ten days or a week old may be reared readily.

This evening I prepared a mash of bran and cornmeal for the ducks again. This time for meat I used a pound or so of fresh chops. The fish were caught killed and ground up in a meat grinder and fed at once. This made an excellent feed and is better apparently than beef. Even the grown ducks ate this mash in preference to grain while the young mash they seemed to care little for. In bulk it requires more fish than beef to mix this feed as the fish contain more water. I shall purchase a meat grinder for office use as it will save its price in a short time besides saving the worry and trouble of securing ground meat in Corinne. There is danger too of meat spoiling and causing ptomaines when it is kept on ice. With a grinder I can give a supply of fresh meat as needed.

August 7, Monday.

Cool and pleasant all day today. This morning I began these new experiments. Sackett came up about eight with 11 young ducks and 3 sick ones I should purchased at twenty-five cents each. \$3.50 for the lot.

This is considerably cheaper than I can catch them myself. The sick birds I was glad to get. He secured them around second Mallard Point in North Bay. Among the young ducks were five Ruddy. These I will try to rear.

Job (Propagation of Wild Birds) had no luck with his but apparently was trying to keep them on dry land, a procedure that would seem to promise little in birds that can barely stand on land. As always they were impugacious little rascals that nipped my fingers at every opportunity. Plus in the pen with the other young ducks they dove at me and during the day when it happened to look in it would be a minute or so before I could catch sight of me. I lay flat out along the water screens

and were under water constantly.  
I made blood smears from  
the sick birds today staining  
with Giesman's Azur. eosin.

This gave beautiful slides but  
as yet I am unable to  
make out any pathogenic  
organism. Leucocytes and  
what I take to be blood platelets  
show up in abundance. Without  
counting the leucocytes seem  
rather abundant. I have a  
Haemocytometer but the ruled  
lines have worn away until it  
will not serve for blood  
counts. In making smears  
I take the blood from the  
wing about 3/4 of the distance  
from the distal end of the ulna.  
I worked most of the  
day on these slides examining  
them. The stain seemed to work  
very well though I have  
never used it before.

Booby chucked out the  
boats and prepared two  
more experiment pens. Ducks  
were placed in these this  
evening.

The brown stain of algae(?)  
that I noted last year is  
appearing along the river edge  
again. I made a mount of

Some it is this evening staining  
with Methylene Blue. The  
string that of Weber gives  
The color is a slender  
spindle shaped organism. In  
most cases the attenuate  
end of the spindle is bent  
at the tip to the left. i.e.

When organisms are present.  
A heavy stain up the  
valley, tinged with a strong  
electrical discharge.

A chicken 2 months old  
brought over from the house seems  
to have stomach poison. legs  
are weak & will barely support  
bird. ~~can~~ can walk but legs  
spread out in a "jangle"  
or "splayed". Bird cat lying  
on back. gave 1/2 teaspoonful  
of castor oil.

August 8, Tuesday.

Cool and clear this morning. There is a feel of fall in the air again.

Before breakfast I made the rounds of the duck pens and saw to it that every thing was in good shape. Now I have three large six by twelve pens in the river. One has large ducks, one young birds and I had and one preserve for sick birds. Then there are ten experiment pens on platforms all containing birds. I keep my pen at present near the large pens to put birds in temporarily and another smaller one at the laboratory for the same purpose.

After breakfast we went down the old river channel. Ran down in the launch to the mouth of the Ruler Canal. I had thought that it would be too shallow but I touched in one place only. Rowed down the old river channel to the canal into North Bay. The water was deep and the Potomogiton no sink so that we got along without trouble. I can see the effect of pasturing cattle here on the vegetation. The salt grass is shorter and some rush growth has been eaten.

down. I do not consider it  
of great account however. The  
Ducks are down a mile or  
so farther down.

There was a great flock  
of ducks on the old canal  
and many in North Bay. All  
in all however, I do not consider  
ducks more than one third as  
abundant as at this time last  
year. Of this is an index of  
the number of birds for this  
western country it seems serious.  
~~Spotted~~ Birds may come in here  
in abundance later. Should this  
be a marked decrease this  
season however, Spontaneous cannot  
attribute it to the Duck sickness  
as practically none have died  
for two years. 1914 would many  
think was a good season for  
hunting. Any decrease now can  
be attributed only to our shooting.  
I found five dead Pintails  
(all males) one young Redhead,  
one young mallard, one crow and  
four or five immatures Coots all  
swimming a short distance of the  
mouth of the old canal into  
the North Bay. One immature  
Coot was picked up in a helpless  
condition. I worked along as  
far as Long Point but found  
nothing else. One male Pintail



got away in the rushes. It  
may possibly have been a flapper.  
I found a good many sick  
birds here later in the season in  
1914.

The entire bay was filled  
with birds here. Western Sandpipers,  
Godwit, Dowitcher, Wilson Phalarope  
were here in abundance. Also  
Snowy Heron, Night Heron, Yellowlegs  
Black Doves and others were  
common. A flock of 1000 green-  
winged Teal was straggling off  
shore. Yet of these I did not  
find one sick bird. This  
would indicate that the  
trouble here was present somewhere  
in shallow pools in the rushes  
which these birds were not  
frequenting. There were considerably  
areas of semi open water one or  
two inches deep that was  
standing warm and stagnant. I  
brought two pails of this back  
to the laboratory and started  
an experiment with it to test it  
on captive birds.

In the waters of the  
bay were great numbers of a  
jelly like infusoriate. Small ones  
one to three millimeters in diameter  
clung in clusters on the stems  
of Potamogeton larger one 1/4 to an  
inch in diameter, some of them

Nearly an inch long floated on the surface. Great quantities of these had been cast up on shore. I fed five to a young Redhead to test their effect (Experiment 77)

Snails (*Limnaea palustris*) were abundant and I gathered a quantity for the ducks.

~~Returned to the laboratory at~~  
I walked down as far as Long Point. The mud was soft on top but firm below so that going was not hard. The bay behind Long Point was entirely dry. Water in the North Bay here was very shallow.

Returned to the laboratory at noon and worked there until dark. Made blood smears from the sick coot and from a healthy immature still using Gies's azur-eosin for stain.

Fed Tom Redhead the mucus & contents of stomach and gizzard from a sick pintail and up dead this morning.

So another I fed the eyes and lacrimal and Harderian glands. These experiments hardly signify anything as Ravens constantly eat the sick birds and I have yet to see a sick raven.

Gulls do the same and of course then sick gulls but there is no reason to suppose that the gulls are not made sick in the same manner as the ducks.

This afternoon we had then thunderstorms that wet the flats but did not bring a great amount of rain.

In the evening there were some beautiful clouds effects and the mountains stood out a deep purple. There seemed to be heavy rain up the valley.

17th A mash again tonight and even the ground mallards seemed eager for it.

August 9. Wednesday.

Water gauge 2 ft 3 $\frac{1}{2}$  inches. Temperature  
7:00 a. m. 58°. The river has  
come up slightly today. The air  
today was cool and pleasant  
a certain premium of J. H.

Mosquitoes were rather bad  
last night after the rain but  
do not bother now under ordinary  
circumstances.

Worked all the forenoon on  
Notes and caring for the  
birds that I have about.  
Three young Pintail Ducks secured  
from Sechelt Monday were dead  
this morning.

August 10, Thursday.

Today was fairly cool and pleasant all day. I worked at the laboratory all the forenoon. After dinner I went down to the mouth of No. 2 in the launch with J Bosley and James Hull Junior.

The water has gone down still farther here and but little was running out the left hand branch. To the west the Bay was nearly dry across to mud point and there was very little water in East Pass. A considerable number of Pintails and Greenwinged Teal were feeding in here. These birds I believe have just come in to the marsh.

A number of newly dead birds were scattered about. I worked the country at the mouth of Channel 2 and across nearly to the head of East Pass and saw the following dead.

Coot	13
Lesser Yellowlegs	5
Forster's Tern	2
Mallard	1
Redhead	3
& etc	1

Avocet

Green-winged Teal

Green-winged Teal

There were several sick  
birds captured viz.

Pintail

5

Mallard

2

Green-winged Teal

2.

Notes and these follow.

Worked at the Laboratory  
until nine thirty this evening.

August 11, Friday

Today I worked at the laboratory all day. Art Boothe and Son and Tom Johnson were here for a while. Boothe has rented Sackett's gun club for the fall and will run it in connection with Johnson.

The Redheads in the stock pens have killed five young cinnamon teal. Yesterday they did up a female spoonbill. I have decided to build a new ~~set~~ six by twelve pen for them and put them all in by themselves and keep the other ducks separate.

~~They~~ I put most of them in with the Mallards and Pintails but part escaped and had to be recaptured. I had trouble with them all last year.

Rosby went to work at once on the frame for the pen. Jimmy Hull will bring out the wire from Bingham when he comes.  
Cool & pleasant today.

August 12. Saturday.

Cool and pleasant all day today. After breakfast we went down No. 3 and tried to catch some more ducks. There were practically no young birds in the overflow and the few that did come up escaped us.

There were a considerable number of Green-winged Teal and Pintails in the overflow. I searched the banks of the overflow and secured one sick Mallard and Bosley picked up two young ones.

In the afternoon I worked at the laboratory with birds and notes. Bosley cleaned the place up in good shape. In the evening it was quite hot for an hour or two and then a tremendous wind from the south arose that shook the laboratory and caused some anxiety for the safety of the experiment jars.



Sick birds is due to the fact  
that the new arrivals have  
no resistance to the toxic element  
in the water, and they are  
readily affected. While birds that  
have been in for some time  
are unaffected as they have ~~not~~  
such a resistance. The birds  
found today were along the  
banks of the overflow and  
are the first seen in that  
locality this season. This points  
to their coming from the blocks  
that frequent these localities.

Now the coming small  
flocks of seal kept passing west  
of the club house apparently  
going into North Bay to feed.  
At least two thousand Green-  
wings crossed before dark.  
It might be that the birds  
are infected or poisoned while feeding  
and that the effects come after  
they return to the flats to rest  
hence the sick birds in the overflow.

