JOURNAL 1940

JAMES W. BEE

— FIELD NOTES 1940 —

1-4-40

This evening as well as evening of last has been excessively foggy with unusual amount of precipitation and moisture in the air. The atmospheric conditions of the air reminded one of the damp, foggy conditions of the coast. Snowed and rained after this seige. These effects are just one of many abnormalities that has ushered in this season. Bad as I have ever abutted.

1-9-40

While running at B.Y. University observed several hopelessbugs on the window sill of a south exposure. Have observed the reoccurrence of the insects on several occasions this winter.

1-12-40

Picture 1-1-12-39 from Campus showing Bonneville terrace. Snow conditions ideal to illustrate this shore line. In the afternoon of the same day Dr. S. E Beck, Harry Chandler and I drove down to mouth of Provo River. Picture 2-1-12-39 indicates the resistence of one willow tree to the invading sheet of ice. One immediately

1-1-12-40

2-1-12-40

3-1-12-40

4-1-12-40

appreciates the forces that change and effect the configuration of the ice shore line and also the punishment inflicted upon the shore line vegetation. Picture 3-1-12-39 shows a typical pile of ice at this time of year with the Wasatch range in the distance, covered with moderate blanket of snow. The picture 4-1-12-39 shows the restricted and limited 'open water' surface where some of the diving ducks were feeding. Recognized the Am. Golden Eye but without aid of binoculars could not define the more distant birds resting & feeding at the outer edge of the open water. Lake frozen solid as far as one could see. Tamarisks and willows nearly cleared by C.C.C boys in preparation for new $1,000,000 recreation center to be establish here.

1-14-40

male and female wooddusk on river about 3 miles down river from Charleston where road comes nearest to road. Observed at 11:30 A.M. On return at 4:30 found 5 golden eye at Williams Fisherman Home some 4 blocks down canyon from Provo Park.

1-16-40

Flicker calling in Provo City near B.Y.U. Not the mating call.

1-18-40

13 Bohemian Waxwing in trees on B.Y.U. campus. Snowing at the time but clear blue skies promised. These birds seemed to be resting.

(see 9-28-40 for complete notes) 1-21-40

Made a few observation of the duck life at the mouth of Provo river where water from river enters the lake, creating an opening in an otherwise frozen lake. The Golden eye, Buffle head, mallard, Gadwald, Pintail were represented. Others not identifiable. Also one Great Blue Heron and several gulls. Several Am. Pipit feeding on edge of ice where water deposited insects on ice

1-26-40

Bees and Hazelder bugs out on window sills. Day fine.

1-28-40

Made another census at mouth of Provo river. Lake frozen but open water at mouth of river. On arrival found one Red billed grebe in river. Instead of diving it gradually subsided and completely disappeared. The process was not abrupt but gradually. This was most interesting when compared with the more forceful and deliberate dives of other water birds. At mouth of river proper at 11:30 found 13 Great Blue Heron. They were generally distributed around the edge of the open water, resting upon the ice. At 1:30 P.M only eight birds (Herons) remained and still resting with necks in wings. Birds represented were: 10 mallards, 6 pintail, 4 Gadwald, 28 Golden eye, 10 Bufflehead, 2 Am (?) merganser, 13 great Blue Heron

2 coot, 8 gulls, song sparrow, marsh → hawks, shrike. → . Others present but could not bring close enough to glasses. When the marsh hawk flew across opening and lit on mat of rushes, there was no signs of anxiety among the ducks. Found the Golden eyes to dive by merely rolling over forward without elevation. The Buffle head were more jerky and forced their dives while the coot literally jumped into the air and then dropped straight down. Recorded the periods of time in which the different species of duck remained submerged while feeding. The Bufflehead dives more rapidly and more energetic and in more rapid succession. Their period of submergence is: 12-16-16-17-17-15-11-8-11-14-13-13-15 seconds. The Golden eyes were cloaked at 16-15-19-16-19-22-25-18-19-23-13-18-21-15 seconds for the ♀ and 19. 20-15 seconds for the ♂. Sometimes the ♀ upon emergeng from its dive come to surface with neck held low and partly held in water as if expecting an intruder. The ♀'s seem to dominate the males and frequently drive them off. Drove out to end of river on frozen surface but on return found the substratum soft with the result that a team of horses was employed to pull car back to main road.

2-4-40

Mary & I drove out to second dugway to get some oranges from road peddler. On return took a panoramic of mts, east of Provo from delta looking across Provo Rumbottoms Their numbers are 1-2-4-40 and 2-4-40.

1-2-4-40 2-2-4-40

Find that there is an excellent stratographical focus on the east side of delta where one could easily record the entire sequence without much difficulty. This area, and where panoramic was taken is located out 3 block


West
Nuciprapa C.

south of 400204-4 → where State Road → starts up first dugway. The second stop was made to examine stratigraphy of delta bank. while pausing. here observed an interesting sky line silouette and could not help but waste another film so as a result have picture no. 3-2-4-40. The panoramic can be used for comparing snow deposit on mountains from year to year. Find that the creek below is choked with vegetation and supports a great number of water forms as crustaceans etc. Otherwise surrounding still in a typical winter appearance.

3-2-4-40

2-11-40

This afternoon drove up American Fork Canyon to forks and then up north fork to skiing area. Find snow not quite as deep as normal. On return followed along lake shore at Geneva. Lake entirely free of ice. Few ice files remain on edge. One lone canadian Goose in field above bench. and 3 blackes from lake shore. 120 horned lakes associated with it.

2-14-40

120 Bohemian waxwing at B.Y.U Campus. Flying in flock.

2-16-40

Considerable snow last three days. Clear today. Flock of N. Evening Grosbeaks in city.

2-25-40

made ski trip today up American Fork Canyon. Harry Chandler accompanied me on this trip. Left Provo at 5:00 A.M and arrived at the junction of the North Fork, Southfork of American Fork Canyon at 6:00 A.M. Road in Good condition the entire distance up the Canyon. Found the moonlight spotting the entire mountain in a most impressive manner, particularly upon the west exposure of Timpanogos. Snow not as deep in Canyon as of previous year but probably has more water content. Left car at junct-

1-2-25-40

and only 400225-5 a block or so before on trail for first signs of daybreak appeared. Very little breeze and snow surface crusted like steel. There is nothing more enjoyable and inspiring than these early morning ascents upon a snow surface. Our destination was to be the high point on ridge directly east of the junction of the forks and our plan of attack was to follow up the south fork to mutual Dell and then up Conifer Canyon to the east to head as indicated in picture 2-2-25-39 at flat just below the fence line as shown, hence up hanging bench to the north and then on top. From the top we were to drop down to the north and eventually to arrive at ski lift flat or Deer Creek Flats in the North Fork of American Fork. As daybreak continued we found ourselves well along the way. The only lifeless thing observed was the Water Ouzel which was seen flying up and down the creek. Evidence of several deer tracks crossing road at lower limits of the Canyon. In several of the road cuts observed arriving of both Glacial boulders and regular streambed and non-erosional boulders, which would indicate that possibly glacial boulders were at one time placed high upon the walls of the Canyon and then brought down to present position in bottom of canyon by lateral mudslides and hillside erosion, because it may be doubtful that glacier tongues ever reached these lower limits as glaciers.


BAS. UPPER AM. FORK CIRQUE
9,500
TIMPOONEKE CIRQUE
BASAL CIRQUE
BADGER FLAT
SUMMER CAMP

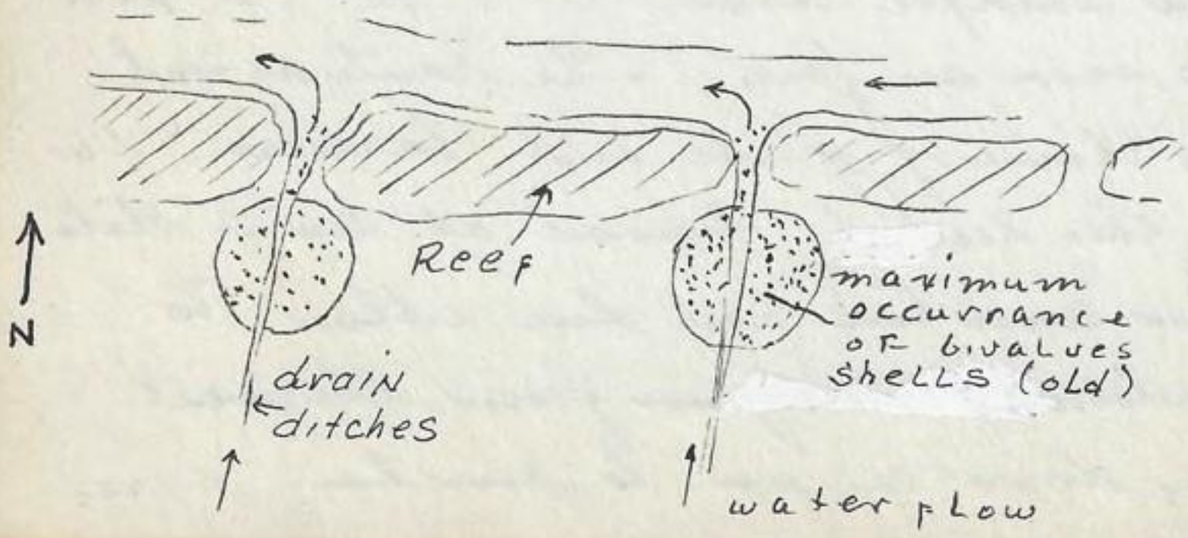
Several erosional surfaces were exposed on faces of new road cuts. Passed through mutual dell and soon at mouth of Conifer Canyon where good trail leaves main road. From the main road at the first switchback observed the interesting obstructions at the mouth of Bear Canyon directly above Mutual dell. Almost at lost to offer an explanation for this occurrance. It is very apparent that a large mound or accumulation at one time had issued from Bear Canyon and superimposed itself upon the main canyon floor and since then the waters of Bear Canyon have partially severed the accumulation from ~~the~~ the mouth of Bear Canyon. There are so many geological problems to be explained and interpreted that it would almost call for a full days observations from any point on the high east ridge; problems from Cretaceous erosions to present erosion. and of all points on Timpanogas I think the north ~~west~~ is ~~most~~ more typical of these erosional features. Left main road and started up trail in the Conifer Canyon. at the mouth and on north side observed some exceptionally large corals some measuring 5 and 6 inches in length. In places snow remained only in trail proper and few on either side. Strata dip steeply here to the south. Continued up trail and find that in the more protected portions of the trail the snow surface was soft and not to severely crusted. Several Snowshoe rabbit tracks and two porky trails. Heard several Tamiasciurus calls on the conifer populated south side. This area would make an ideal area for population study of these animals as it is more or less restricted. The area and conifer stand appears to me to be a new stand because of their uniform size and heighth, probably reinvasion of after a burn out. Arrived at flat at 9:00 A.M. From here worked north along a bench of probable Miocene (?) age, finally arriving at head and on ridge proper. Found a conifer seed on snow. Halfway up this bench and among the aspens found where a coyote had dug down through the snow to a dead deer and had made a feast upon its remains. One area 10 feet away showed the remains of fur and a scapular bone. Another area showed matted surface. 30 feet away was located a cup shape concavity about the size of a curled coyote and looked as if it might of remained near cache overnight. A coyote trail had been in evidence since we left main road. At edge of elevated bench found large snow drift created from main canyon. From head of this canyon continued west to high Prominent Peak where we remained for some time and had dinner overlooking the country as recorded in panoramic picture. Pictures 1-2-3-4-5-2-25-39 were taken from this point just before misty atmosphere encroached. This lazy

atmosphere ruined an otherwise excellent opportunity to photograph the thermometer mountain and the granite range to the north as well as mill peak to the east. Mill peak, however, flattens out at this elevation. The panoramic picture from the dining peak presents a study for any geologest, showing possibly a Moraine or Pliocene erosional surface at the upper levels of Am. Fork Canyon; the successive Pleistocene stages of erosion, differential erosion etc. After lunch went down slope to north. Snow shoe rabbit tracks and coyote. The top of this main ridge is more or less flat but with abrupt sides indicating that possibly it represents the same erosional level as is found evident on all sides particularly between either side of American Fork Canyon and Timpoonicke Basin level. On flat south of an interesting group of conifers was found a relatively fresh digging with dirt piled upon the snow. The time of digging could have been, however, very old. The chamber leading down was large enough to permit the passage of a Coyote but was more in the order of a Badge hole although no conspicuous claw marks were evident on sides of hole. From here passed north toward brink of ridge and passed through a group of abies concolor which were more or less isolated but were very old in age, some being over three feet in diameter. The largest one on the west side being fire scared at its base. From here one receives a most impressive view of Timpanogos to the south. A snow shoe was seen running across opening among aspens but associated with these conifers. Soon arrived at the north side of ridge at a point where one can easily descent. Many places are bared by cliff barriers. One receives a remarkable picture of Thermometer mountain and a fair view of the granite range, both worthy of a picture, however atmosphere conditions did not allow for pictures now. Waxed skis and were soon on down grade. From the top of this ridge to Deer Creek flats in north fork of American Fork offers one of the most interesting and pleasurable descents. The entire distance is a succession of irregular erosional benches like terminal moraines which allows one to rapidly glide down hillside to small flat and then on to next set of flats. The exposure is good and enough aspen trees to make the run more interesting and difficult, at least difficult enough to require a few simple turns, more or less, as well as to provide good protection to the snow surface. The route is not confining and allows for a wide choice of grade and barriers. Observed another snowshoe active on this descent. Arrived at Deer Cr. Flats with snows rather wet. This snow condition was due either to lower elevation or to the warm storm flowing in from the west. Crossed the creek and soon working down Canyon to junction were