August 14, Monday

Quite hot today without much wind. I worked at the laboratory during the forenoon. After dinner I went out Number 2, there were several sick ducks near the mouth of the overflow here and I found the first island in the head of East pass. Here the water has dropped leaving a considerable area of Potamogeton drying in the air. This seemed a plausible place for infection so I scooped up several pails full of water taking Potamogeton grass and mud sand and took it home for ~~them~~ experiment. A large number of Green-winged Teal were in here at the mouth of the overflow.

Jimmy Hull came down this evening and brought me wire for the new Pullrod gun. We put part of it on the frame this evening. Bosby made a mistake and cut the frame of his gun  $3\frac{1}{2}$  inches too short so that the wire had to lap over.

Hull captured an adult Pied-billed Grebe and I made a blood smear from it this evening.

August 15, ~~Monday~~ Tuesday

Cool and pleasant all day.  
I worked at the laboratory all day. In the morning we finished the pen for the Redheads and put it in the water. It is made of inch mesh wire throughout. Placing this pen setting up the racks and then shifting the ducks occupied nearly all the forenoon. All the Redheads are together now in one pen, the pen is reserved for Pintails, Mallards and Gadwall and another for Seal Coats and spoonbills. The fourth I use for sick birds. This prevents their being crowded by the stronger individuals. As fast as the birds grow strong I place them in the other pens.

The wild birds bidy over the weak ones, or even stand on them if they have an opportunity. Ducks especially, ducks seem to like to stand on some little creature and that this may happen to be a live duck too helpless to move seems to make no difference to them.

Had visitors for a while after ~~dark~~ dinner and then some sick birds were brought in to me.

August 16, Tuesday.

A very high wind from the South all day rendering it impracticable to get out on the bay. The laboratory rocked and creaked all day long. Since I thought the windows would blow in.

Worked inside all day.

August 17 Thursday.

This day there was a violent wind from the south all day. After breakfast we went down 3/2 and picked up a number of sick birds. It was difficult work to handle a boat in the wind. Most of these birds were quite strong. A few more birds have come in here but not many.

August 18, Friday.

This evening it was very cool with a temperature of about 50°.

After breakfast we loaded three experiment jars in the rowboat and took them down #1 wharf we placed them in stagnant water in a barrel net. ~~That day~~ each jar we placed one bird. The jars were sunk in the mud to allow the water to flow in over the 1X4 at the bottom. Placing them took about 20 min.

After dinner I went to the laboratory while Bosley went down to the salt birds enclosure.

Two secured on #1 this evening. One it saw crawl out to shore ~~and~~ a hundred yards away. I started a minute before going to it to take a picture found in that space of time a Californian jull had laid its back open. This bird was later killed by other seal which tore open the space eating all the meat from the vertebrae.

August 19, Saturday.

Very cool, almost cold in fact this morning. We went out <sup>at 8 a.m.</sup> in the morning and directly down to Langheta Island. The salt water had come in here and has cast a windrow of Potamogeton seeds and rubbish <sup>in</sup> on the shore. There were several pools of strongly saline water on the island. I gathered two pintails to use in experiment work also a jar of Potamogeton seeds.

There were half a dozen dead Pintails on the island. Dead birds disappear very rapidly down here. Since the third of July there have been six or eight dead birds found here on each visit. Predacious animals eat them and they rot so that in one or two weeks they disappear.

The following fresh dead were noted.

Pintail	7
Unidentified	1
Calif Gull	1
Ring-billed Gull	1

The sick pintail was captured.

Crossing over to the main shore we got a number more sick ducks. Most

of these were congregated in  
 One salt slough down the  
 water was a foot deep. Nearly  
 all were quite active.

About 25 dead pintails were  
 encountered during the day. A large  
 part of them were females.

We returned through the  
 inside channel to Slaughter Point.  
 There were a large number of  
 Happer pintails, in here and many  
 more about Slaughter Point.  
 All told we secured the  
 following today.

Pintail	17
Spoonbill	2
Common teal	3
Green-winged teal	4
Coot	1
Calif gull im.	1
	<hr/>
	28

Most of these birds were  
 only slightly affected.

For a week the wind has  
 blown hard from the south  
 but today it came from the north  
 all the way from Slaughter  
 Island what was strongly saline

Walked down to Number 1 to  
 visit experiment pens. ♀

Had to shift some ducks tonight  
 in the stock pens also. Have just all  
 sick birds in # 15.



August 20, Sunday.

This morning we banded and released over thirty birds. All were fairly strong. Worked at the laboratory the rest of the day.

August 21, Monday.

Up this morning at 6:30. The morning air was cool with the thermometer at  $48^{\circ}$  but the air was clear and the sun pleasantly warm. No breeze was blowing and the mountains lay in a distant haze. Bobolinks were flying and all in all it was a typical fall morning.

Mosquitoes appeared suddenly in some numbers two days ago and have been bad ever since. I had hoped that we were through with the pests for this year. They are very annoying about the experiment pens.

This morning after sending laundry and mail in town by Sackett I went down to the experiment pens on Channel 1 with Bosley. Because of a north wind the water was receded somewhat and two of the pens had been left dry. Small ditches were dug to lead water in to the trough from the shallows connecting with Birdiel Neck. This water is stagnant saline to the taste clear somewhat tinged with brown. The birds in the experiment pens seemed in the best of health. They were somewhat muddled but cleaned themselves up at once when

water came into the pens, last season I confined two birds in a pen which had a great deal of trouble as they trampled each other in the mud. I believe that even in experiments at the laboratory that it is better to use single birds.

Returning I cleaned up a lot of odds and ends about the laboratory. Dermestes have begun to work in my chest so I packed all the skins ready to send in.

Booby filled in the stock pens where the birds had been digging and covered the dry portion with grass. Several of the Redheads and Pigtails released yesterday were about the pens. After dinner I worked until five steadily on notes. I have had too much company lately and have fallen behind. Am experimenting with yomal salt solution at the laboratory now.

Booby went out Channel 2. He reported that there were few ducks resting there now and that East Pass was practically deserted too. This I attribute to low water here. A north wind for two days has driven the water down. Then too the moss

is going out which has  
considerable effect in damping  
up the water. It is significant  
that he found no sick birds  
on #2 today. Previous to this  
there have been great flocks resting  
on and in the sick birds  
have been found on each visit.  
Apparently then the birds  
come in in flocks and some  
become weakened and unable  
to fly. This would seem  
to indicate a point of infection  
occurring there about the  
months of the overflows. It  
must attempt to find out if  
there is much of an evening flight  
to the south.

August 22, Tuesday.

This morning the thermometer stood at 48° and it was cool all day.

After breakfast I went out Brown's overflow in the launch. The water was high here and there was good drainage into the bay. Many ducks and large numbers of coots were out in the open where they enjoyed an abundance of good food water. There were no great banks of birds though as we found at times. The birds were well scattered. There were comparatively few about the mouth of the overflow. No sick birds were seen at all.

We noted a number of Happer Cormorant, Pintail and Mallards along the overflow.

Returning I went out the Knibb Canal. There were a good many ducks at the mouth of this. One sick Pintail was brought in.

Out #1 in the evening to look at experiment pens. No sick birds seen.

August 23, Wednesday.

This morning we went out in the launch to the mouth of the Nisley Canal and then in the rowboat down the Wet River Bed and across into North Bay.

Lockett and Keller have cut a considerable area of Scaevola here, Scirpus americanus, round Scirpus and some Puccinellia and are putting it up for hay. They have a large stack and are putting up another. This is for winter feed for their cattle. This practice if continued and enlarged would encroach upon the marsh to a considerable extent.

We worked through the rushes from Mulford to King Point leaving me sick greenwing and in a boat only. From King Point there was practically no ducks in sight to the west. Many gulls were walking about on the flats.

I saw a brood of Common Seal as well as old and young Redheads are common. Certainly it would be a mistake to open the hunting season here before October. Also captured a Mallard that was unable to fly.

There are many flapper ducks  
still in the marshes.

I took from the Garfield  
marshes filled the eastern valley  
this morning. To the south  
it formed a line like that of  
fog lasting 200 yards or so  
above the earth.

There were great numbers of  
green-winged teal in the old Pease  
Channel and many Pintails.  
As we came they crossed into  
South Bay.

August 24, ~~Friday~~ Thursday.

This morning it was quite cool again. After breakfast I went down to Pintail Neck to see what birds were being in there and to look at the experiment pens. There were practically no ducks there or in last pass and consequently no sign of sick ones. The birds in the experiment pens confined in water here were all healthy, all have grown.

About 10:30 J.M. Bingham Nelson Perry came down with three sick chickens. He has lost a number lately and wanted to know what the trouble might be. After examining the birds, I gave a diagnosis of "limber neck" due to *Splintaria* poisoning. Two of the birds were nearly dead. The third was stronger. So this one I gave castor oil with the result that by evening it had improved.

After dinner I went up the river and out the Kendall Canal as nearly as I could estimate there were about 7000 ducks banked up here. Two thirds of these were Pintails. Next in abundance were Green-winged Teal. Mallards were common and



there were scattered Cinnamon Teal,  
Spoonbills and a few Gadwall.  
No sick birds were seen.

Nelson brought me four water  
melons. In the evening I  
gave a "party". Jim Hull, jr. came  
with a north coyote so that we  
had sufficient.

August 25, Friday.

Cool and pleasant today.  
I worked at the laboratory all  
day on notes and  
correspondence.

Wheat is now \$1.28 a bushel  
and barley 1.40 per hundred.  
I am feeding 12 quarts twice  
a day to the birds now so  
that it takes considerable time  
in going. Ran short tonight  
and had to get a sack of  
wheat from Sackett. This grain  
really belongs to Cook so that  
I will repay it for. Davis will  
send you four sacks of grain  
Monday.

Booley went down to Sackett  
with the bunch in the evening  
after grain.

August 26, Saturday.

This morning but not  
late in during the day. Very  
little breeze blowing all day. There  
is a distinct wave of migration  
today. Yellow & Pileolated Warbler  
commenced in the willows, a  
Water Thrush along the river  
and a Rock Wren near the laboratory.  
In the afternoon an adult male  
Macgillivray's Warbler was seen.

*Chaulea integrata*, *Helminthos*  
*rustalis* are in full bloom. *Schizog*  
is just coming in.

3 1/2 after breakfast I went out  
in the launch. The full  
quota of ducks is present here  
there and the marsh now.  
The whole of South Bay from  
Baird's overflow west and as far  
down as I could see was  
covered with ducks. These  
were mainly Pintail and Green-  
winged Teal with many Mallards  
(and a few Spoonbills).

The river has raised half  
an inch here but the water  
in the bay has dropped so  
that there is much of the  
banks of the overflows exposed.  
This drop is due probably to  
the clearing out of the Sphagnum  
in the bay. This cross serves  
to bank the water up into the

hold it back. The lake too is  
low causing the flats to drain.  
There were very few shore  
birds here. No Godwits were seen  
at all.

Two sick green-winged Teal were  
caught but no more sick birds  
were seen here. Returning I  
cut through in the cross channel  
to #3 and went down to  
Bry's overflow. At the mouth of  
this overflow large areas of mud  
have been newly laid bare.

Here we caught 7 green-winged  
Teal, 1 Spoonbill and one Pintail.  
Gulls mainly California with  
a few Ring-bills were very active  
here. I saw them pursuing  
sick birds that were only slightly  
affected. The gulls alighted near  
the Teal and attempted to seize  
them. The Teal escaped by diving.  
One Pintail that was helpless  
had been eaten in the camp.

The mud was very soft  
and deep through here and walking  
correspondingly difficult. Two  
sick birds escaped because of this.  
I noticed that some of the  
willows (*Salix amygdaloides*) growing  
farthest down were dying.  
On the afternoon I worked on  
Notes and specimens at the

Laboratory. Mosquitoes have  
decreased again. I was  
able to sit outside in the  
shade without being troubled by  
them. It was cool and  
pleasant.

The chicken brought down  
Thursday by Brigham Nelson  
now seems entirely well and  
spends its time hunting for  
food. It has no fear of us  
whatever.

The windows and frames  
in the laboratory have never  
been painted, and Bosley is  
going over them now. The  
putty around the glass has  
come loose and in some cases  
and needs replacing. This will  
put the place in good condition  
for the winter.  
Cook went in to Corning  
this afternoon and sent in  
for five gallons of gasoline.

I find that in putting weak birds that have been kept on dry land ~~and~~ into the stock pens that it is best to put them into the water in the morning. This gives them the entire day to become accustomed to the pen. The birds drink a great deal at first which tends to lower their temperature. When they lie helpless their feathers dry out and do not receive their usual preening. One in the water the birds often become very wet and bedraggled especially if they die a great deal. This renders them liable to chill and if the nights are cold they are more liable to succumb if placed in the water in the evening. It is bad too to put them in on cold rainy days.

I believe that the bottom of the stock pens should be covered with inch mesh wire in all cases. At present I have two inch mesh on the bottom of two pens and find that the birds dig them out ~~badly~~. They are unable to work to any great extent through inch mesh.

It will be better too I think  
to separate seal and Spoonbills from  
the large ducks when they  
are brought in weak as well  
as <sup>well</sup> later on when they are strong.  
The Pintails feed Mallards fast  
heavily about riding over the  
smaller birds in a bad way.

Feeding in troughs has proven  
a great success. For Redheads  
the trough is made ten inches  
wide for other ducks four inches  
wide. The troughs are one and  
 $\frac{1}{4}$  inches deep and five feet long.  
These troughs are placed in  
the pens cross wise at the  
waters edge so that the  
ducks have ready access to  
food and water at the same  
time. A separate receptacle  
 $10 \times 14$  inches and  $1\frac{1}{4}$  inches  
deep holds grit. One of these  
is in each pen.

I have been feeding bran  
mash containing small <sup>other</sup> every  
evening but now will reduce this  
to twice a week as <sup>this</sup> <sup>other</sup>  
seems too frequent. The ducks  
seem to prefer barley and wheat  
mixed to straight wheat. The  
Redheads, of course clean up  
everything without discrimination.

In the laboratory I keep weak  
birds in wooden trays 20x24  
inches inside, and 3 1/2 inches deep.  
The bottoms is of tongue and groove  
flooring. These trays are painted  
to facilitate cleaning and are  
a great convenience. I place  
heavy paper in the bottom and  
put the birds in. The paper is  
renewed each morning. I  
keep birds here that are too  
weak to hold up their heads.  
As they grow stronger I place a  
pan of water in front of them  
and when their eyes open  
they usually drink freely from  
this. If the birds are fat  
and heavy they get along without  
food for two days. Then I feed  
them small things 1 to 2 inches long  
morning and evening. Birds that  
are thin in body are fed  
all along. Grain may be fed but  
it is a long process.  
In feeding I seize the head  
in my left hand open the  
bill and hold it open with  
thumb & fingers. The fish are  
pushed on back of the tongue  
by means of a pair of tweezers.  
I give from 6 to 12 at a time.  
With all sick birds that  
are at all weak. I find that  
castor oil is an effective means



of cleaning them out. The dose  
Administered by means of a  
medicine dropper. Seal receives  
half a teaspoonful, large Chucks a  
teaspoonful. This passes out  
in twenty to thirty minutes.  
and seems to serve in cleaning  
out the intestine as well as  
soothing any irritation present.

In some cases the excrement  
is almost entirely renal. This  
seems especially true when birds  
are exceedingly fat and get no  
food save water. The renal  
matter is tinged pale green and  
comes out in balls that dry  
and harden almost at once. This  
renal matter is very irritating  
to the protruded anus and keeps  
it reddened. One green-winged  
teal male had its penis caught  
in one of these extruded balls of  
renal matter to that it pulled entirely  
out of the cloaca. I freed the  
organ and found it much  
irritated.

When the birds begin to drink  
themselves the water passes through  
them rapidly and their  
recovery is very rapid. The water  
in quantities seems very good for them.

August 27, Sunday.

Clear and cool this morning  
very little breeze, quite hot during  
middle of day.

Yesterday there were many small  
birds in the willows but today  
there was practically no  
movement of migration.

After breakfast I we banded  
and released about 32 ducks.  
Nearly on half of these were  
sick ducks I brought in August 19.

For these a well was needed  
for their recovery. Others take ten  
days. After it happens that  
a bird thrown seems weak  
and unable to fly but these  
all recuperate their strength in  
a day or two. While I kept  
in the pen they fail to get  
stronger. After birds that are  
strong and vigorous when  
thrown up merely set their  
wings and scale down into  
the river. Few that are just  
out seem at all alarmed.  
If other birds are on the  
river they decoy to them at  
once.

August 28 Monday

This morning Cook took me in to Corinne in his car and I left at ten on the alkali wagon for Kelton. The day was rather hot and all windows were open. At Blue Creek a number of mosquitoes came aboard much to the discomfort of some of the passengers. As for myself I am case hardened so that they did not bother me. Crossing the Promontory Range I had a fine view of the marsh and Delta of Bear River. Passing Little Mountain I had a view of two caves that I have often wished to visit. One was under a white rock near on the eastern end and the other near Cedar Butte.

Ysaashoppers swarmed in many of the dry fields along the tract furnishing any abundant food supply but I saw no birds among them.

A warm spring near the south side of Little Mountain has been fitted up with a rough bath house.

West of ~~near~~ Little Mountain was a series of steep sided washes eroded by water action. Some contained dirty brownish stained water. Others were dry with the bottom glittering with a heavy

alkaline encrustation or efflorescence.  
South of the tracks was a level  
alkaline plain studded with  
round ~~or~~ oval <sup>or irregular</sup> islands grown  
with greasewoods.

May Blue Cuts two large  
Box elder trees grow near the water  
tank. These must be quite old.

At hampden below the grade  
across the Promontory Range were a  
few more box elders.

As the train climbed over  
the pass sage brush replaced the  
greasewoods and great areas  
were yellow with Helianthus  
blossoms. Little Promontory seen  
from here shows as an  
isolated hill separated from the  
Promontory Range by a deep valley.

Promontory lay in a small  
depression in the hills. ~~It~~ ~~at~~  
was made up of a store owned  
by F. C. Houghlen and one  
other house.

Arrived at Ketter at ten for  
a wonder.

Very hot here this afternoon.  
Spent the entire afternoon with  
my note book as I was  
behind.

Arranged for a team to go to  
Locomotive Springs tomorrow with  
some trouble.

August 29, Tuesday.

Left Kelso for Locomotive Springs this morning at seven. The morning was cool and though cold in the day it became very warm.

The road followed east along the railroad track for 6 or 7 miles through a flat ground with greasewood. Two years ago in October when I traversed this same country Jack rabbits were everywhere. Today I did not see one. Some sickness is reported to have cleaned them out last winter.

There were a few shrikes along an occasional *Eutamias* and a few Sage sparrows. I shot three *Eutamias* in the afternoon. They were shy but responded to a squeak.

Crossing the track the road led quartering across the flats toward Locomotive Springs.

There are six of the springs that are first and last distributed through five or six miles. From west to east these are known as the West, Baker, Bar M, Middle, Cliff and Sparks sloughs. These all rise from 4 to 5 miles from the present shoreline of the lake and flow down through channels to join in a marshy area near the lake.

The surface of the springs is

probably 6 to 7 feet above lake level.  
The springs lie on a low bench.  
They rise directly from the flats  
with nothing to indicate their  
presence until one is upon  
them. The Baker & Bar M sloughs  
were each from 50 to 75 feet across.  
The west slough about 30. I did  
not see the others. These springs  
must be formed by ground water  
running down through the porous  
soil until it encounters the  
impermeable clay of the lake  
beds.

I drove down between the  
Baker and the Bar M sloughs  
until dark and began work at  
once. Mosquitoes were extremely bad  
here with the attacks of green  
Tabanid drove the horses frantic.