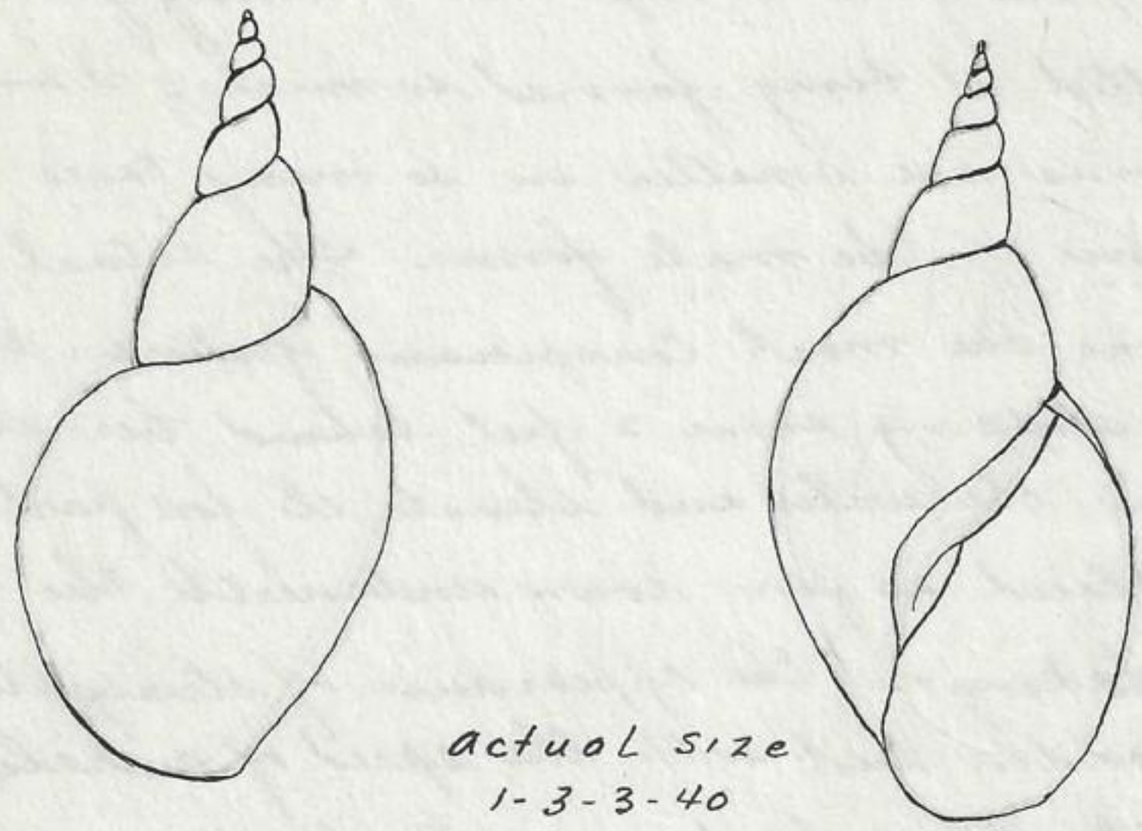
we had left car early this morning. By the time we were out of the canyon the sun was setting, so represented a trip from day break to sun-down. The trip was not recorded specifically so can only make a few generalized conclusions: Bird life very scarce except for two Water Ouzel and several groups of chickadees. One group of chickadees on top was definitely the Rkt. Chickadee. Coyote tracks general as well as rabbit tracks. Few mice trails. No evidence of deer tracks at higher elevation.

3-3-40

Left Sunday at noon and drove down to the reef and channel of Bravo Bayou Mud Lake. Found the roads in the usual condition for this time of year, just dry enough to run without danger of getting stucks. The ground surface and field were damp in the main, particularly in the old river channel course that at one time wound itself down through these fields. Appears of environment rather dead. Meadowlark common with several flocks of American pipit feeding along fence line and in road. Marsh hawks occasionally seen. Arrived at reef with car which was parked only 3 hundred feet or so from the point where the dredged channel crosses the reef. Things have certainly gone through a decided change with Tamarix and willow having reached a great size on a reef that had never supported such growths or even had these species represented. Except for a 50 foot opening north of reef the entire bay is choked with rushes. The south side is similar except more clear areas are free of rushes. Years ago either side of the reef was represented by large bodies of open water. Water from the south side of reef now drains by ditches to the north and across the reef thence west until it reaches the [redacted] canal that intercepts the reef. This movement is just reverse to what it was years ago when water on north side of reef flowed south across the reef. Spent several hours in all conditions and in area where years ago I had found the bivalve common but no evidence of them now. They just are not here [redacted] except their shells. Where drain ditches have been dug through the old natural channels across the reef one finds the greatest accumulation of bivalves as indicated. Years ago the water flowed in the opposite direction and the currents brought food across at this point with the result



that the bivalves congregated here in greater numbers. This correlates with the finding of live forms 7 years ago at these particular points. At the end of the reef I found several thousand ducks and seven geese in open water to the north. Partially concealed myself in dead rushes on reef and awaited their return after they were frightened away by my approach. They soon returned and settled down upon the water. Movement of smaller flocks more or less spasmodic. The species represented according to their frequency of predominancy are as follows, the order listed forms only approximate:

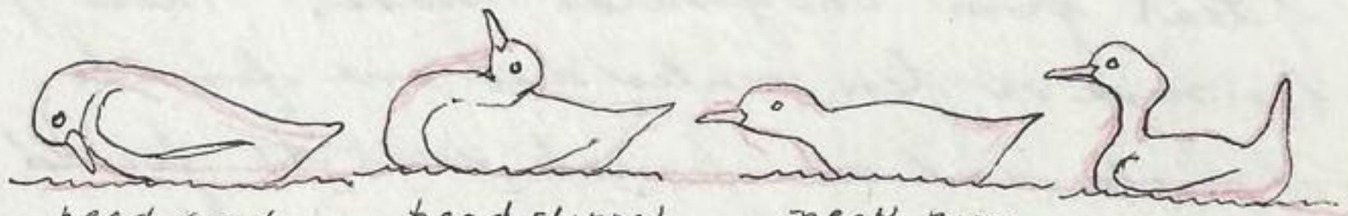


actual size
1-3-3-40

1. Green wing teal. (By far the most common form)
2. Pintail
3. Gadwall
4. Shovellers
5. Baldpate (just a few)
6. Mallards.
7. Canadian Geese (seven geese)
8. Cinnamon Teal (4 of these teal)
9. Lesser Yellowlegs. (1 bird)

The courtship mannerisms of the green-wing teal and their actions is worthy of recording. One cow picks out small groups of teal from the general mass of ducks. These groups are generally represented by nine or ten males and one female. In general the group of males and one female will be found to be moving more rapidly not forward, but among themselves, and are therefore more conspicious as viewed as a group among the entire mass of ducks. This courtship group represents male birds vieing for their female partner. Their manner and tactics at vieing their opposite sex is most interest and probably facinating to the female which appears to be quite confused but not annoyed. The procedure of an individual male would be to swim by the female from front to back and then return. At each destination it would perform its courtship jig. These males in all their activity did not appeared to directly concerned with the female or at least their efforts were all executed with the purpose of influencing the female yet they

did not → want the female. to know that they were concerned with her. One could not but help compare the males actions with a small shool boy "showing off" before his girl friend. The males did not at any time approach the female directly or did they at any time, while observed actually contact or chase the female. Actions were carried on generally in front of her or in back of here some two feet away. The persistent following of the female kept her turning from side to side and confusion resulted at being favored so much. I wonder if possibly the female forms are smaller in so many cases because of the ~~their~~ continual annoyance of the male forms. The actual courtship display of the male was the most conspicuous feature. After gliding by the femal and stopping some 2 feet behind her, it would partially raise its body from the water and elevate its fore part. The head and bill was then placed as far down underneath the body over its breast as possible, taking on the appearance of straighting its feathers, then all of a sudden and with the speed of a released spring it would throw its head back over its back and then thrust it forward. This flipping of the head from its position under its breast to the position over its back is most conspicuous. The last act is for the bird to raise head with outstretched neck and at the same time raise tail. This movement remmoded one of a ballet dancer throwing her head back and kicking it with her foot. After the head and tail are raised it folled back immediately to its normal position. The three parts of the display are followed in rapid succession without any pause between. The acts of this drama could be crudely diagramed as follows: The entire performance doesn't take over 4 seconds. I noticed that there were many pairs of greenwing already established and the usual action of the male was to merely elevate head in a succession of jerky movements. Another interesting thing to occur during my stay here was the concern of my terrier dog's presence. The ducks had sensed and knew nothing of his presence although they could see me in partial view and their disturbance indicated it. The dog remain concealed as long as his patience would last and then walk out into water in front of me some 10-15 feet. Had my glasses trained upon the duck just before dog stepped out.



head and neck drown down under body.

head flipped back over breast to this position

neck force forword

Head and tail thrown high and at the same time

into plain view and the picture was one of a heterogeneous movement. As soon, however, as they caught a glimpse of the dog, and that was almost instantaneously, the movement changed from one of random direction to one of a uniform and consistent direction toward the dog. It was certainly a interesting site to see this directed movement from the original cluttered and hapless movement seen only a few seconds before. The dog effect all species of ducks. They had been congregated some 200 feet from the blind but were now making a direct beline toward dog which was just in front of me. They kept streaming foreword until within 20-25 feet of our station. I purposely made movements of my hands, legs & head and within plain view of birds but they entirely ignored me even though they clearly concened of my presence. Their great concern was with the dog which stood 10 feet in front of me. and the curiosity was so great and controlling that they absolutely ignored a danger that they had evaded before the appearance of the dog. Why this should be I do not know but it an intrusive thing, although rather hard to believe. I no doubt myself will disregard the facts as time passes on but nevertheless it remains a fact as directly observed. After about 5 minutes I partially raised myself and the front line of bird flew back a little ways. At a half-way bend of body they flew away to main flock and as soon as I stood directly up the entire thousands of ducks raised simultaneously and left the open body of water where they had been feeding. The upright posture is the posture that sends all forms of wild life on the run. Remained at the east end of reef only long enough to investigate the area for clams and snails and to inspect the indean burial grounds. Except for a few small rocks no evidence remained. No bones or larger rocks were visibely as was once found. On the reef above the water line and practically along its entire course were evidences of broken manos, metates etc. From the reef proper followed S.W along the south side of the artifical drainage channel. At point where channel empties into main natural channel found it necessary to back travel to the east to cross the creek approaching from the S. East. This creek has a defined bank on the south side. A field has been plowed south of here and being a former lake bed & channel supported great numbers of mollusc shells. No. 1-3-3-39 was taken from this field but to frageal to keep. From here continued west along channel and hence south along shore line of Utah lake to artesian well some 3 blocks to the south.

found that → the lake ← shore line from the Mud Lake-Utah Lake channel, south was matted for 10-30 feet back with bush stems This collection of rushes which covered the shore line were either from the mud lake area and had drifted south upon entering Utah Lake or were the results of the cutting ice floes of Utah Lake proper. Returned after getting drink at well. Frognutes still in large stands at channel. Hundreds of Redwings were collected in Tamarix on south side of channel and were raising the clouds with their song. Sun now getting low. At the water gauge gates on south cruck found 2 Great blue heron. They left and are returned and circled over head and calling like they do when on their breeding grounds. The day was noduout the subject of this unrelated curiosity. In crossing north to drainage canal found that the cockleburrs litterally carpeted the surface of the dry lake bed as the result of a fire that had swept through there at one time and had burned out everything except the burrs. Returned to car as sun just sunk behind distant ranges. The fire that had been purposely started at the extreme east end of rushes of old mud lake was now burning furiously along the entire front sending flames high into the air and unfolding a column of smoke sky-high. 28 Canadian Geese crossed the western skyline toward the north as they left mud lake to fly to the big lake, Other geese were still calling to the north, probably preparing to leave however. On road from lake area saw one jack rabbit. The most upsetting feature of the entire trip besides the frequent and undetermineable bumps in the road way was the realization that him alone had completely destroyed the true value of this marsh land which once was such an enjoyment & thrill to visit years ago. Nor will it be a very simple thing to bring back this lake to its former state by merely damming off the channal. If however a project is instegated to construct such a dam the results will be artificial. While they may bring back certain forms in great numbers the balance will not be there. and without a balance which is natural, what do we have? Nothing but an artificially created by man which for many has no value of a finer or worthwhile nature We will be satisfied with unnatural creatings for a few years but the time will come when natural processes will be as significant a any religion. In conclusions. Mud lake can be brought back as a natural asset but the scares ~~with~~ can only be obliterated after a period of 40 or 50 years of protection from man.