I crossed over to the Bar M  
slough first. The channel of  
this slough ran from two to  
four feet deep while it varied  
from six to 12 feet in width.  
The channels are treacherous and  
many cattle are drowned in them.  
It is a common saying among  
the cowboys here that enough  
cattle have been drowned in the  
springs to build a fence of  
gold around all the channels.  
Bordering the alkaline barrens  
that were destitute of vegetation

were abundant growths of Salicornia  
utahensis a large woody species  
readily distinguished from the  
smaller S. rubra. Great areas were  
covered with salt grass Distichlis  
spicata and it was in these  
that the mosquitoes were so bad.  
Growth of Salicornia rubra were  
common and I saw much  
Ischa sparsifolia. Donelia erecta was  
also common.

Inlets bordered the channels  
and lower down formed great  
marsh areas. The great mass of  
these I found somewhat to my  
surprise to be the Scirpus olneyi.

In some of the more saline areas  
were small clumps of S. americanus  
~~Chenopodium album~~ <sup>at the top of the</sup> was common  
as was a plantain (spec. Triglochin maritima).

The channel was grown entirely  
with Potamogeton pectinatus forming  
great masses. A green algae was  
abundant also. In shallow ponds  
I found an abundance of Chara.  
Helianthus nuttallii and Lactuca  
pulchella formed scattered growths.

Salt grass, Scirpus and  
Potamogeton are the dominant types  
in their respective associations.

As the marsh approached the  
lake shore & salinity concentrated in  
the soil vegetation thinned & became  
stunted and finally disappeared.

The actual shoreline seemed  
built up slightly for a long  
distance. Great areas were covered  
with piles of timbers and other  
refuse from the cut-off. ~~But~~  
I sitting here in the open  
free from mosquitoes for a few  
moments I had leisure to  
look back at the mountains

The Hog-up mountains on the  
west showed up dry and arid  
barren save for a few scattered  
cedars. They were of moderate  
elevation apparently about 7200 feet.  
Trails visible pointed out the  
location of the springs of which I  
have heard.

On the Batt River Range to the  
north & northwest of Kettle Lake little  
snow was visible. Apparently the  
peaks in this group go up to  
10,000 feet. The actual summits  
were hidden in clouds. Cedars  
and pines were visible.

Black Pine mountain stood  
out alone rising about 9800 feet.  
It was barren with very few  
pines & cedars. Curlew usually  
flies on the south east side.

To the East was an isolated  
rock on the Greasewood flat  
known as monument.

To the south in the lake  
lay Fremont, Antelope, Hat,



Stansbury, Gunnison & Carrington  
Islands, all plants, visible.

The sky became slightly  
overcast with a steady breeze  
from the south. A rain storm  
passed over the lake.

I returned up through the  
marsh to the bog and ate  
lunch. A party of men were  
here for a few weeks engaged  
in putting up hay for winter  
feed. They were cutting very  
grass and long grass mainly.  
After lunch I worked  
up along the ~~Bar M.~~ <sup>Bar M.</sup> slough for  
some distance.

The growth was the  
same as along the Bar M.  
I noted in addition a  
few *Syntherisma* *cutifolia*, *Poa* grass  
(spec.) and there were some *Scirpus*  
*Scirpus*. Also *Phragmites* *phragmites*  
Curps have been introduced  
into this slough and have  
destroyed all the aquatic  
vegetation. In contrast between  
the barren open channels  
here and the Bar M. slough  
where water plants were in  
abundance.

Strangely enough there are  
no frogs in this marsh at  
all. I saw one *Eutamias* and

rattlers are said to occur.  
The marsh is absolutely isolated  
separated by long distances from  
other marsh areas. with the  
lake ten feet higher the springs  
would be covered so that  
the marsh has been formed by  
subsidence of the lake. This would  
account for the absence of frogs  
as these batrachians would be  
unable to cross the barrier areas  
between locomotion and other  
marshes.

I saw about 150 Mallards  
and 15 or 20 Cinnamon Teal but  
no other ducks. One of the Cinnamon  
Teal was a J. piper. Bill Josephson  
a ranch owner here tells me  
that great numbers of ducks  
bred here.

No sick ducks have ever  
been known here. I attribute this  
to the fairly fresh water in  
the channels and the lack of  
stagnation.

I left the springs about  
four after taking several pictures.  
and reached Hutter at six.

Robert springs take their  
name from the clouds of steam  
that hang over them during cold  
weather.

At the Bar M along a  
dam has been thrown across

The spring and water is pumped out for irrigating experiments in raising but have been tried and have proved successful. But raising may be interest into on a large scale which will ruin the locality for the ducks.

August 30, Wednesday.

Clear and warm this morning.

I worked out north of Ketter across a grasswood flat collecting the characteristic plants. Saw one Jack rabbit and several Eutamias. Brewer's Sparrows were common.

left Ketter about 2:20 P.M. and reached Corinn at 6:00

Cook met me and after supper we left for Duckville with an assorted load of groceries, water cans and supplies.

We reached the river at Knudsen's without incident and went on down to Duckville in the small launch.

August 31, Thursday.

This morning early I was at the laboratory. The day I left for Ketter the river dropped suddenly and in the 29<sup>th</sup> Posby found a large number of sick birds in the area extending from

The Mouth of Ben's Overflow to Davis  
Island. We estimated the dead  
birds seen there as follows

Green-winged Teal	200
Pintail	30
Mallard	50
Wigeon	1
Spoonbill	5
Cinnamon Teal	20
Redhead	25
Lesser yellowlegs	1
Coot	5
Tit	1

82 He brought in about  
birds all of which were  
very weak and more than  
half of them died on his hands.  
A Cinnamon remaining in the  
pens were very weak. Seven  
were dead this morning.

We went down No. 3  
this morning and out Ben's  
Overflow. There were a few  
sick birds here but not many. The  
bay was very low and great  
areas of mud were laid bare.  
We went down through Ben's  
Overflow. 7 in sick birds were  
captured. We returned at  
noon and spent the afternoon  
at the laboratory in catching  
up with routine work and in  
starting some new experiments

Aug. 31, 1916.

Original allotment	1000.00
and available Aug. 1	761.82
Total expenditure for August	234.89
unexpended balance	526.93
Estimate for Sept.	<u>240.00</u>

Items August expenses:

Trans. requests	6.40
Bosley Salary	50.00
Schramm-Johnson Farm	2.75
August Expense vouchers	<u>175.74</u>
	234.89

September 1, Friday.

With this morning we went out 3 1/2 in the launch. The launch was left near the channel to the west and we went in down the flow in the rowboat. I walked along the shore and Bosley took the boat on down. At the lower end of 3 1/2 we crossed to the east shore and walked down as far as Davis Island. From Mud Point to Davis Island was a great area of bare mud and many dead ducks were scattered over it. A few still alive were among them - Most of the living birds were Mallards and Pintails and I consider them as sick from the outbreak of August 29. We secured the following.

Mallard	3
Pintail	10
Common Teal	4
Greenwing	1
Spoonbill	1

This afternoon we banded and released about 15 birds and I continued to work on notes.

Did some work on my August expense account but did not get it

September 2, Saturday.

This morning early I cleaned things up around the laboratory. About nine with Cook went up to ~~Conrad's~~ in the launch and then in to Corinn in the car.

Met Dr. G. K. Fisher and S. E. Pipers at the train at 9:40 and after purchasing a few supplies left at once for Duckville. Pipers and I rode for the trailer behind the car. We reached Duckville about noon and after lunch went over to the laboratory. The afternoon and evening were spent in talking over the work.

We banded and released about 30 ducks during the afternoon. I find that it is not advisable to turn out more at a time as the birds beat themselves on the wires when the cage is entered and weak individuals become exhausted.

During the evening I completed my expense account with various vouchers for the month of August for the

September 3, Sunday.

This morning the ducks and various details about the laboratory were attended to at first. About 9 we left in the mudboat for a trip around Land's End. We went down the river crossed through the Neley Canal Canal into the old River Channel and then into North Bay. I steered the boat while Joe Cook was engineer. There was some wind early in the morning which made it disagreeable but later it was calm.

Around Land's End I found large areas that have been dry during the summer. These although cracked are now covered with water. I saw where four or five coyotes had crossed from Hansine's Island to the North shore.

The water around Land's End had a rotten evil smell, the color that comes up across the flats with a south wind after a hot day with no wind.

We ran far out to the boat in rounding Land's End in order to escape the stink of dead Scurfs standing in the water.



Returning along the South shore  
we came up as far as Slaughter  
Island. There were several  
sick sandpipers (Western) here.

From Slaughter Island we  
went south to Klondike.

The water was Saline here  
and simply swarmed with  
brine shrimp. These lay in great  
masses taking advantage of  
every depression to keep from  
being swept away in the current.

I brought in a jar full.

Very few sick or weak  
ducks were seen on this  
trip which used the entire  
day. We brought in 10 live  
birds. No sick birds were seen  
at all on the west shore of  
Hansens Island.

Dr. Fisher collected a godwit

September 4, Monday.

This morning we went down  
Brown's Overflow in the launch  
taking the rowboat with us.  
It was a fine clear day  
cool and pleasant. The  
whole north bay was  
covered with birds of all  
sorts. Dr. Fisher collected more  
Godwits and a Horned Grebe  
The first one that I have  
seen here. We captured  
8 or ten sick birds.

During the afternoon we  
banded and released about  
fifty ducks. I cleaned out  
twenty-five Redheads. Grain  
is very high now \$1 30  
or more a bushel for wheat  
and these ducks eat  
enormously so that I cleaned  
out all that I could to  
cut down on expenses.

Sept 5, Tuesday.

This morning we left at six in the launch for Corima and reached there about nine after the usual trip up the river. Bosby quit today as he wants to go to Price Utah and enter school.

I bought various supplies in Corima, deposited my expense account and attached to other business.

Left Corima about two and started down the river. I stopped for a few minutes at Myers Grove and collected one hickory sparrow. I had expected to find many birds in here but saw practically nothing.

Reached the laboratory about five and had a busy time getting things in shape again.

September 6, Wednesday.

Astriss Eckert began work for me today. In the forenoon he arranged some experiment pens for me and filled in around the duck pens. In the afternoon he went out being unwell and got 13 ducks. I worked at the laboratory all day.

Sept 6, Wednesday.

Cool and clear this morning. Temp. 52°. The river has come up a little again.

Clear and warm but not too hot all day long. The mountains are now dim with haze.

Sunflowers and Goldenrod are in full bloom.

Was up at six thirty and went over and fed and cared for the birds at the laboratory. I found this a small matter needing only half an hour or so.

There were six or eight Redheads in the racks and one Mallard but I found that all were banded birds. There were about twenty birds in the river nearly all being Redheads.

Fredrick Sackett began work at the laboratory this morning. During the forenoon I had him fill in the Seal and Mallard pens where the birds had been digging. He also put clean salt grass in the Redhead pen. I find that it is well to cover the wire and dirt in the pens with salt grass. ~~to it~~ This may be removed and renewed as needed and takes most of the excrement with it. And this way a sour smell is avoided.

in the pens and a more sanitary condition is maintained.

Fifty <sup>young</sup> Redwings require 15 to 17 quarts of mixed grain per day.

The same amount will do at least this time as many adult pintails and Mallards. The latter prefer mixed grain (wheat and barley). Teal will ~~eat~~ <sup>eat</sup> green-winged and Cinnamon Teal will hardly touch barley but pick out the wheat so that now I feed them straight wheat.

Sackett fixed two boxes to be used in shipping Redwings later. In the afternoon he went out No. 3. He reported very few newly hatched birds. The following were brought in

Green wing Teal	10
Gadwall	1
Spoonbill	1
Mallard	1

He captured 7 Redwings also.

I worked all day nearly in getting up to date on notes and Catalogs. Made a number of dissections.

Nansen came in for a time.

Clyde Webb telephoned in this evening that he had two Mallards for me caught on Willis's. I found that they had lead poison.

M. A. Booth of Brigham was down  
today. Cool met him at Kunda's  
with the launch. On the way down  
Booth wanted to shoot a male  
Night Heron changing to third year  
plumage. It was killed with  
a 22 Remington-Union-Case rifle.  
The bird floated down at noon I secured it.  
Booth laughed and said that there  
was no proof that he had shot it.  
I kept the bird and skinned it.

September 7, Thursday.

Temperature this morning 50°.

The day was clear and warm. The air is beginning to get an edge and I find that the water is chapping my hands. I took a bath in the river before breakfast and found it not too cold.

After breakfast with Sackett I went up the river and out Knudsens #1 (Pillus). Clyde Webb joined us. The extreme eastern end of North Bay is almost entirely dry.

We captured 9 Green-winged Teal and one Gimmal as all of them being quite strong. 7 ~~see~~ dead birds were noted. We picked up two Redheads too, immatures. Birds that had gone down in the shallows.

There were not an unusual number of ducks evident today not one fourth of those that I had noted here on Monday from the mouth of Brown's Overflow. In the evening Mr. Mills at the Chesapeake called me by phone and remarked upon the sudden disappearance of a great body of ducks of all species. He had noted this same phenomenon on

two years at approximately the  
same date. Thinking back my  
observations coincide with his.  
Evidently a large body of ducks  
gather in here from Aug. 10 on and  
then move on perhaps to  
California at this time.

This afternoon Sackett and I  
banded 42 ducks. This gives a  
total of 197 banded ducks for this  
season. 70 of these are Redheads.

We caught four Redheads without  
bands in the racks today. Evidently  
they continue to pass up the river.

I worked on dissections all  
the afternoon.

I have three mallard drakes  
in the pens with lead poison now.  
These with some that have died  
have come from Browns & Kundsens  
#1. There were many here last year  
too.

Considerable excitement over rabies  
just now. I carry a club or a  
gun at night.



September 8, Friday.

This morning Sackett went out  
number 1 and brought back  
the three experiment pens that I  
had out there. He captured five  
young Redbills. The rest of the  
day he was busy in picking  
up experiments pens. Toward  
evening we banded and released  
a few ducks.

I worked all day in making  
dissections and in studying sick  
birds.

Um Devening in the laboratory  
has been very wet for two  
days. At intervals I have  
used ammonia gas as a  
tonic and think that it has  
done some good. Toward night  
it became badly choked up  
and I found that the exhalants  
had hardened to cheese like wood.  
I have learned that Epsom  
salts with lead forms an  
insoluble compound. So have  
put the remaining shot poisoned  
Mallard in a pen ~~with~~  
have given it for drinking  
water a solution of 50 grammes  
Magnesium sulphate in ten quarts  
of water. In a short time  
the water was stirred from  
from the fecal matter. ~~the~~  
The one remaining bird is very

walk. The others that I had  
died today.

The Redheads outside are  
digging under the redhead pen  
and have it badly undermined.  
Worked until 11 P.M.

Sept 9, Saturday.

Thermometer at 6:00 A.M. 50° a strong North wind blew all day and I thought for a time in the afternoon that it would snow. The air was keen and piercing.

I wrote and worked on experiments nearly all day. Got rid of accumulated official correspondence.

Sackett felled in the duck pens this morning a big job. In the afternoon he went out 3 1/2 and brought in eleven sick birds. Four of these were lead-poison birds (3 mallards & 1 Pintail).

The bird gym epsom salts seem stronger to day. This afternoon it was able to work out of four of water and go to back of cage. Yesterday it could not move at all. This thin brown that I doubt if it pulls through. I put four other birds in with and moved the obstruction. This time I used 60 grammes of Magnesium Sulfate to 10 quarts of water.

All day there has been much migration among the small birds. Morning all evening I went up, along the willows and collected a few.

Temperature at 6:00 P.M. 40° F

Sept. 10, Sunday.

Temperature  $38^{\circ}$  this morning  
a strong north wind all day.  
I worked at the laboratory all  
day but was more or less  
interrupted by visitors as there  
was a crowd at the gun club.  
There was some talk of prohibiting  
sink boxes this year. The Bear River  
(and Duckwith gun clubs are willing  
to do so but Booth apparently  
is not.

I found 74 shot in a Mallard  
stomach today which is high  
mark. The greatest number noticed  
before was 72. These lead poison birds  
seem to occur more when the  
water is low. The birds that I  
have on the Epsom salts solution  
continue to do well. Their  
excrement is brown in the main.  
Only occasionally is it tinged with  
green. The lead color of  
the caeca is a characteristic  
sign in post mortem. And mortem  
of birds may be told from other  
suck ducks with duck disease by  
the fact that the membrana  
nictitans remains functional.

Sackett went out Browning  
this morning and did not  
return until four. I thought  
that perhaps he had broken  
down so I borrowed Cook's lunch

and went up to look for him.  
He brought in about 80  
sick birds and reported that  
he got all but the more active  
ones.

I cleaned a considerable  
number of Duck skulls tonight  
and after supper worked on  
dissections ~~skins~~ & notes  
until 9:30

Heavy frost this morning.

September 11, Monday

It was extremely cold last night and this morning at 6:30 I found that ice had formed in some of the pans in the duck pens.

There was a slight breeze during the day but on the whole it was fairly warm and pleasant.

After breakfast Sackett and I went out Brown's. We had time to work only the left fork at the mouth but secured about 40 birds. The greater number of them were green-winged teal.

Sunday the strong north wind had driven water in on the flats in the bays at either side of mouth of the conflow. These areas have been dry for some time and when I was here last I noted that the surface was strongly alkaline. It must have been in here that the birds sickened. The water had now receded leaving a few strongly saline pools. I gathered water in these to experiment with.

Not many birds had died here as Sackett gathered so many yesterday.

Saturday night was bright moonlight and there was a

Great flight of Seal in. These  
Sewal birds dropping in many  
have been more readily affected  
than other larger resident birds.  
In the afternoon we banded  
and released about thirty birds.  
This makes a total of 255 ducks  
banded and turned out this  
season.

In bringing in sick birds  
if they are put in the  
water directly they die  
and immediately become  
soaked through. This is very  
hard on the birds with the  
cold nights now. So today I  
kept out all the Seal in a  
dry pen in the salt grass.  
Some that had been in the  
pens overnight were in a pitiable  
condition as they were cold wet  
and bedraggled. I removed a  
good share of them to a dry pen -

Sept 12, Tuesday

Worked at the laboratory all day. Sackett was not here today as he had to go in to work.

These night was cold but the day warm. Through keeping out of the bird in dry land June I lost very last night. About 9:30 this morning all the strong birds were put in the water. They soaked through wet me but came out on the bank and preened and dried themselves in the warm sun and oiled their feathers well. After this they did not soak up at all. It is strange that their feathers lose their power to repel water so rapidly.

I have a considerable still in the dry pens and that of your water to three times today. Water was administered by means of a medicine dropper holding about 1 c.c. With seal I went around twice so that each bird received 2 c.c. After the bird's head was seized in the left hand the hand enclosing the head and the thumb and fore finger holding the bill open. The medicine dropper (3 1/2 inches long exclusive



of the bulb) was then pushed  
as far down as possible with  
care not to damage the oesophagus  
and the water I pressed out.  
The dropper was withdrawn  
quickly and the bird given  
a second or two to swallow.  
I found that it was better to  
allow a short interval between  
drinks as otherwise the birds  
choke so I handled the  
whole bunch twice. Really it was  
quite a rapid process.

Large ducks received 4 droppers  
full.

The river is rising somewhat.  
Worked on dissections until 9:30  
this evening.

A good many lead poison  
birds are showing up now.  
These are mainly Drake Mallards  
with a few females and an  
occasional Pintail. The larger part  
of them come from Browns &  
Kenderson #1.

Sept 13, Wednesday.

Cool this morning but pleasant during the day.

This morning Sackett and I worked Willis' overflow and this afternoon I covered the mouth of Bassins. All told we secured 45 ducks.

Many of the teal were very active. We found them sitting on shore among patches of marsh & cockleburrs. Many were able to fly.