3-8-30

Observed approximately 65 Western Evening Grosbeaks on way home from the University. Feeding on the ground beneath a small peach(?) tree at 3rd east and 6th north, Provo, Utah

3-9-40

First evidence of California Gull flying over Provo City this year.

3-12-40

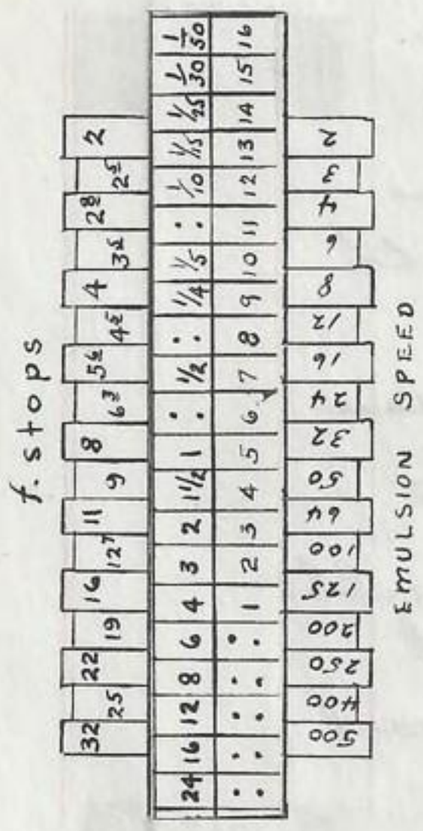
W. Evening Grosbeaks in evidence at Provo. Greatest waxwing movement passed with greatest congregations about 12 days ago. Cedar Waxwings follow Bohemian Waxwings it appears. Song Sparrow at Campus has offered occasional song throughout winter. Day extremely wind with occasional rain or snow.

3-16-40

Insects, particularly the Bees out in great numbers around the maple trees.

3-21-40

This morning placed the Sandhill Crane in outside pen. Upon entering the pen it had occasion to pass the dish pan of water placed there for its drinking purpose. It stopped and immediately and quickly picked off the surface of the water six dead flies which had been caught. They were acquired at the rate of one fly per second. There was also a dead hornet on the water surface among the flies but the crane expressed a decided preference for the flies. After eating all the flies it recognized the hornet by picking it up he it was immediately rejected. There was here in this case an unhesitating choice for the flies and a trial & rejection of a hornet. Fed the bird this morning 3/4 cup of dried raisins which were eaten without hesitation or any signs of disapproval or rejection. When the crane was allowed to feed directly from the cup or raisins placed upon the ground would take them, one at a time at about 1 1/2 raisins per second. The raisin pile on the ground was eaten by taking one at a time but raisins held in cup were considered collectively and frequently 2 or three were taken at a time. Fed several raisin by holding tight between fingers. The dislodging was mainly effected by turning the head and prying. When raisins were not fed fast enough the bird would reach over and take them directly from the cup which was held in other hand. Regardless of whether the bird could see the raisins in the cup or not it would attempt to reach for the raisin which shows a retention of a



thought → and the association → of raisins with the cup. after eating the last raisin in the cup a hornet alighted upon the rim but the bird did not make any attempt at getting it. Raisins held one inch higher than the bird could reach were not taken. At no time when the raisins were taken from the hand or cup were they placed by the bird in the water which was only 1 foot away, but when raisins were taken from the ground among the dirt and debris of straw they were frequently washed in the water whenever the raisin supported too much foreign material. In one case a raisin was washed which appeared to me to be free of any foreign particles. The procedure of washing is regular and in this above case as follows: The pan of water, in the first place, is 8 inches high, 10 inches wide and 14 inches long. It held 3 inches of dirty water at the time. The bird would pick up a raisin from the ground and if it did ~~not~~ hold a particle of straw, etc would first shake it with a jerk and if after such a shaking would still remain, it would turn to water and place bill and raisin in water. The first movement is a quick push foreward of the head & bill, rubbing solidly upon the bottom of the pan as it was pushed along. At the end of this foreward stroke the raisin & debris was shaken vigorously in attempt to dislodge the foreign particle which had been partially loosened by the rubbing upon the bottom of the pan. The rubbing is made by one simple foreward thrust of the bill. If the raisin is dropped in the pan it is soon retrieved by probing with bill partially open, a blind attempt as far as visibility is concerned. However the rain is soon found by the sensitive probing bill, shaken again and then eaten. The procedure in eating these raisin as well as any other type of food is to pick it up with the ends of the bill and then by opening mouth and quickly thrusting head foreword causes the raisin to be placed far enough back in the mouth ~~to~~ so that the tongues can

can became effective in transporting the food beyond → to the throat. This procedure is suggestive of the bird throwing the food back into mauth but the thing that appears to me is that the food remains momentarily stationary while it is the head and bill that moves foreword, thereby placing food back farther in bill. It will eat contineually from the ground without raising its head with the food running counter to the laws of gravity. In drinking water the bill is held from a nearly horizotal positbin to a nearly vertical position. The tendency is however to bring the bill to a horizantal plane. when drinking. It normally supps up water for 2 or three seconds and then quickly raises head / neck so that water might run back into the throat or at least to where the tongue can help to move it on. As far as I could tell the water does not pass beyond mouth while actually drinking. When head is raised a considerable portion of water runs off bell and down side of neck feathers. Water is kept below the distal border of the nostril at least not beyond and covering nosils. The drinking process is repeated several times. Its manner of resting other than the standing position is to gently drop back on to its heals with feet directed foreward in a paralell manner. no part of the body touches the ground in this position. It generally remains such for a few minutes before dropping body down to the surface of the ground. Frequently when standing in this crouched appearing manner will walk or better crawl foreward for several feet as it pokes its bell here and there in the debris. This position is logically the normal position as the bird is standing now upon the entire foot rather than the toes. Its normal resting position is with entire body and good portion of lower neck resting upon the ground. When resting frequently picks up assorted debris about this surface in reach. Have not as yet observed the bird to rest entire neck upon the ground, or back or in feathers of wing. An examination of the pen floor reveals the presence of numerous holes and partial excavations as if an attempt had been made to get food which normal is found and grows beneath the surface of the ground. My suspecion would be that the normal food is in the form of a root, a bulb, a bivalve, or some other form of life that dwells beneath the surface of the ground or shallow marsh floor. Its attempts are so

forceful → 400321-16 ← that one is led to believe that the same procedure in nature is essentially employed in moderately solid soil and not in a mud or loose water constaint soil. Its bill is used as a pick and pry in the operation. The gape of the bill when used in probing is from 1/8 to 1 1/2 inches This partially opened bill is then thrusted into the ground or debris of straw in quick succession with a good deal of force behind it. After sinking its drill down so far into the soil it will widen the hole by making a lateral switch or jerk of the head which tears away the sides of the hole and disposes of any debris that might have accumulated in the operation. This somewhat blind testing of the soil is probobly an attempt to locate a solid object which when located is brought to the surface, sometimie with a good deal of effort upon the birds neck and bill by its prying practice or general excavation of the immediate area around the object. Have actually observed it to bring to light rocks and small objects which were buried 3 inches below the surface. One object measured 1/2 inch square. The most interesting interesting feature about this probing tactic is the partially opened bill while digging. If a leave or portion of a straw is pierced it is ~~dislodged~~ dislodged with a quick jerk of the head. It is very alert to the presence of anything that is thrown over its head or back, responding by ducking and jumping to one side.

3/22/40

Sandhill crane 50 dried raisins this morning in apprat. 60 seconds.. Took as many as 8 raisins in 5 second, one at a time. When raisins are placed on a plate it has a more difficult time in picking up the individual raisins, sometimes taking three picks with head turned to one side, before it gains them. When inspecting food as insects or worms held in the hand will barely touch it and when taking them only with a great expression of tenderness and lightness of a feather. However if one held a coin or unatural object in one hand and fingers will pull & pry for all its worth. It can pick up a small spider, which it truly relishes or an ant with all the lightness of touch and degree of accuracy of any insectivorous warbler. With raisins held in

held tight in fingers or when placed on a stuck plate & when an extra effortion is called upon the neck muscles the resulting strike is not perfect.

3/22/70

Dove Lust reports: Have never observed the sandhill crane along the Colorado River when running the coarse but find them in south eastern Wayne County on the sand knolls of the open country. The Great Blue Heron is at home on the river in Glen Canyon and is generally found in pairs but more commonly as a solitary bird. They are found on sandbars in river and along the sides of the river where they remain until boat approaches too near whereupon they flew down river around the next turn where they remain until approached again. Such a sight is common and many birds fly for miles down the canyon as guides and leaders of the party. The alcoves and lateral canyons entering the main canyon are found to support luxuriant semi-tropical appearing vegetation in a natural and primitive state. The soils are rich with the moisture inducive to rank growths of vegetation. The protection of the confining walls also help to promote a growth of a species that upon the higher windswept, sun exposed open plateau above the walls of the canyon are dwarfed and barely existing with the rigors of the cruder environment. This secluded vegetation cannot be called typical nor can one use it as a standard for what might have occurred on the upper levels before mans influence. In my last 50 years have noticed a direct & somewhat drastic change in the disappearance of the grasses from southern Utah. They have not only been subjected to abuse but have been annihilated. Horse feed now becomes a problem where years ago was not of any concern. He attributes the absence of grasses to the combined effect of sheep, cattle & horse depredations particularly the tramping action of the sheep. Where vegetation roots remain the plant life can be brought back in short order but when annihilated will take 100 years to bring it back by Mother nature. One can travel this country during certain parts of the year and find no apparent traces of grasses but when hit during

the rainy 400322-18 periods one → finds an entirely different picture where grasses spring from apparently nowhere. The Kiabab deer problem directly blamed upon the elimination of the cougar. Doubts whether grasses ever grew upon the more desert like sections. White Heron (probably the snowy & Brewster Egret) are found along the river but generally in group and not as regularly found. Beaver plentiful. Labyrinth and Glen Canyon are excellent areas where primitive and a prolific state of flora exists. This summer we expect to visit a canyon running into the Escalante river that has never been visited by white man. Our only way of entering appears to be dependent upon finding an indian trail of toe steps in the rock walls. Mr. Baker reports the canyon. He has cattle in nearly every accessible canyon of this country.

3/23/40

Ted Tibbett of Moab and a student at the University reports a colony of 36 Great Blue Heron nesting in cliffs along the Colorado River at the south end of the valley. These 18 nests are placed in cliffs about a block away from the river & marsh area. The nests are placed upon a shelf of a cliff that is inaccessible to cattle, sheep, horses etc but accessible to probably coyote, fox and man. He knows of no other such nesting in cliffs.