2 oz of castor oil will treat 27 small and 18 large ducks. As in other works it is sufficient for about 60 small or 30 large ducks.

September 14, Thursday

Warm and clear all day.  
Every one in Duckville went to  
Brigham for "Peach Day" and I  
was all alone. Duckett did not  
work. Had the table piled high  
with ducks so I spent the  
entire forenoon working on  
them and got cleaned up.  
In the afternoon attended to  
the ducks in the pens and  
worked on notes & correspondence.  
Have about 150 ducks in hand  
now all doing well.  
By raising the dry land pens  
have lost very few.

September 15, Friday.

Er Sackett will not be able to help me any longer for which so that I am alone now. Worked at the laboratory all day.

Since Bosley left I have attended to feeding the ducks and carrying for the experiment pens and found it not a hard job.

September 16, Saturday.

This morning Harry Sackett came to work for me. We took the launch and went out 3 1/2 and then crossed to Slaughter Point and worked round to Slaughter Island. About three days ago there were a large number of sick birds here as along this shore about 500 lay dead. We got about 45 sick birds.

September 17, Sunday.

Worked at the laboratory all day. Harry Sackett went out Bolon's but found few sick birds. In the afternoon we banded and released a large number of birds.

Sept 18, Monday

Was at the laboratory all day. Sackett worked filling in around the duck pens and prepared several experiment pens for us.

Sept 19, Tuesday.

Was out Uptill's overflow this morning and secured a few sick birds. Worked at the laboratory in the afternoon.

September 20 Wednesday.

Was at the laboratory all day. Banded and released a large number of birds.

September 21, Thursday.

Worked at the laboratory all day. Sackett busy at various odd jobs.

September 22, Friday.

Cool and pleasant this morning warm with a haze on the mountains all day and a heavy wind and rain at night.

This morning I sent Sackett out with Billas. He secured fifteen sick ducks and reported very few dead. The birds that he secured were strong and vigorous.

This morning while sweeping out I discovered that the five gallon can in which I keep alcoholics was leaking so transferred the contents to pails. On examination I found eight or ten places where the tin was about eaten through. These Joe Cook soldered for me. Before returning the birds to the can I checked them up and saw to it that all were properly labelled.

Made and stained a number of blood smears and fecal preparations and spent some time at the microscope.

In the afternoon I had Sackett cut out a bed that can be hinged to the wall and swung up out of the way when not in use. This I shall put up in the store room so that I may sleep over here when the club opens.

About five a strong wind  
came up from the north then  
it shifted to the south and  
blew with great violence for an hour  
or more. There was no smell of  
the lake accompanying it however.  
Killed a bat in off the flats and  
took shells in part of the laboratory.  
At dusk a flock of 50 snowy  
hens came down the river tow  
over the water in shelter of the  
willows.

After dark it rained heavily.

Sent the following telegram today.

"Biological Survey etc."

State Game Commission wants  
thirty banded ducks for exhibit at  
State Fair. Birds to be released at  
close of exhibition. Am I authorized  
to furnish these. Please wire.

Answer received

"Authorized furnish banded ducks  
Birds to be released at close of exhibit  
No expense to Biological Survey.  
Sigmund Nelson."

## Duck Sickness

Several times I have found <sup>Sick</sup> Green-winged  
Teal in the pens that were soaked  
through and chilled with the  
cold. They rest huddled up with  
the head shaking with cold  
and the eyes shut and set. They  
pay no attention to me and do  
no resent handling.



Sept 23, Saturday.

This morning we went out Brown's Runflow ~~and~~ There had been a ~~strong~~ strong south wind yesterday and I expected many sick ones here on expectation that was verified. There were large areas flushed and we captured more than fifty sick birds. Lockett quit at short notice this noon. I started several experiments this afternoon.

September 24, Sunday.

Worked at the laboratory all day. Had a large number of ducks on hand for dissection. I started several experiments today. Will Belnap & family from the mouth of the Weber River were at the laboratory in the afternoon.

September 25, Monday.

I worked at the laboratory all day today, busied mainly with experiments. I had a number of birds with rumps eaten by gulls and these I banded and released before the other ducks attacked them.

In the afternoon I attended  
to the ducks again and  
caught up on a miscellaneous  
lot of notes.

I have about 258 ducks now  
and am feeding 24 quarts of  
grain per day. I wish to band  
some more but can get no labor  
at present.

I am still using dry land  
pens for walt ducks and find  
them a success. It takes a  
little time to give the birds  
water with a pipette but not  
a great deal. The birds recover  
rapidly too. This morning I  
had three dozen seal in one  
pen. I put six or eight in the  
water leaving those that were  
unable to move about at noon.  
There were six more that were  
able to stand.

The pintails that I got  
yesterday were hard hit and  
I have lost eight out of  
sixteen. I brought the remaining  
birds to the laboratory in the  
evening.

In giving water with a pipette  
to seal of fine that the bulb  
should be squeezed slowly. Although  
the water may run back and  
cause them to choke.

Many birds choke through  
the dropping of the Nucleus  
excretalis from the choanae into  
the ~~mouth~~ <sup>pharynx</sup>. This bird raises  
the head to the length of  
the neck and opens the bill  
with each inspiration. I find  
that with these birds it  
is often impossible to hold them  
head down when the fluid  
runs out rendering breathing  
more easy. Sometimes a  
slight shake aids in this.  
With very weak birds at  
the laboratory it is sufficient  
often to depress the head  
until it hangs over the  
ledge of the bath.

Set Duck Booth came  
along and said that his  
bird family had broken down  
so I went out and towed  
them down to Sackett's.

Cook went to Conroy to-day  
with flatboat. I ordered some  
lumber for shutters for the  
laboratory windows.

Engaged golden Sackett to  
help me tomorrow.

nearly all of them strong and vigorous.

The Hogs were still running at the mouth of Browns but kept out of our way.

But now James Kinudson game warden came down and after dinner we gave him 50 ducks to send down as an exhibit to the State Fair. These birds I banded and turned over with the understanding that all were to be released at the close of the exhibit. I included in the lot a wing tipped Bluebill, a broken winged Pintail and two Redheads that are to go to Liberty Park.

Afterward we picked out five pairs of Redheads to send to Col. J. C. O'Connor, Virginia Beach Virginia for breeding purposes and three ♀ banded and released the others ♀ save three or four that I put in with the Mallards.

September 28, Thursday.

Clear and cold this morning with a sharp north wind. Breakfast was late so I pulled out without any. With Golden Sackett I went up the river and out Kendall #1. The water is raising and there is a very swift current in the overflow and main river.

There were large numbers of Seal in the overflow. They rose with a great roar of wings. We secured very few sick birds here and the country is practically clear of them.

~~Some~~ Pools newly found on the flats were bitter with the salts in solution. I picked up one sick snowy tern.

Returning I went out the Kendall Canal. There were a few sick greenings here in the side ways. Most of them were very weak.

Returning to the laboratory we banded and released a number of ducks in the afternoon. I still have 150 or so on hand.

## Duck Sickness

Sept 28, 1916.

I have two Green-winged Teal now that are very seriously affected. The poison seems to have broken down the control of the motor nerves so that the birds seem almost palsied. Movements are abrupt and uncertain and there is poor control of the head. The birds attempt to drink and preen but with each attempt the head shakes wildly with little or no control. These birds can stand but in walking are prone to rear and fall over backward or to turn around in circles.

At rest the head is drawn in on the neck and is turned so that the side of the head points up.

Any sudden movement or noise starts the palsied trembling.

September 29, Friday.

This morning with Golden Sackett I went out Brown's overflow. The water is very high now. We secured 8 or 9 sick birds. In the afternoon we banded and released a large number of Ducks and started several experiments.

September 30 Saturday.

Golden Sackett worked for me until noon today. We banded and released all the ducks on hand save about 30 Seal that I kept for further experiments. I started several lead experiments this afternoon.

Hunters began to pass going to Booths this afternoon and noise continued to come down until late at night.

In view of the shooting season I worked some on my expense account this afternoon.

Statement October 1, 1916.

Amount available Sept 1	\$526.93
Total expenditures for Sept.	<u>191.10</u>
unexpended balance	335.83

Estimated expenditures for October 180.00

Items in September expenditures	
Bosby Form 3	8.33
Es Sackett .. ..	18.00
Expense voucher	<u>164.17</u>
	190.50



Es Sackett Lime September 1916

6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30  
+ + + + + + 0 + 0

Harry Sackett Lime September 1916  
+ + + + + + 1/2

Golden Sackett Lime September 1916  
+ + 1 1/2

October 1, Sunday.

Rain began this morning and continued all day.

Eight men shooting at the Duckville Gun Club. About 550 ducks were brought in to the Duck house. Nearly all were large ducks. Some of the guides were complaining because the hunters would not kill teal but waited for large birds.

A good many are shooting at Schellts too.

October 2, Monday.

Rain still continued all day today. The flats are covered with water. I have a bad cold and have remained in ~~my~~ <sup>my</sup> ~~the~~ <sup>to</sup> day. Every thing is damp and disagreeable. I have a fire in the stove constantly. The path to the Clubhouse is a sea of mud. Went to Corinne & return in forenoon & get off my monthly payments.

October 3, Tuesday.

Rain continued all day today. This is one of the most severe storms known here for years. Some water bats in around the windows and under the door but the roof is tight and I am very comfortable. Shooting is not so good today. Teal, Pintail and Spoonbills have spread out

to feed on the flooded flats.  
Flocks of 2 or 3 swirled past the  
laboratory and out over the barrens  
all day long.

Birds released about 30  
chicks this afternoon. Employed  
New West to help me.

October 4, Wednesday.

Went in ~~to~~ to Corinne on the  
Dart this morning. Rain continued  
for part of the forenoon and then it  
cleared. The river has risen rapidly.  
Left Corinne at 9:41 changed at  
Brigham and reached Ogden about  
11:00 a.m. Registered at the  
Marion Hotel.

Saw Mr. Bigelow afternoon for  
a few minutes and bought supplies  
and did various errands about  
town.

October 5, Thursday.