Antilope Island of Great Salt Lake, Utah 3/24/40

Spent 2 days on this Island tracing down the authenty of an alleged report of the Bald Eagle nesting upon the Island. The government trapper had reported that last year he had observed both the parents and young birds on the island but had never actually observed the nest of the eagle. They report on the island that a dead bald eagle had been picked up last December on the west side of the island. One would naturally suppose that these birds had been native breeders on the island last year but one cannot be too positive about it. From such evidence it is just as likely that the bald eagle could have nested elsewhere and have brought their young over to this island later. Ted reports it having been observed on the Farmington Wild Life Refuge of last winter. Ted and I picked up Mr Daynes and Dick at Salt Lake and were soon on our way. Dan had received permission from Mr. Eggenbottom of Salt Lake who is responsible for the running

running of the Dooley-Bamberger Estate and is the father of Bill at the University here at Provo. The island. Mr. Diggenbothum itinerary
west along the air-port road is definite but from the place where one leaves the main highway before arriving at the K.S.L. Radio towers, to the island is a course that can hardly be designated by map or description. The road toward the lake passes through dwarfed greasewood and sarcobatus with Artemesia present at places. Don pointed out several places where he & Aldous had collected shore birds, places that now are dry, barren and effected by evelegation. as one approaches the edge of the present lake shore line he finds large inland bays and recesses where water stood not long ago. The road follows along the lines of least resistence but mainly along the natural dikes and intervening dry land. The actual front shore line is a north south accumulation of sands & rankest growths of vegetation. The shore line is well established & water must have remained at this level for some time as no other noticeable lines were crossed farther back to the east. From this point to the main land of the island is, I would judge, about 3 miles and represents the closest point to bridge the island with the main land. If such a condition ever existed before in the distant past one could see how it might be possible for such animals as the Perognathus, Perthrodontomys, Dipodamys and other to reach the main land providing that a drift line of vegetation was established along the water edge. however rivers are now choke of their debris Such forms as the Dipodomys might even decide to cross upon the dry sands themselves, particularly if these sands had been blown up into drifts. With the case of the Gopher would say that the lake bed country intervening is probably too inhastal to migration except possible in winter time when they could use the snow as a medium to burrow through but such a distance is probably to great to allow for such a migration. See no reason why rabbits should have any trouble in passing freely from one side to another. Crossed this lake bed and soon on the island. The sands were damp except in ruts of car tracks where it was dry. At one place we crossed an inlet of water 100 feet wide which had a solid bottom. Another arm of water was crossed near the island shore line itself. One of the most interesting features observed crossing these sands was the mirages on all sides where one would bet his own life upon the presence of water which later turned out to be land. One is particularly impressed when starting out across these sand with water on all side and in front with no outlook of a possible dry land route across this gap. Up to this point have observed the raven, blue bird and horned larks. From the point

on the → island where we ← arrived was only a short distance from the
pier on the south end of the island. Continued north and arrived at
the ranch where we received permission to camp on the island by
mr. dooley who was there at the time. He reports 21 buffalo
on island. His last hunter on the Island was some European duke.
He charges $75.00 for hunting priveledge. Observed three buffalo hides
ready to be shipped to Salt Lake and one muskrat body which had
been skinned. Of recent years the common norwegian coarf rats
have invaded the island and found not only around the farm
house but on every point of the island. They keep reappearing at
the ranch whenever locally exterminated. While visiting Mr. Dooley
observed an American Eagle flying or rather circling high above
the barn. It remained in vicinity for some time. He also reports
a fire that practically enveloped the entire island last year and
a fire which shows its scars on all sides. With his permission
drove north and gained the bench land just south of the brood
valley near northern end of island. and by driving up this bench
slope finally arrived at a point about 1/2 way between Bonneville &
Provo level. From this camping spot along spring coarse can
see a large isolated outcropping which stood as an island when
water was a hundred or so feet above Provo level. This conspicuous
island is distinct & can be used as a land mark to establish
camp. To the south of the knoll is a large spring some 10 feet
wide while to the north is our canyon where we established our
two day station, arriving at 3:45 P.M. Before going into the field
for the remained of the day prepared a short lunch & set up camp.
As soon as one sets foot upon this island he is impressed with the
difference of the vegetation and floral set-up. The most impressive
difference is the apparent total lack of the oak trees as well as the
cottonwoods. These are replaced by the maples and boulder but
principally the maples which are found generally distributed but
confined to the gullies of the canyons and generally associated with
the spring waters. These trees are well developed and well established
wherever found, some measuring 18 inches in width, some towering
high and others springing out of a common base like a willow group.
Somehow their appearance is different from those of the main land.
Several show signs of weakness and others have fallen over, appearing
as if their vitality had weaked in recent years; even to walk down
through the entanglement gave one the sense of entering a forest
group that had recently been blown over and the limbs and
trunk still settling whenever touched or stepped upon. Their
range & distribution closely follow the distribution of the spring courses.
Their black masses stand out against the generally brushless adjacent benches & ann

400324-21

Along these same water courses and accom- → panying maple and ↑ bofelder
association one find the nests of the magpie, sharpshine hawk(?) and
probably owl. Each canyon supporting as many as 25 such nests.
Some canyons fewer. The other conspicuous tree but somewhat reduced
in numbers in recent years is the juniper. Their range is limited on
the south side but they enjoy a good growth on the west side at about
3/4 way up the island. The slopes and hillside are matted with
grasses and weeds with few bare spots remaining. Upon this matted
surface is found the true buffalo grass and other bunch Grasses
grasses occurring as if the sheep had never grazed upon them. My
picture of the island in my mind and before visiting for the first time
was one of barren rocks and soils destitute of vegetation as is
found on lake ~~Mt~~ and other more typical desert range but the
picture was very different than expected. One can compare it more
favorably to a country golf course than a sheep, cattle and horse
range. Beneath this matted surface is a soil that is deep and
extremely loose and of a very coarse consistency. If the vegetation
were removed would think that the entire island would blow away.
These soils are the result of the action of the ancient lake that
created numerous shore lines upon the entire lower exposures of the mountain.
It is soft to walk upon and gouges created by walking upon them.
The entire east side of mountain support this type of soil while the west
side is devoid to a certain extent of these soils above the Bonneville level which would
indicate that at one time these deposits were blown from the
west exposure up over the mountain and placed on the east side of
the range. This could have occurred during the period of the
early life of the lake, and the period that seems more logical, or
during a subsequent period when the island was rid of its vegetat-
ion and the soils were able to shift about. These loose soils have originally
been broken down by wave action from the grasses and solusts that
constitute the lithology of the range. These rock are highly complex
and show considerable stress / strain having been exerted upon
them at one time or other. At the point we visited found them
in stratified position and dipping abruptly to the west. Several
dikes cut through both the slate structures as well as the solid
more quartsite like rocks. The springs of the island are relatively
numerous and are just as sweet as our snow fed waters. One finds
fresh water nearly the entire circumference of the island at the lake
shore line. The springs that originate above the shore like are
intermittent and generally sink as they approach the Bnnv level
deposits. Many of the springs, which are found in nearly every
main canyon, arise near the Bonneville level, some higher & some lower.

400324-22

One particular spring of canyon south of us had its source about halfway between Bonneville & Top of mountain. Water, while it is restricted, is certainly not a problem to this mountain. Why this should be the case I do not know because the mountain does not support any large or high water shed. The only apparent explanation is that possibly it taps the water table of the Oquirrh range whose beds dip northerly they plunge into the lake. So much for the general consideration of the island except the status of the Bonneville lake terraces, benches and wave cut terraces. These are so beautifully represented that they need special consideration and attention as they are so clearly and somewhat completely represent here. One is impressed with these feature long before he is actually upon the mountain itself. A few generalized observation were taken and certain tentative deductions made to be used as a bases for discussion + to corroborate certain other theories concerning cycle occurrences and stages of Pleistocence glaciation. As a result of two days on the mountain and investigating at several point would say that the mountain existed as a mountain in the same general proportions before the bonneville lake as it does at present, with the exceptions of valley fillins and erosion of the Bonneville level. Many other stages show considerable wave cut erosion but on the main the general outline is the same. Of course at several points on the Bonneville level the wave action has cut back deeply and created steep west exposures and in two places has actually cut down the ridge and the water have connected with the opposite side created a broad, flat and level pass at the Bonneville level height. Other levels where rock structure was favorable, considerable erosion resulted. The degree of slope of the mountain is found to be in three degrees; the upper steep reposes not effected directly by the water action; the slopes of the Bonneville-Provo stage; and the gentle slopes of the Post Provo level stage. The most impressive feature of the shore lines is their regularity and somewhat cyclic nature of their occurrence. The shore lines as they appeared to me seem to indicate definite cycle, both in respect to a major division as well as minor & secondary swings. Not all these divisions are recognizable at any one point but by correlating the classical sections from many areas of the island was able to reconstruct the map on other page.

(Dates from Science 27 Dec, 1957)

Bonneville
- 23,150 ± 1000 tufa on boulder
- 14,100 ± 350 tufa on cobblestones
- 23,300 ± 800 marl
- 21,200 ± 450 above the above level

Lake bed at high water level
- 12,500 ± 250 above layer 14-16' deep
- 26,300 ± 1100 organic layer 30-32' deep
- 25,300 ± 1000 inorganic layer "

SOLID ROCK

Bonneville

NOTE

MAJOR

NOTE

LESSER

MINOR

Boulder
Large aggravation

Finer sands, coarse gravels and, Few Large boulders

PROVO

MINOR

PROVO

10,900 ± 400 tufa on outcrop
15,530 ± 280 just below P.L. tufa on outcrop.
33,200 ± 4000 may be contaminated, tufa

Stansbury Level
- 13,200 ± 300 Tufa from gravel bed
- 12,900 ± 800 Tufa on outcrop
- 25,500 ± 1300

Between Stans. And Provo Levels
15,200 ± 400
TUFA.

OR S. LAKE

1000 years
?

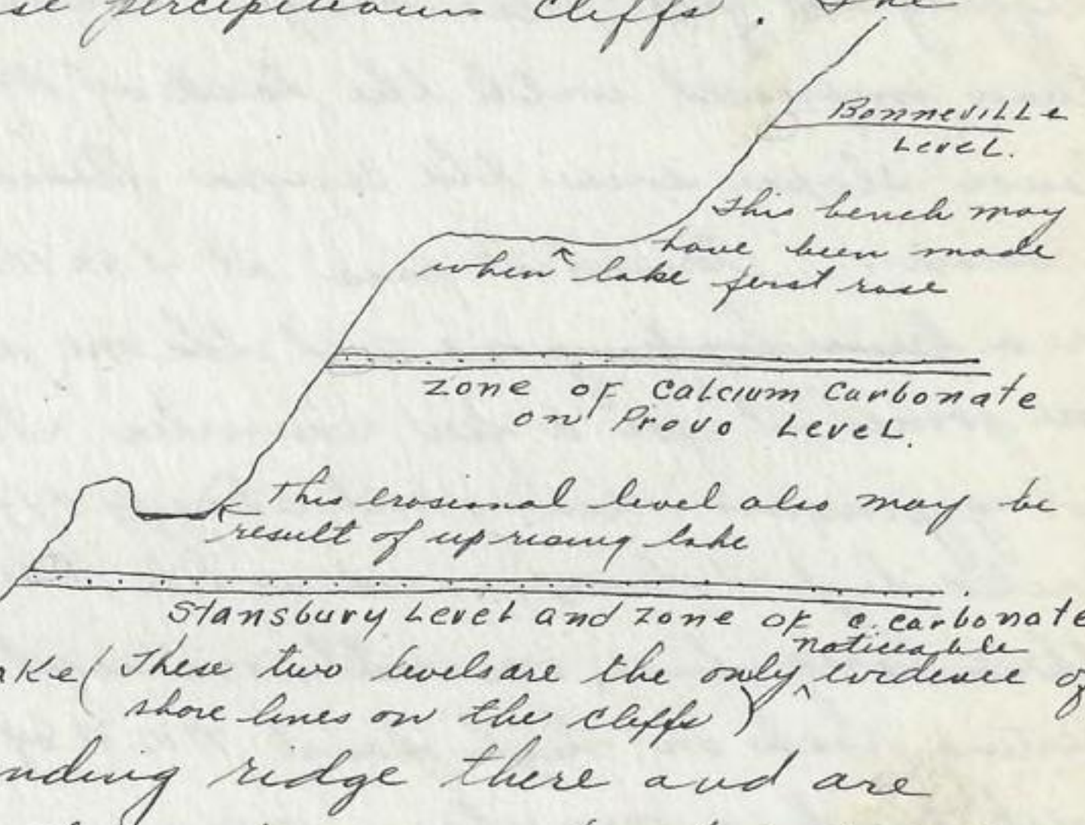
400324-23

SHORE LINES OF BONNEVILLE LAKE, EAST SIDE ANTELOPE ISLAND,
GREAT SALT LAKE, UTAH.
MARCH 24, 1940
J. W. B.

400324-24

The east side of the mountain is by far the best exposure for the levels between the Provo and the Bonneville stages while the west side seems to retain the best evidence of levels below the Provo stage. If one has never observed the shore lines of this island before one will be very sceptical about the observations & deductions made but one only has to see them to be more than convinced. The island is situated at the end of a direct corridor into the open expanses of Great Salt Lake and those exposure and direct contacts of wave action on the west side were to severe or unfavorable, they were recorded upon the east side or the lee side of island where wave action was indirect. The profile map of entire section indicates that there was probably a cut action of mountain side as the water rose upon the hillside as the lake attempted to establish its greatest heighth and then as lake subsided the present terraced were made upon material flaned upon this older surface. The major cycles are 14 in number and are unbelievably regular. The Bonneville-Provo section has between each major level a minor level of a slightly lesser extent which is evenly spaced between the major level and between the major and lesser level is still a minor level of about 15'-heighth. Below the Provo one finds the major diversions continuing and 4 minor levels between each major leads. Some slopes between major leads are without surficial indications of shore lines & may be due to either a lack of shore lines or they could have been erased by a upward trend of the lake level. The present lake shore level is considered in comparing with regularity and degree of erosion, as a major level and its present day lower level the first minor level. If one knows the age of Lake Bonneville, one can readily calculate the cycles and establish a time scale for the Great Basin since this early pleistocene period. The range of shore lines represent 14 major levels, one lesser stage between major cycles of levels above Provo level, and minor levels ranging on the average of 4 or 5 to major period or cycle. I will attempt to work out ratios and cycles of ~~this~~ from this evidence to see how closely they compare with cycles established by ring counts, varves etc. An interesting thing occurs upon the west side of the island at the north end of broad exposures of southern half of island or on the south side of main mountain mass that extends west from main ridge of island. Here, and at other point however, one finds upon the steep soled and bare rock cliffs the signs of the Provo and Stansbury level as evidenced from the precipitation of

a single line of calcium carbonate upon the sides of the cliffs
Did not see evidence of such deposits at the Bonneville level.
These levels are the only ones that have left the layer of calcium
carbonate, even the intervening areas between these levels
show no signs of erosion on these precipitean cliffs. The
Stansbury level appear to be
lower than normal but was
examined from a high point
& one can easily misjudge
elevations. The partial island
to the far north end shows
the major periods of the Bon-
neville-Provo levels better than
at any other point. They are



found upon the east-west trending ridge there and are
beautifully exposed as regular steps from our position some
distant south. On the east side of island is found a small
peninsular running out into the lake. North is found water while
south of it is more or less free of water except a few fresh water springs
near the shore line. On the north side of this peninsula is an
erosional cliff created by the lake in not a too distant past. Last
year dad reported gulls nesting on this main land. So much
for a general discussion of the apparent and conspicuous superficial
features of the island. After lunch of our arrival we made a
short reconnaisance trip to top of ridge overlooking west side of
island, hence northward most conspicuous cliffs and hence back
to camp. Left camp at 4:10 P.M. and between there & Bonneville
level observed several pine siskin, Shufeldt Juncos (?) 15 Uta Stans.
in 200 feet of canyon side on sunny & rocky exposure. 4:18 at
Bonneville level. Three ravin attacking one golden eagle above
high ridge directly west. The eagle continued circling about and
occasionally flinching to attack. The eagle disappeared and
two of the ravin circled & trended south & then north with one
bird acting as an aggressor & keeping immediately in back of the
other one. They would whirl & wheel continually. Probably male
courting female. One of these birds had a call that was given
frequently that sounded like a dog; not its normal call, about
every four minutes. This same persistent following of one ravin
after the other was observed several time both days we were there
At 4:34 P.M. arrived at head of spring of this canyon. Maples continued
about & hundred feet further up canyon but ended abruptly. Water cress

400324-26

grew in spring. Dead puffls(?) here. One finds the spring beauties growing in clusters of 10-15 in the burnt over areas. They and the yellow belled flower are generally distributed upon the entire upper exposures particularly the burnt over sections. Observed first gopher digging 200 feet below ridge. Winter snow fillins only. One is more than impressed with the lack of erosion of these upper, as well as lower slopes. even the canyon floors themselves are free from any erosion. Arrived at pass at 4:52 P.M. 2 golden eagles appeared, one a trim looking one and the one always observed, and another one joined it for a few minutes. This second one was light colored & some wing pinions missing and shaggy appearing. The larger bird soon circled high & disappeared while the trim bird remained and after three long dives, one north, one west & one north again, let on top of resting rock on high point, N.W. N of our station on pass, on the west trending mountain mass. It remained there for the rest 1/2 hour. 8 siskin flew west over the pass. Left divide north at 5:00 P.M with sheep header below to west. His barking dog may have frightened eagle from nesting cliffs to the west. Magpie near top of ridge. Flicker near top of ridge in burnt area of artemesia. Worked north around mt side to point where one can see the conspicuous cliffs on east side. 2 rosin were observed setting together below cliffs on a rock. One flew out and the other did not immediately follow. From here dropped down into maple canyon and hence south again to our station. This latter canyon supported 20 magpie nest or hawk modified nests from the source of maple above to the Bonneville level. where we turned off. Several fresh and large piles of debris from active gophers. These appeared to be the only recent activity but very extensive. 10 bluebird, juncos and siskins also ~~repo~~ recorded in this canyon. Five wood rats running about on top of main ridge at about 6:10 P.M. Arrived at camp at 6:30 P.M and set out trap line research area A-3-24-80 of 64 trap. These traps were placed 10' apart in artemesia bottomed canyon and more or less isolated as far as other artemesia in main canyon were concerned. Rocky side canyon exposures. Water in canyon floor, maples above. 6:00 P.M. had supper and after sat around fire and listened to the owl calls: Could hear the occasional call of the Great Horned Owl. The R.M. Screech owl(?) called all evening 100' from camp. It call is 3 long hoots & followed by 3 short calls. In reality the call more or less decreases in a gradual frequency of individual call notes. This call is repeated about every 8 sec.

It also has a week rapid call. 400324-27

3/25/40

Antelope Island. (second day)
Temperature 45°F at 6:00 A.M. Jaseas calling and chasing one another. Trap line of research area A-3-24-40 revealed the following

1-7 unaffected
8. Peromyscus ①
9-10 unaffected
11 Peromyscus ②
12 Peromyscus ③
13 Reithrodontomys ④ (this trap 1 foot from above)
14-17 unaffected
18. Peromyscus ⑤
19 Peromyscus ⑥
20-24 unaffected
25 Peromyscus ⑦
26-35 unaffected
36 Peromyscus ⑧
37-64 unaffected.

Measurements & preparation of mammals from research area A-3-24-40

(2-3-25-40) Peromyscus m. Sm. 179-71-20.8-♀-24 gr. wt. Six embryos 1½ m.m in natural curled position. On one side of uterus only.

(3-3-25-40) Reithrodontomys 140-69-18.1-♂ 11 grams

(4-3-25-40) Reithrodontomys 154-74-18.7-♀ 18 grams. 4 embryos. 18 m.m in curled position.

(5-3-25-40) Peromyscus 163-71-20-♂ 9 mm testis, 22 gr. wt in body.

(6-3-25-40) Peromyscus 161-72-20.2-♂ 19 gr wt, testis 8 m.m.

(7-3-25-40) Peromyscus 150-64-20.5-♂ 18 gr wt- 7 m.m testis.

(8-3-25-40) Peromyscus 162-72-20.5-♀ 22 gr wt. 5 embryo in one side only. No evidence of embryonic spots on corresponding uterus. 7 m.m. in curled position.

(9-3-25-40) Peromyscus 176-82-20.1-♀-22 grs. 5 x 2 embryos 4 m.m in curled position.

At 6:30 A.M just as sun struck the top of the ridge, two ravens left from vicinity of high cliffs to north & together they flew directly east toward the Wasatch mountains. to the S.E.S. and calling occasionally. Examined a nesting hole of the R. Mt. Screech Owl and called the bird. It chose a maple tree with a hollow cavity with natural hole leading into it. Located on the upper edge of the maple growth in the canyon & on the south side. Entrance to hole also on south side of tree. This bird was undoubt, was responsible for the calls heard last night. This bird (1-3-25-40) measured:

246 length
184 wing
93 tail
42 tarsus
24 toe
160 gr. wt.

♀ Ovary supporting 108 eggs with the largest one measuring 3 m.m ranging down to mere specks. Mounted & deposited in the Brigham Young University.

400325-28

from camp trended S.W to high cliffs to the south and above the Bonneville level. These cliffs are conspicuous and separated by a canyon. On way across these lower terraces had abexcellent opportunity to observed the different levels. On way heard many bird singing and calling. 4 robins, siskens, juncos, bluebirds, pheasant, meadowlarks, and raven calling very frigently. Arrived at Bonneville level below the first set of high cliffs. Was impressed with the accumulation of rocks upon the terrace, an accumulation of boulders deposited after the lowering of the lake. Other larger rocks farther down the slopes below. among this maze of boulders found one cottontail, and 4 rock wren at one place. Heard 4 singing at one time from a position above the level. One marsh hawk flew by along this level to the north. A red-tail also soared in air to the east and finally it lit on juniper at base of next set of cliffs to the south. No nests in north set of cliffs but on examination of the south set of cliffs found one raven nest which was partially built, being built up on the outer rim of nest but nothing on inside of rim or bottom of nest. The material on the outer rim was of ~~so~~ a numerous collection of dry stuks, weeds etc and juniper bark mixed regularly with the sticks. No sign of carpety of rabbit or were they even present in near proximity of nesting cliff. This nest is placed on a rocky cliff on the east exposure where one can ~~so~~ walk right up the to the nest. From here continued south for a peak or so and then trended north on ridge. Found the ravens to interesting in my presence whenever I attained the top of the knolls. Met one raven unexpectantly as it was hovering above a divide. When I made my appearance the raven had a most difficult time in making its getaway as if scared to the extent where it lost its nuclear coordination. Continued north to last pass before the larger mountain peak. Met the rest of the party here and after watching the eagle flying & fussing around to the west, we left for the country to the west where large cliff mass of mountain extends to the west. This cliffy area is the most likely area for the golden eagles nesting territory. Spent the remainder of the day on the west side at this part of the island, investigating both the cliffs on the north as well as the south side but failed to find any indication of either the nesting sites of the raven or the eagle. The eagle nest was not observed until we were ascending up the main ridge on our way back to camp. This nest is located low and on south side of rocky N. E ridge bordering the spring canyon below. Could not definitely tell whether it was supporting green boughs or the bird

400325-29

but was certainly the eagle nest as judged by the size.
Other interesting observation made were: The large roosting or better, resting rock on to of the ridge which was covered with long streaks of white wash. Several other definite resting and observation points were seen. In many section where the sheep could not get were grasses unaffected and enjoying a rank growth. Where the grasses were burned the Oreohelix were more in evidence and found in the more protected portions of the cliffs. Discovered the only likely evidence of the neotoma on the island. Tue was a typical accumulation of racks and stiks & mat material placed in a honeycomb pocket about ½ sq feat. This nest, was hardly large enough in size or material to accomodate a Neotoma & have wondered wether it could have possibly been some other form. The other place was a hole under rock with sticks on ground at entrance but not definitely piled in a pile. The hole had a neotoma odor. Many other caves & holes showed signs of larger animal enhabitaation as the marmot or skunk. There droppings were generally found among all ledges. Bonneville level on these cliff outcroppings are is not distinct. Lower levels show rock polishing & one find beautiful chert & gneiss polished racks. A spring issues from the canyon just east & south of this cliff mass. From the top of this ridge took a picture (2-3-25-40) of the shore line & mountain side to the north, showing the appearance of the shore line and terminal island where Cormorants were found to have nested last year. Also the bonneville terraces are beautifully shown on end island. It is in this N.W. section of the island where the buffalo herd is generally found to occur. From near where this picture was taken collected a Hemiptera (3-3-25-40) from the surface of a cliff on a sunny exposure. A sparrow hawk flew by here. There appears to be a congregation of ravens on high point of main ridge to the east. No rattlesnakes appeared. A coat snake skin was found however but was definitely not a rattler. Dad told me he found the patchnose last year on peninsula in sage brush on east side of the island. From the west side

2-3-25-40

gained 400325-30 ridge and then dropped down to camp. a
↘ dyride of main ↗
Raven nest was located in the white dike north of pass on higher p-
oint. Birds listed for island are:

Western meadowlark
Sparrow hawk
Red. tail Hawk
Golden eagle
Pheasant
Shufeldt (?) Junco
English Sparrow
Robin
Marsh hawk
Short eared Owl
R. Mt. screech Owl.
Magpie
Great horned Owl.
Blue bird
Pine. siskin
Rock Wren
Falcon
Horned Lark
Gull, Calif.