Went to ~~to~~ Salt Lake City this  
morning on the Volley line. Clear  
and rather cold this morning.

Saw Mr. Chambers, State game  
commissioner and talked with  
him concerning Duck & illness,  
abolition of sink boxes & non sale of  
game.

I had lunch at Fisher & Rogers  
cafe & talked with both those gentlemen.

After noon visited the State  
Fair grounds and saw the ducks  
that I had sent down to Chambers  
for exhibition. They were in an  
enclosure 6 x 15 feet with an  
abundance of water. I was  
interested in noticing that they  
paid no attention whatever to the  
crowds without but swam, preened

or slept apparently without a thought of fear. I believe that a juv. had been in transit. I missed the Bluebill that I had sent down. Chambers however said that all were in good condition.

I spent the evening with Mr. & Mrs. G. L. Jreganza at 614 East 6th South Street and had a very pleasant time. Mr. Jreganza has a magnificent collection of birds eggs from all over the world. There are probably 30000 specimens & about 750 species & subspecies of North American Birds were represented. An addition were a great many foreign species which were of great interest to me.

Left Salt Lake City at midnight reached Ogden at 1:15 a.m.

October 6 Friday.

Was up at 6:15 this morning packed up, had breakfast and left for Corinne at 8:30. Quite cold this morning but clear. Reached Corinne at 9:40 and left at once in the launch for Duckville. A light shower fell. The river is very high. In fact it is now about at spring water level. I saw quite a number of ducks along the river.

Near the Chesapeake were several  
cripples. Several dead ducks  
among them a Ruddy and a  
Redhead were seen floating in  
the water.

Found everything at the  
laboratory in good condition. Joe  
Cook has cared for the few ducks  
still on hand during my absence.  
Spent the afternoon in straightening  
up and clearing up the  
numerous details that I have  
accumulated during my absence.

October 7, Saturday.

Worked at the laboratory all  
day today. Clear and sharp.  
Since October 1 I have slept  
in the back room at the laboratory.  
Have made a folding bed that  
raises against the wall so  
that it takes up very little room.  
I have a feather bed in it and  
it is very comfortable.  
Saw Mr. J. C. Hurley of the Bear  
River Club this evening.

October 8, Sunday.

Clear and very cold last night  
see a quarter of an inch that  
froze in a pool standing on a  
piece of canvas. Clear today.  
The flats are still flooded in.

October 12, Thursday.

Worked at Laboratory all day today, staining & mounting sections. Have made a small carrying case for 22 mm cover glasses so that I can carry a supply in the field and secure blood smears from crippled birds.

October 13, Friday.

Clear and fairly warm all day today.  
With E. Sackett went out Channel 1  
and crossed to Bayliss Island for

the purpose of ~~lifting~~ sifting for snail shells.  
Bayliss Island is a small <sup>circular</sup> island  
(*Siripus palmis* growth)

about 30 feet in diameter. It is  
said to have been the site of a  
blind each shooting season for  
twenty years or more. Thousands  
of shells have been found from it.

From its location the flight of  
ducks must have come in from the  
southwest west and northwest.

We chose a line a little north of  
west and began work. The  
first sifting was done at 30 yards  
from the island shore. Subsequent  
stations were chosen at 20 yard  
intervals up to 210 yards. Three

seives were sifted at each station.  
Each seiv held approximately  
10 quarts of mud. Each seiv full  
was in most cases taken up  
at one or two shovels full and  
~~two~~ two thirds of each one came from  
the upper six inches and 1/3 from  
the next lower six inches. The sand  
was fairly firm so that in walking  
I sank in five inches. At 170  
yards a sand bar was  
found.



Following distances were the results.

number	distances	no of shot
1	30 yards	0
2	"	0
3	<del>30</del>	0
4	50 yards	0 (taken 1-4 inches deep)
5	"	0 .. 4-8 .. "
6	"	0 .. 8-12 .. "
7	70 yards	0
8	"	0
9	"	1
10	90 yards	0
11	"	3
12	"	1
13	110 yards	0
14	"	1
15	"	5
16	130 yards	3
17	"	1
18	"	3
19	"	0 (taken 1-4 in. deep)
20	"	12 .. 4-8 .. "
21	"	3 .. 8-12 .. "
22	150 yards	4 .. 4-8 .. "
23	"	0 .. " .. "
24	"	2 .. 1-4 .. "
25	170 yards	2
26	"	1
27	"	2
28	190 yards	0
29	"	1
30	"	1
31	210 yards	0
32	"	0
33	"	1

The shot were found at 70 to 210 yards from the blind and seemed more abundant at 130 yards.

After finding no shot in the first 8 screens as a test I placed 10 number six shot in screen # 9. All ten were recovered without trouble. Though many seeds of *Potamogeton* etc and other vegetable matter accumulated in the bottom of each screen there was no difficulty in picking out the shot as they were seen at once.

The shot recovered were all somewhat corroded and with few exceptions were much battered, scarred, flattened or even square. The bulk of them seemed to lie at from from 4 to 8 inches from the surface.

At screening I used a frame of two by four material one end of which rested on the boat while the other was supported by two legs. The sieve was placed on this and filled with mud. I poured water in with a bucket while Backett worked the mass with one hand.

About two or two thirty we finished and then crossed to the fourth island in East Pass and shot until five. I killed one Mallard, 1 gadwall, 2 wigons, 6 Spermills

October 15 Sunday.

This morning there was an exceedingly heavy dew. A. O. Ireganga and A. W. Boyle of Salt Lake City were down today - they came to Kunder's in Ireganga's motor cycle and I met them with the launch. We went to the laboratory until noon and banded and released eight or ten ducks. One female pintail flew up the river and was killed at the Bear River Club within an hour.

After a camp fire dinner at the laboratory we went out No. 2 in the launch and the back and out Brown's overflow. No sick ducks were seen at all. A few cripples noted. I saw as gos hawk but missed it. Shot a female Rufflehead.

They left about four.

Had trouble with the engine returning. Account dirty gasline. Cleaned out the line & tank & borrowed gasoline of Hillhouse who passed with Booth's launch.

Learned from Dr. A. C. Beble that a banded duck had been killed recently at Mud Lake delta. Alas that Atropine would serve to relax the pyloric sphincter in birds.

October 16 Monday.

Clear and quite cold this morning. Leaves on the willows are turning rapidly and many as they yellow come down.

This morning this Sackett of went out  $3\frac{1}{2}$  and down the inside channel to Bigelow's Point. Here was continued the work of sifting for shot. At Bigelow's Point a blind has been located on one small island for 20 years or more. In addition a second blind two hundred yards south has been used for the same length of time. The flight here is from the south and east. We worked out southeast from the Bigelow Point blind, ~~and~~ the first station was at 20 yards and then we stopped at each succeeding 20 yards up to 230 yards. This line carried us out in vicinity covered by shooting from both the blinds mentioned above. In addition boat blinds have been built all over the bay here. ~~and~~ the shot did not show the distribution noted at Bareless Island but this I attribute to the boat blinds. We were still securing an abundance of shot up to 230 yards where we stopped.

The mud here was soft and

up the bay than there are  
other hunted. I found that  
shooting from the sink box  
made man the birds  
scary and wild. After seal  
would swing up from below  
where they seemed to have  
been shot at, would circle in  
toward the decoys and then  
dart out again. Other birds that  
came in from the east came in  
the decoys readily. No large  
hucks would come near me at  
all.

October 17. Tuesday

Last night I received word of sick birds in the Boca lake region Oregon about 30 miles south of Lake Malheur. Wrote the office to learn if it was advisable to go there. I spent the forenoon at the laboratory in clearing up a lot of work that had to be completed before I could leave. Received a visit at noon asking if exigencies etc. demanded the trip and stating that a good habit authorization would be necessary. As there was no time to await a new authorization I replied that it would be better to abandon the trip.

Warm today with rain threatening. I marked two large boxes of alcoholics & took them over to the wharf so that they will leave tomorrow on the launch.

Examined the intestines of the ducks shot yesterday critically. I found that two the greenings showed considerable irritation. The others were clear. Some of the healthy ones were quite firm & hard so that it is rather that character of little value.

October 18, Wednesday.

Before daylight this morning came a light fall of rain. By eight the clouds began to clear and by nine the sun was out. The wind hung in the north all day and by four in the afternoon it was extremely cold.

At the laboratory I worked during the forenoon on experiments and also paraffined a large number of small vials containing alcohols. In the afternoon I went up to the Grand River Club and purchased half a bushel of wheat from Vince Davis at the rate of \$1.50 per. Hunter's report quantities of Mallards in the East Pass country.

It is said that there are quantities of Bluebills, Redheads & Canvasbacks on the Chesapeake but no shallow water ducks.

I was strongly tempted to go out shooting today but finally thought better of it and stayed in. Frank Larson told of an enormous Mallard flight in the East Pass country.

October 19, ~~Wednesday~~ Thursday  
 Last night was extremely cold  
 and this morning there was a  
 strong north wind. Ice froze three  
 eighths of an inch thick in standing  
 water. I was interesting in  
 noting that in small pens  
 in which Redheads were imprisoned  
 that the water in the pens while  
 a mass of slush had been kept  
 open by the ducks. While in others  
 containing Mallards & Pintails the  
 pens were frozen solid. This  
 illustrates difference of habit in the  
 birds very well.

This morning I went out  
 in the marsh with Will Neal  
 from the Bear River Club. We went  
 down Channel 2 and crossed to  
 Number 1 Island at the head of east  
 Pass.

There was quite a flight of  
 birds and we killed 41

viz		
Mallard	2 (♀)	2
Pintails	(♀)	10
"	(♂)	4
Gadwall	♂	2
Widgeon	♂	2
Green-winged Teal		8
Spoonbills		13

The predominance of females  
 over male pintails was  
 remarkable.



Hunters say that there are more  
ducks this season than any  
year for five years past.

The day was pleasant as  
the wind moderated and the  
sun shone warmly. Shooting was  
good and we had an enjoyable time  
of it.