3/27/40

Heard a few W. Evening Grosbeaks and one Waturng in Provo

3/28/40

Rained alnight and clouded the two previous days. Curb and gutters in city filled to capacity and overflowing.

3/28/40

At 3:25 P.M rain turned into slight sleet 2 seconds after wind first arrived at my presence. 5 minutes later it thundered and almost instantaneously the sleet formed into a blizzard and after 5 minutes all was quiet and skies partially clear.

3/29/40

W. Evening Grosbeaks in evidence in City in considerable numbers

3/30/40

Started field Ecology class under C. Lynn Hayward. This Bioecology class is divided into 3 groups of 3 members each with each group carrying on the same routine procedure. The results of each group are compiled and accessible to every individual. Our first trip afield was at the Provo River floodplane to make an aspection study. Purpose. To study and note the seasonal changes in animals of a given locality over two of the spring months. The several times the area investigated will be followed in unform procedure. This floodplone aspection study will be repeated besides today. April 3, April 27, May 4, May 11, may 25. Arrived at the property of the Provo Brick and Tile Co., north of Provo. Established station A-3/30/40 on the west bank of the Provo River. This station is on a typical cottonwood river bottomland of the Provo river situated in the river valley cut between or out of the Provo terrace of Lake Bonneville. The valley is not a typical floodplane or at least does not receive a periodic

covering of outwash material. It appears → to be stable as ← far as land deposition or erosion is concerned. The surface of the area is generally flat but shows the remains of creek channels and river benches & terraces of years ago when the waters of the river were more rampagent and would periodically overflow their banks. Modern agriculture and its ramifications of channels sap the river of its normal flow of water. The ground consistency is essentially ~~to~~ river worn boulders with sand & varying degrees of soil deposit particularly beneath the cottonwood growths where it becomes deep, dark and support considerable humus. The sandy, gravel soils are mainly restricted of clearings and natural openings. This area has been protected for many years and is not typical of the entire river valley floodplane. It has had a certain degree of grazing & woodcutting. but in the main, is nearly a primitive, unaffected site. Such a habitat is favorable for study. Cultivation on west & east sides with farming flats & clearing associated. Used for picnic ground at certain places. Populus angustifolia dominant plant with a few fremontii (?). Alnus tenuifolia, Betula fontinalis-utahensis, acer interius, Ribes aureum, Rosa sp (?), Rhus trilobata, cornus stolonifera, Crataegus rivularis, Salix, Galium, Thistle, Grass, Dandelion, Catnip, Parsnip, Burrdock. Other vegetion present but will identify later. Creeks & springs have not been analyzed. Surface below trees free of grasses and covered with dead leaves. In clearing grass 3 inches high The vegetation just developing buds are the main. Ribes aureum with yellow flowers, most of the small herbs green. Temp. at 9:06 A.M = 11½°C. Ground Temperature = 7½° C. Paper weather reports rain in all adjoining states with Utah occasional rain. Establish research area A-3-30-40 which was to be used as a bird census plat. Sounded in typical area. Plat 150' wide and 600' long. Four operators. 5 minutes ~~as~~ to field at 9:40 A.M Sun breaking thru overcast skies and warming up. Temp = 15° C Combined area of 2 hectors

	Group C.	Group B.	Group A.	total
Pheasant	5		1	6
L.T. Chickadee	3		1	4
Song Sparrow	5			5
Meadowlark	1			1
G.T. Towhee	1			1
Fox Sparrow	1			1
Flicker	1	2	1	4
Sparrow hawk			1	1
Robin	1		5	6
Jay			1	1
Quail			2	2

Estab- 400330-32
→ lished research →
area B-3-30-40. which was 1/10 meter area of soil a depth of 2 inches. all ammals identified and percent frequency record. Taken under partial protection of Populus. Dead leaves as mat. Ground temperature near = 7½ degrees C° Air temperature 18½°C at 10:30 A.M. Forms recorded for our group no C and combined A. B. and C as follows. Combined area = 3/10 of one meter.

	A.	B.	C.
Oreabelid strigoso	7	4	8
Diptera (small)	2		4
white mite		3	11
Collembola (yellow, may be a Thysanura.)	11	7	28
red mite	3	1	3
pale red ant	1		4
Diptera larva	1		
Elaterid (adults)	1	2	3
Arachnida	12	2	2
Elaterid larva			14
Centipeds	1	2	5
Annelid (white)	17	8	1
Annelid (red)			1
Slug			1

	A. B.	C
Diptera larva		4
Carabid		1
a white larva		2
Cut worm		1
collembola (white)	10	1
milliped		1
Porcellio	2	1
Tenib. larva		1
Midge	3	2
Collembola (brown)	1	
Lepidopterous larva	1	
Black ant		6
Crab spider		1
Snail eggs		1
Black Lygaeid		1

Research area 3-3-30-40. Took 48 sweeps through the leaveles herbaceous vegetation which was equivalent to 1 sq. meter. & recorded all ammals as to numbers and kinds. Results: with combined results equal to 3 sq meter:

Herbs

	A.	B.	C.
arachnid	2		
midges			1
miridae	1	1	2
moth		1	
Gall midges		1	

Research area 4-3-30-40. Took 48 sweeps in seedling trees & shrubs as above. Results

	A.	B.	C.
Midges		1	1
Crane fly			1
Black gnat			1
membracidae	1		
Arachnids	2	2	
Cercopelidae			1
Miridae.		3	

Research area 5-3-30-40. Selected three small trees Shook tree over a tree cloth and counted all ammals.

Tree 1. a cottonwood, no leaves, 3 cubic meters, peripheral edge of opening. Results as a combined grouping.

Elateridae	4
Arachnid	6
Chrysomelidae	1
Boleder Bug	3
Coccundelidae	1
Black gnat	1
cut worm	1
Crab spider	1

Tree 2. Acer interiums no leaves, 2 cubic meters
Temperature 22½° C at 11:25. Combined results.

Lepidoptra larva	2
Spider	4
Bopilder bug	6
Cut. worm	1
Elaterid	1
Midge	1
Plecoptera	1

Tree 3. Populus angustifolia. 3 cubic meters, no leaves. Temperature 22½° C. at 11.30. Combined results.

Arachnid	11
Chrysomelidae	1
Mayfly	1
Gnat	1

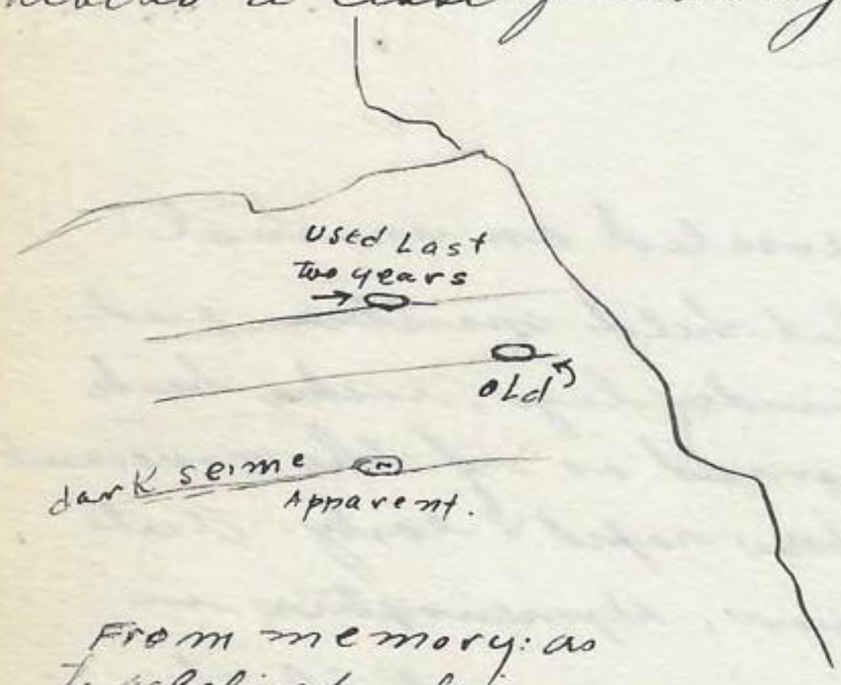
A general inspection of the station revealed an unusual number of insects in any situation that held masture and was protected from the elements as under logs, rocks, bark etc. More insects in tree than imagined as if the movement of insect life from soils to trees had been rapid & early. Ants actvie under stones etc. Bicellus common, Hymenoptera in dead damp wood, Small insect life in air. no activity to speak of around buds of trees.

3/31/40

Dad & I drove up to Wildwood, leaving Provo at 5:00 P.M. Inspected Golden Eagle nest and return to Provo at 7:45 P.M !! Such an act is not frequently repeated when a golden eagle nest visitation is the objective. This is the third consuctive years record of this nest and suspicidly same pair of birds. The first record was given to us by Walfenden of Lehi who states that he observed the young develop and leave the nest. Last year on the April 16 (see notes of both the 16th & 9th of april of last year. And again this year on the 31st we observed again 2 eggs in nest. These eggs are colored as follows: One ½ blocked on one end and the other nearly white but indications of being slightly spotted.

400331-34

I doubt (whether these eagles) will ever be disturbed because of the inaccessible nature of the nests. As we arrived at Wildwood we could see one eagle being attacked by a red-tail (?) on high hill to north of road. Left car at bridge and then went south up mt side to high abrupt cliffs. As we left could here the water ouzel singing near bridges that crosses the north fork near it's mouth. Snow condition nothing like we experienced last year. One or two solid tongues of slide material but general sidehill relatively bare. One could either follow along protected streaks of snow or along the damp bare rocks & soils as he would choose. Prunus or chokecherry buds about 1/4 inches long. Willow catkins developing & give color to bush. Ceanothus green & healthy look. Pachistima regular, otherwise vegetation still slumbering. Hillside damp and wet in several places. Passed up gully past nest cliff and gained top of the cliff above nest before the bird flew off. It did not fly until I actually made my appearance at the edge of cliff when it gracefully bend leasurely dropped over edge of nest and then flew and partially sailed N. E in a straight line. Darkness prohibited a close following of the bird. The nest is placed as recorded last year in the upper nest. This nest cannot be too readily observed until one gains a level with the cliff. From the car one nest is conspicuously placed and another one appears below it but in reality this one is nothing more than a shrub which has the appearance of a nest. This nest was used last year. The most unusual appearance of this nest was the lack of a good covering of conifer boughs. Only two or three small ones were placed on nest. Bird was facing N.W or N.W facing cliff. Eggs in some direction as covering bird. Sun probably never strikes this nest. Left top and descended. About halfway down mt could see bird fly north of nesting cliff over canyon. It flew past nest at close range but continued east along mt side. Was just starting to sprinkle. On our way up at about halfway could see one eagle hunting just east of nesting cliff about 2 blocks. The male (?) did not present itself after ♀ flew off nest. Returned to car and inspected Ouzel nest under cement highway bridge. nest 4 feet above water, loosely placed, both bird roosting 2 and 5 feet away from nest. One 3 feet from other one. One remained at 4 foot distance while flashlight was shown upon it. The other flew



From memory: as to relative position.

The Sandhill Crane fed on angleworms all day as soils were turned over in flower garden plat at home. These worms were taken without hesitation or critical inspection. Toward the end of day it would refuse night crawler but would still take the smaller angle worms. Refused Centipeds. Have observed that when the bird is left in open cage out side that it will commences its calling at about day break when it calls in a most vigorous manner, generally offering a continuous series of calls in rapid succession with the last ones being farther apart! These calls are repeated every 2 or 3 seconds for about 40 seconds. This method of calling is not offered in side of its garage housing. One of the reactors to recreate these calls is the car as it leaves the house or when driven into yard. Noticed today that while it did not pay too strict attention to the sea Gulls as they fly above, it did, however, critically and intensicky focused its attention upon an eagle that flew by. Before the arrival of the gulls this spring, had an opportunity to test the keen visibility of the bird eye when it would perceive a mere speck in the air, a speck in the air that would go unnoticed were it not for the bird pointing them out.

4/6/40.

In field this week end Sat. and Sunday. Saturday afternoon at Alpine Canyon and Sunday at Tuckville in the traverse range at the extreme north end of Cedar Valley. The objective of the Alpine trip was for the Clarks Crow while the Tuckville trip was made in pursual of the Pinyon and Woodhouse Jays. Left Provo after dinner and arrived at mouth of Bakelder Canyon at Alpine. This Canyon is located 2 canyons south of the mouth of Alpine Canyon or the large canyon that heads on the south side of Thermometer or Sleigh runner peak. In passing through the town of Alpine could not but help feel that its setting and climate is the most picturesque and desirable of any community in Utah Valley, snow covered granite peaks to the north and rugged and timbered heights to the east. Due to the western trend of this granite mt. one is literally hemmed in among towering peaks on 3/5 of the horizon. The other 2/5ths is an contrast of scenery with the distant Utah valley & lake framing the horizon. Such an attractive setting is inducive to a development of an appreciation for the great out-of-door and in such an environment it is not unusual that we find one of the contributing scientists in ornithalogy. Not a scientist in the true sence of the word but a man who has offered more information concerning the nesting habits of the Clarks Crow, than a good many true scientists. Such a man was William Dunston, a native of Alpine who died only

in recent years. It was he who had explored Boulder Canyon years ago and had found and disclosed to others the nesting areas and records of the Clark Crow. Such men as Tregonza have camped & travel among the hills with him. Our trip today was into the area where years ago these men had taken the eggs of the crow. The reports are, as given by the son of Mr. Dunstan, that 9 sets of eggs had been taken in immediate areas of Boulder Canyon, coming from both the north and south side of the canyon proper and about the level of marked seasonal level of mountain and above. One particular record came from the juniper covered flat on south side of canyon as pointed out by Mr. Dunstans son. Other nests were visited above the flat on south slope among the conifer. while another definite record placed on north side high on ridge as observed from Alpine Community. From these placements and information as disclosed to Dad during the course of conversat. one would say that these birds are liable to nest most any where along the range at heights of from. 7,000 to 9,500 feet altitude. The Canadian Zone is poorly represent on the west exposure with the uppermost transition merging into the Hudsonian. If such a condition exists would say that probably the zone is uppermost transition in ad zone occupying the logical Canadian zone. Lower Canadian would more likely fit the zone. With this information and with three trip into this same area made in previous years we started forth from the mouth of Boulder canyon about 2:oclock. Passed the shack were Dunston and Tregonza were supposed to have slept on one of their Clark Crow trips. From the mouth proper we gained the north sidehill and ascended up the cliff ridges near the valley border. Our objective was to gain the upper levels and then inspect heads of all the canyons of this north side of Boulder Canyon. To do this one must first get high enough and just under ridge for if one fails to first gain altitude on the valley bordering ridge he is soon ledges and hindered from gaining altitude by a perpet- ous and barrier cliff that dominates the canyon wall. From below one can clearly see these series of cliffs that control the expression of the canyon wall and if one must first get above them before he is able to continue to the east. to in- spect the upper heads of the many draws where the crows are supposed to nest. A geological picture will present the area better than mere discription. The Boulder canyon has a east- west trend and cuts a deep canyon through the Wasatch Front

exposing the structure and features of the rough topography.
One finds in this canyon cut that the strata are dipping abruptly
to the north. Axis of the anticline is N.5 with beds dipping more
to the west near the front than the east. Rock range from
Opher shale in bottom of canyon to mississippian above. The
un differentiated dolomite are not as bold cliff formers as the
mississippian rock. Syringopore common in rocks of upper
ledges. The canyon wall on the north side is dominated by
facing cliffs in which recessed canyons have penetrated and
near their heads the shelters massions offered many protected
and hidden niches of Abies concolor, Junipers, Canyon pine, mobog-
any etc. It is above the face cliffs in these recessed canyons
just below the east west trending ridge that we expect to find the
Clarks Crow. As one passes from the dense oak and maple canyon
bottom up the north hillside he is impressed with the successive
zones of larger type of vegetation. These zones are maple oak,
Juniperus utahensis, Cercocarpus ledifolius - Juniperus utahensis,
Juniperus utahensis + Juniperus scopulorum - Cercocarpus ledifolius -
Arcocarpus montana + Pinus monophyllus - Abies concolor, and
then purer stands of Abies concolor and finally Pseudotsuga taksfolia
We expect to find them in the integrated zone of the purer
stands of Abies concolor and the abies concolor - Pinus monophyllus +
Cercocarpus montana and ledifolias - Juniperus utahensis + scopulorum
zone. The snow line on this particular trip was at the lower
limits of the more pure stands of Abies concolor & Pseudotsuga on the
north side of canyon. On the south side the snows penetrated into
the floor of the canyon. In general the snow line was at the
highest crossonal plane. On our ridge the snow was solid
from top of Thermometer mountain down this east west trending
ridge to the abrupt front which jumps directly down into the
Alpine valley, that is the snow was on the ridge and its north
slopes while the south slopes were bare except in some protected
area. However the soils were damp and snow could not have
left them so long ago. We followed up this redge just under
brink and above perpendicular facing cliff to the next canyon
before visability of upper left hand of Boulder comes into view, all
in a most likely place for the crow. Because of the exposure
of these canyon heads and because of the inhospitable nature of
the terrain to either man or his herds, the country takes on
a most interesting and undisturbed appearance. The tree growth

is aggregated with dead trees lying as they drop. The exceptionally dense and impenetrable nature of the Cercocarpus ledefolius and its many dead entanglements lend permitiveness to these secluded niches. Evedence of old burned Jumpers but no indecation of a general burn. Some Jumpers three fet in diameter. The Abies Concolar are tonguing down into the area in the protected canyon gullies where they enjoy greater humidity, more moisture & protection from the wind as contrasted with the more open positions upon the ledges. While the traveling is deffecult and impassible at points it is most enjoyable to work in and out among these forests of these coarser evergreens. One finds that the deer use this area very consistently as deer pellets were found in almost every conceivable place, however, there is no effect of overgrazing. Such a place may be used more from retreat and protection than for forage grounds as the surface is mainly rocky and ledged nature. As one enters the Abis concolor & Pseudotsuga Zone one finds considerable more grasses & low growing shrubs & herbs. Our journey thru this area disclosed neither ~~birds~~ Clarks crow, their nests or any signs of them, however every thing else was in their favor for a nesting area. An interesting observation made was the occurrence of three large tree that had recently fallen due to a supersaturated condition of the soils and its consequent lessening power of holding the roots of these trees in a firm foundation. The soils are very superfical on this steep slope and not much opportunety for attachment. & would suppose that this years moisture in soils was in excess as evidenced from these trees. Two were large Pinus monophylla and the other an Abies concolor. It would appear that the local condition was more favorable for the Junipers than the Pine. Saving only the afternoon we field had to return with assurance of enough light to see ourselves at mouth of canyon before dark. Arrived at our station shortly after sundown we camp at mouth of canyon.

Birds and animals observed: As we entered Alpine observed an eagle flying from Boulder to mouth of Alpine Canyon where it circled around near its old nesting site above the Power plant on cliffs on east side of canyon. At mouth of Boulder canyon met 3 redtails, 2 normal & one dark phase. These hawks were making considerable fuss and noise as they circled & flew about. It appeared that their was one coactee and 2 coactors. Could see how important circling soaring was if controlled in such a manner as used by the coactee. If planned just right it is very diffcult for the coactor to actually contact coactee in circling a state of discordance. These hawks appeared

400406-39

to favor the south side of they canyon. One → citellus v. utah ray up north side hill among rocks. Heard four red-shafted flickers calling from canyon floor & main valley. One high on ridge. One Townsend Solitaire perched on juniper on high ridge. 19 mule deer 3 on north side hill & 13 on south side hill. The two on north side hill left and after tarry & throughly satisfying themselves left to front of range & then north. One followed east on terraces below high cliff. The deer on south canyon wall were just above the mining operations. They appeared at sundown and commenced to feed in groupings of 9-3 and 2. The fresh trail on side hill leading out of canyon indicated that either it was used as a trail to water or they had passed from the north side to south side since the rains of the last few days. One deer was jumped in oaks in canyon alluvial plane with barrier to south escape and our presence to the north. We left it in the oaks. A deep erosional gully through the flood fan and canyon bottom makes it difficult or if not impossible for deer migration from one side to the other at this point. Nine deer antler were found of both this years and last years. The ones of last years were white while those of this years were like normal live ones. Deer in moderate health not excessively thin nor as fat as fall deer. In general deer are low in mountains although deer trails observed above highest erosional level.

One red naped sapsucker feeding in Juniper & Acnus monophylla with brilliant plumage. Associated with it were 4 chickadees (Mt.). Five other chickadees observed during trip. These bird were feeding among the juniper. A pair of falcon in high cliffs near turn of canyon at forks. One bird present and calling in canyon as it circled and flew about. One of its favorite perches was on a walled juniper over edge of perpendicular cliff. It was observed to have lit in top of other trees but near its supposedly nesting cliff. Only one bird inverdence. One ducky grouse on west side of main ridge. It flew up & over into snow clad north slopes. Several pine siskens flew over ridge & calling, sit in all. 2 canyon wren at distant points. A few other small bird calls which were unidentifiable. As we arrived at our station were met with the familiar call of the Spurred Towhee, Robin & Woodhouse jay of the oak flats & Soon had supper on and enjoyed the view of range with its constantly changes color schemes and intensities upon the high snow covered ridges & peaks. From our camp here had an exceptionally fine opportunity to interpret some of the erosional features of this section of the

range. A 400406-40 deductions made are as follows: There
→ few of the ← is recognizable 3 erasional platforms above the glacial
deposits at the mouth of Alpine Canyon. The upper erasional
remenant is well exposed upon the south side of the granite range
and is extendable to the west and up into the Alpine Canyon
proper. This heegth carries throughout the valley. When one
is on the mountain north of Boulder he arrives at a point where
this level is tied in with all the rest of the level at this same
heighth. All the high peaks of the traverse ranges and the erosional
mountains to the southwest show a common level. This level is the
highest one on our mountains above which the ranges take on
a more old age appearance. Below this upper level is found
a more regular and definite erosional levels. These levels are
best shown just north & west of Alpine canyon, dipping to the
south as they radiate from the canyon. While these are not
level they do, however, indicate a stage in the upcanyon or
backward erosion of the Alpine canyon. This condition is duplicated at the
mouths of other large canyons 1 were the erasional terraces diverge high
and then slope down the valley front exposures. These come down
in regular order. Noted two very conspicuous terminial moraines
of the glacier that issued from Alpine Canyon. These are found
at very mouth. Others may show regularity and a cyclic signif-
icance. This area is in need of a critical study of both the
erosional levels and the glacial deposits. One interesting and
recent fault runs from the mouth of Boulder to mouth of Alpine
trending to the west as it approaches the canyon proper. This fault
is concerned with the alluvium and the surfaces are still free of
vegetation in the main. Such a fault appears to have been
initiated by subsiding of alluvial accumulations. Creek channels
are deeply intrenched in these deposits beyond the mountain range.
Leaving these area for more critical study retired at our camp here
in the oaks.

4/7/40

next morning at same station as above. While getting breakfast
recorded the numerous songs of the Spurred Towhee, Woodhouse
jay (3 birds). The robin, magpie, junco were also present and call-
ing. Examined a magpie nest in creek bottom of riverthawbon,
birch, willow. It construction was frail but inner cup of mud
completed. As times goes on other material will be added to bring
it up to normal shape. Ground littered with sticks. One bird at
nest, other near and as I approached the guard warned nesting
bird by flying directly over nest a giving a sharp call.