With a level shoreline covered  
with alkaline effluence raising  
from 1 to 4 inches above water level  
of a lake or pool the following condition  
might occur: Suppose that a  
blast of wind blowing 20 to 30 miles  
per hour carried water out  
across the flats. It would advance  
slowly a foot to a minute perhaps  
or even a yard to a minute. Progress  
would be by a series of little  
waves that lapped over the  
effluence covering it and take it  
into solution. Might it not well  
be that the  $MgCl_2$  present  
would be absorbed more rapidly  
or in greater amount than  
other salts thus surcharging the  
advancing water line with this  
poisonous chemical. Birds following  
to feed eagerly here would  
inevitably be poisoned.

October 20, ~~Thursday~~ Friday. Friday  
Very cold last night again  
Clear today. Worked at the laboratory  
all day. The glass slides that  
I can buy in Salt Lake City are  
no good. Sections refuse to  
stick to most of them.

~~October 21 Friday Saturday~~  
~~Also busy at the laboratory~~  
All day again today. There is  
a heavy frost every night now  
but still the leaves hang  
in the willows.  
About six with Es  
Sackett I went out 3 1/2 with  
the launch and then crossed  
in the rowboat to Slaughter's  
Island. We reached the  
island at dark. The air was  
sharp and cool. We cut  
a quantity of tule and  
piled them on a slight  
elevation at the south end  
and put our bed on this.  
After a light lunch we  
turned in about eight.  
The night was dark but  
the stars were clear and  
bright. Ducks were quacking  
and feeding all about, flocks  
of about came in to roost  
and numbers of Snow geese  
kept calling from the shore

behind ~~Mattys~~ Island. My  
bed was soft and warm and  
I was soon asleep.

October 21<sup>st</sup> ~~Friday~~ Saturday

Was up this morning at  
4:40. A stamp still was in  
the air and the bed tarp  
was heavily covered with frost.  
Boots and other things left  
out were likewise coated. After  
dressing I chanced to turn  
a pocket flashlight out to the  
east twinkling at four or five  
times. All the ducks and geese  
within half a mile rose with  
a roar of wings.

Went round south and  
west beyond the short lake  
Island until we came to water  
over knee deep. By this time day  
was breaking and we could  
see small flocks of Bluebirds flying  
getting in their line of flight.  
We built a boat blind of  
willows and canvas working as  
fast as cold fingers would  
allow. By ten o'clock we  
had 12 Greater Scaups. The  
flight was slow and not  
many birds were in. About  
ten thirty they refused to decoy  
so we pulled out pulled up  
our bed in Slaughter Island

and set up for a shoot  
in Slaughter Point. There was  
a good flight of teal here and  
I killed ~~one~~ number.

Returning we had some  
trouble as the ~~shot~~ <sup>was</sup> lost  
on the ~~camp~~ but finally made  
it.

I had only a light  
breakfast and no camp today  
so was ~~enormously~~ hungry  
tonight.

October 22, Sunday

Cold and sharp all day  
today. I worked at the laboratory  
all day. Skinned nine bluebills  
among other things. Two I had  
picked and found them excellent  
eating. Had Sackett working today.

October 23, Monday.

I began packing and cleaning  
up in earnest today. Sackett  
worked with me all day. Cold  
at night but warm during the  
day.

October 24, Tuesday.

I finished packing and cleaning  
up today. Put many shutters  
on the windows. All the  
duck pens were stored on the  
flats on the open barrow.

It was quite a job to get  
the four largest pieces out of the  
river as they were well fast  
in the mud.

In addition to packing &  
have been carrying on a final  
series of experiments. liberated the  
last of my ducks today.

Articles stored at laboratory

- 1 box shells # 8 shot 16 gauge
- 2 " " # 6 " "
- 9 pt mason jars flat top.
- 2 pt. " "
- 10 2 qt. " "
- 10 stringer mouse traps
- 12 Out 6' sight " "
- 1 meat grinder
- 1 ax
- 1 saw
- 1 hammer
- 1 dipper
- 1 10 gal. water can
- 1 5 gal gas. can
- 3/4 sack bran
- 3 lin. ft 3' gal. screen
- 9 10 qt galv. pans (worn)
- 7 12 qt galv. pails (1 n.g.)
- 1 gal. canteen.
- 1 gal. alcohol.
- 3 galv. pans (small)
- 1 lb. absoluti alcohol.
- 1 lb Formaldehyde.
- 1 can chloride lime.
- 1 lb Ca Cl<sub>2</sub>
- 2 16 g. flasks
- 6 8 g. " "
- 1 1000 c.c. graduate
- 1 125 " "
- 6 breakers acid sizes
- 1 pestle & mortar
- 1 wire stand & 2 rings
- 1 glass funnel.

- 1 8oz alc. lamp
- 1 bell jar
- 4 small glass funnels
- 15 Louella (1/2 badly worn)
- 1 dipper
- 1 wash basin
- 1 stone (personal)
- 1 water kettle
- 1 chest pan
- 1 broom (n.g.)
- 1 mop
- 1 brush
- 2 qts white paint
- 2 qts gray "
- 12 platforms 4x7ft.
- 3 6x4x12 pens 1" mesh
- 1 6x4x12 " 2" " (n.g.)
- 7 3x3x6 " 1" "
- 2 3x3x5 " 1" "
- 3 3x3x5 " 2" "
- 1 3x3x4 " 2" "



October 25 Wednesday

Left Duckville this morning  
at 7:00 and reached Corinne  
at 9:15. Left Corinne at 9:40  
Arrived Ogden 11:00 a.m.  
Registered at Marine Hotel.  
Cleaned up and after lunch  
called on Mr. Bigelow. ~~Left~~  
Various errands around  
town occupied the afternoon.

October 26, Thursday

Was up this morning at  
seven and after breakfast  
went down along the Weber river  
for a time. The morning was  
sharp and cold. I had a  
saw shot at Duckville  
with me and this I skinned  
and dissected, sitting on a  
log and using an old box  
for a work table. I prepared  
it outside rather than  
work in a dark room at the  
hotel. The sun was warm  
and comfortable today and I  
enjoyed being out. There were  
few birds about and I saw  
little of interest ornithologically.  
I followed out farther than  
I have been before to where  
the river turns in coming out  
of the mountains.  
There is a considerably

head of water in the  
stream now and the  
mouth should be well covered.  
I looked carefully for water cuts  
but saw none.

Noticed that *Chamaea* was  
common. It seemed very good  
to be out among trees and  
in fresh green grass & pine.

October 27, Friday.

A fine clear day. Left at 9:30 for Salt Lake City arriving 10:45.

Called on Mr. L. B. Mc Cormick but found him out of town. Learned too that M. A. Keenan is not in.

Had lunch with A. O. Dreganya and then called on W. H. French president of the Duckville gun Club. He expressed willingness of the club for continuance of the work in Bear River. Met Sam Sherman in town also.

Called on Dr. J. M. Dart.

After this I went up to the capital and saw F. W. Chambers State Fish & Game Commissioner. He asked me if I might write a letter or letter in his behalf to Nephie Morris republican candidate for governor in case of his election. I said that I might do this personally but hardly thought that I could official. Told Mr. Chambers that I would talk with Dr. Fisher concerning it. Chambers is establishing fish & game refuge through the state with the aid of private individuals. He says that the Democratic candidate for governor has threatened to do away with the office of Fish & Game Commissioner entirely. I met Prof. Paul a rank protectionist, who says for the place may get the position.

Having a few minutes to spare  
dropped in to a Shepherd's bookstore  
and bought a copy of the book of  
Mormon and the life of Richard  
Dwight in two volumes (the latter  
for \$2.00)

At five I found Mr. G. L.  
Breganza in his office and went  
home with him on his motor  
cycle. A very pleasant evening  
with ~~Mr. G. L. Breganza~~ then  
Breganzas with Mr. Boyle  
stopping in later. Mr. Breganza  
described a bird with white  
eggs unknown to him. That I  
suspect is an Aimophila.  
I was interested in comparing  
sets of the Stephens + eastern  
Whippoorwill. On Sytochalis  
voeiferus the eggs are dull white  
marbled with lilac. On S. v.  
macromyctes the eggs are dull  
white unmarked and have the  
shape, size & appearance of  
eggs of Phalaenoptilus. The resemblance  
to the last is striking and save  
for the well known rhyacity of  
the collector F. C. Willard might  
cause a query as to the identity  
of the eggs.  
Mr. Breganza has just secured  
a fine series of Ceryle eggs.  
Left Salt Lake at 10:00 hrs.  
Ogden at 11:15.

October 28, Saturday.

This morning I refpacked my outfit secured pullman reservations and purchased a ticket for Washington via U. P. Co. N. W. & B. O.

Saw Mr. A. P. Bagelow. He outlined the plans made for a dike across North Bay to be placed just east of Swiford's point. Also that the Bad River Club claimed the section on which they have pined. And that they will own sections surveyed in South Bay when surveyed.

Left Ogden at 3:10.

Mr. G. W. Becker of Ogden on board. Had dinner with him.

October 29, Sunday.

A fine clear day. Was with Mr. Becker a good deal today. He left the train at Omaha.

Oct. 30, Monday.

Reached Chicago 11:30 A.M.  
Had lunch and then was at the field museum for an hour or so. Saw Com. Lagovets & Gerhard.  
Left Chicago via B. & O. 5:45 P.M.

Oct. 31, Tuesday.

Arrived Washington 4:45 P.M.

Expenditures Oct. 1916

Amount available at begining of month	335.83
Total expenditures	234.64
unexpended balance	101.19

Items of expenditure

Expense vouchers	123.41
transportation requests	70.23
Sackett Form 3	27.00
Schramm Johnson Form 5	2.30
Overland Lumber Co	<u>11.70</u>
	234.64

E. M. Sackett

Time October 1916

1 3 4 15 16 17 18 19 20 21 22 23 24  
1 1 0 1 0 0 1 1 1 1 1 1

Launch

October 1916

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24  
1 1 1 1 0 0 0 1 1 0 1 1 1 1 1 1 0 1 1 1 1 1 1 1  
cook.