The early morning lights upon the granite peaks 400407-41 (snow covered) make a most impressive but cool picture. After breakfast left for Pickville at north end of Cedar valley in the traverse range. Arrived via of clay pit, hence west up canyon to divide, hence west to main canyon leading from cedar valley north & hence up this canyon to last pumper groves where water is found in canyon & government tanks are constructed. From this point we examined the groves on both the west and east side of the canyon. These grove are rather extensive and dominating wherever found. In their more typical number no other types of vegetation thrives except the pumper. However on their peripheral edges the grasses, Cowania, artemesia etc are found to be invading. Other isolated pumpers appear to be out of place among the more typical coverings of oak, Cowania, Artemesia etc. The picture 1-4-7-40 was taken from the east side of canyon

1-4-7-40

and shows the experimental area examined this morning. The picture shows the extent and aggregation of these pumpers. Beyond are the Oquirrh range peaks of West Canyon & Butterfield Canyon. Not the manner in which these traverse hills gradually slope up to the tops or, upper erosional plane of the Oquirrhs. One main erosional plane is found in this drainage and represents the level of the bench tops. The individual pumper trees presented every degree of shape & form imaginable from a low broad loosely shaped tree to a high towering narrow & densely foliated form. I imagined that I could pick out constant types. Tree growing in more or less exposed positions or alone are densely foliated and impenetrable to vision while those in group of trees were generally more loosely arranged Several tri diseased and, leaner bunched. None of these tree carried the old age appearance. No pinyon in evidence. no pinyon jay activity no did we find any evidence of nesting or old nest. Examed three areas of these typical pumper growths and recorded the relative frequency of each species of bird or animal observed. The first research area A-4-7-40 was located as on picture 1-4-7-40. The second research area B-4-7-40 established on the east side of the canyon directly opposite the first research area. The last area was located at mouth of this main canyon on last ridge and some 7 or 8 blocks to the east. One can drive car to pass on ridge where he can look directly down into Cedar valley. During the investigation of these areas listed the percent frequency

400407-42

of the bird and animal forms:

	Research area A 2 hrs in field Skys clear, cool. A.M.	Research B 1 hour 1/2 in field. P.M from 12:30 to 2:00 During eclipse of the sun.	Research C 3/4 hour in field in afternoon. Clouded and overcast.
Spurred Towhee	1		
Raven	1		
Bushtit	5	4	2
Woodhouse Jay	3		
Cal. townsendii mollis			6
Juncos	2		4
Titmouse	3		
G. H. Owl	1		1
Robin	1		
Mt. Chickadee	5		2
G. T. Towhee	3		
Jack rabbit		1	
T. Solitaire		1	
Cottontail			
Meadowlark			1
Erithizon			3
Ferrugenous R. Leg			1
			1

Examined a nest and 2 fresh eggs of the G. H. Owl on south side of ridge near research area C- 4-7-40. Nest in juniper 10' high and constructed as usual. Bird facing N.W. and left upon being approach. Flew N.W and soon out of site around corner of ridge. Flew low on hillside. Ferrugenous flew about 1 block away. Eutamias (probably M. canus.) on main canyon below government spring. On return near clay beds noted an interesting Bonneville terrace face on ridge to south. Could be studied later. Noted Mississippian bed dip east to perpendicular east of Tuckville and north to nearly perpendicular at clay-beds. Quite a jumbled up mess. Erosional remenents of lake mt. appear to carry across to Traverse range. Continued to Lehi & hence to Provo arriving in the evening. Sandhills were supposed to have been in field at Lehi but did not notice them on road to Cedar Valley. Have no record today of any Canyon jays in Tuckville. Mr. Hutchings was visiting eagle nest in Graham pass at south extension of Lake Mountain.

4-10-40

Western Chipping sparrows and several Knights in evidence in Provo.

4-11-40

Lynn Hayward reports the Citellus armatus active at aspen grove. He examined a nest of the citellus placed superficial with hole leading to surface directly below. Abandon channel some 20' long. Nesting material highly impregnated with its parasites.

4-13-40 400413-43

Group of cedar shapening resting in popular in Provo City.

4-13-40

Second bio-ecology aspection trip of the Provo River Floodplane located on the Provo Brick & Tile Co N.W. from University. (see notes of date 3-30-40). Followed same proceedure as indicated on last trip.

	Bird census 600'x150' by foure observers in group C. Temp 59°F Time: 9:25 A.M.						Ground census of 1/10 meter. Time 10:00 - Temp 60° Ground = 46°F			Herb sweeping 48 sweep on each group. Temp = 61°F - 10:50			Shrub sweeping 48 sweep per group Temp - 62°F - 11:10			Tree census of immediate type 11:35 - 63°F combined groups.						General Observations
	A						B			C			D			E						
	C¹	C²	C³	C⁴	B	A	C	B	A	C	B	A	C	B	A	combined						
																Populus 3 mat	Acer 5 mat	Fraxinus 2 mat				
Calif quail	2	6		2	3																	One cannot but help notice the change from a near dormant condition of last visit and the more evident vegetation growth on this date. The general lifeless appearance of last trip has changed to one of life with the leaves and foliage more in evidence. Gunnerunk: leaves & much Squaw bush: yellow flowers but no leaves Boxelder: greatest degree of growth both leaves over one inch long & catkins throughly decorating the tree. Tree form less conspicuous. Service berry in full bloom coon berry. Grass. (four kinds) higher and green with lawn appearance. Since last time both the Solomon & False Seal have sprung up to 8 inches in some cases. Crelaegus tomentosa. leaves 1" Thorn berry. well out Populus fremontii in full bloom Populus angustifolia lifeless except in tops of trees. The & populus come out later than the Ot. Certain areas are further developed than others noticed on one squawbush in opening at 9:35 four mourning cloaks and 2 other smaller species. Most of the birds calling from all directions. No pheasants because one fellow had been there since 6:00 A.M. Fox sparrow preferring the upper debris under trees and berthant grasses. Robins in groups of 4 or 5 & flying about. 18 Pole Goldfinch on top of the cottonwoods 1 mallards on river early this morning. Later about 11:00 heard the Bees in tops of boxelders in greatest numbers.
Robin	2		2	5	3	1																
Flicker	1		2		3																	
C.V. utah	1																					
Fox sparrow		1	2	1		1																
L.T. chickadee				3	6	7																
Sea Gull					2	2																
meadowlark					1	1																
Song sparrow					2	2																
Utah Jay					2																	
Wren	1																					
Cact. m. Conso			1			1																
Elateid larva							14	4	3													
collembola (white)							40		4													
Ephemeridae																						
Centiped							6	5	2													
moth larva							1															
Black ant									3					1				2				
Millped							2															
Diptera									1													
Annelid white									1				3	3	2							
Thipanura							57	1	17													
Arachnid								4	3				15	5	5	10	11	12				
Porcilles								1	1			2										
Oreohelix s.d.							2	18	2													
Ground beetle									1													
Boxelder bug								1		1	5	3	2	7	1	5	1					
Staphilinidae							2	3														
Red mite							2	1														
annelid. (red)							2	1														
black ant							1			1												
white mite							1															
Tenet larva							1															
Diptera larva							1															
nematod							2															
Diptera pupa							4															
cut worm							2															
weevil							1															
Mollusa eggs							4															
Leaf hopper										5	3	3	8		2		3					
Hemiptera																		1				
midges										3	1	3	4	1	1							
mosquito												1										
Misc Diptera										7		5										
Ichneumidae										1	3											
moth											1											
Anthrophoridae											2			1								
gnat											1											
Aphids											1		23		1							
Gall fly											1			2			1					
Chrysometidae											1		5									
Threvidae											1											
tree hopper										1												
Penatomid																1	0	0				
mayflie															1	1						
miridae												1	5	1	2		5					
coccinellidae														1				1				
Geometrid larva																		4				
Elaterid																	14	1				
alecsidae																	2					
nematidae															1							
Bee														1								
melyridae														2								
cympaidae														1								
Spd. bug														1								
muscidae													3									
Sowbly													1									

400413-44 4/13/40

In late afternoon Dad & I drove over to Lehi where we picked up Mr. John Hutchings. He had located the Canyon Jay in Tickville and we were to drive over and photograph a few w the nest. These nest discriptions were taken in canyons lateral to main big gulch canyon and on the east side. The general topography is bench land abruptly terminating at the main canyon. Canyon bisect these bench land. The pinyon-juniper associations are found in bottoms of these canyons, on their sidehills and on the bench. They range from main canyon to base of controlling mountain to the east and ½ way up this mountain. The nests of these bird, Mr Hutchings reports, are found over the entire territory covered by these pinyon-jay. From the nests examined could not say that the birds had any choice in their nest placements as they were found on north & south exposure, bench lands, high on mt & low in canyons, as well as in the canyon bottom proper. From the observations of this evening would say, however, that they preferred, in general, the bottoms of the canyon or low adjacent side hill. Also they did not nest any closer than 2 blocks from the mouth of these lateral canyon, probably due to the fact that the centers of greater concentrations of pinyon and their pinyon food source were higher up the mountain side. Pinus monophyllum numerous on the upper limits of the mountain. In nearly every case the nest was placed in a moderately exposed situation, at any rate by close inspection one could see nest without critically inspecting every branch and section of the tree. They were not in dense, compact trees nor open thinly foliated ones., but as above, in tree about ½ way between the extremes. This would mean then that the trees chosen were not isolated ones as these are generally very dense to to the lack of partial protection of other trees; or in trees in dense patches or groves which are thin and offer no protection. The trees in the canyon bottoms were more or less isolated but the partial protection of the canyon itself helped to keep them from becoming dense and impenetrable. An inspection of the nest orientation will give one an idea as to the relationships.

NO. OF NEST	Above ground	Height of tree	From canybottom	General.
1	4'	8'	canyon bottom	on west side of trunk.
2	6'	12'	canyon bottom	on north side of trunk
3	8'	13'	Canyon bottom	In oaks, (small)
4	6'	8'	on ridge	East side of trunk
5	8'	13'	In canyon bottom	
6	6'	11'	In canyon floor.	30' from other trees
7	7'	9'	In canyon floor.	
8	6'	10	40' up north side hill	
9	5'	10'	40' up north side hill	
10				nest 2 feet from trunk and was only one foot from outer limits of foliage. On S.W side

Dad reports seeing 8 other nests in all situations. 400413-45 had 3 eggs nest no 4 had 4 eggs. Two other sets taken also. nest no 3 ↑ Took picture no 1-4-13-40 from our ridge looking south to mouth of Tickville canyon and distant Cedar valley. The canyon in the distance is known as big wash as it is some 20 or more feet deep in some places. It is rather peculiar that on our last weeks trip we did not see or hear an pinyon jays during our time in the field. This may be due to the fact that it was not as close to the source of pinyon trees. The Woodhouse Jay nest in small dense foliated trees on sidehills & ridges. As we drove down the canyon we found a flock of about 50 pinyons fly S. & toward the pass which was not in direction of our investigations. Mr. Hutching estimates there being about a thousand, or at least hundreds of nesting birds in this area. The birds will remain on nest at 2 feet and even closer but at this time of day will not allow one to part the branches for pictures. after flyeing the alight near and after hopping about will call. Others appear very much concerned and will call from 100' or so from tree to tree or by flying across canyon. The birds this late in the evening certainly disclose their nesting areas and I suppose that one should always find them in proximity of nesting ground. Met Mr. Davis who runs sheep on this range. He says: Have never known the raven to effect a live, healthy sheep or even bother them. Diseased, crippled or young helpless ones may become victim but I have never personally observed this to happen during the many years I have been associated with the sheep industry. He accounts for it (alleged reports of proven depredations) that in certain area there is a group of raven that have developed a liking for the eyes etc. of sheep.. John took about 9 sets of (Sage hen) grouse in last ridge running west and on bank on south side of ridge. Mr. Davis estimates about 18 birds in valley. Feels that this years vegetation is slow to develop. & that one must have feed to juvenate the grounds. The south ends of these desert valleys are always more troublesome than the north ends.

1-4-13-40

4/14/40

Made solitary trip up Grove Creek on west side of Mt. Timpanogos, the general itenerary being up south side of canyon on ridge and return via trail on north side of canyon. The purpose of the

400414-46

trip was to check on the nesting of the Golden eagle which has been under observation the last few years. Dad & mother were driving to Bonntiful and were to pick me up shortly after sundown or dark this evening. Left the mouth of the canyon proper at 11:30 A.M and started the ascent up the canyon bording ridge on the south side of the canyon. At base of mountain saw one Spurred Towhee, magpie nest, several Sceloporus graciosus and two Citellus variegatus utah one in oak and the other about 100 feet up sidehill among the sparse artemesia; a Sceloporus g.g was observed in the creek rocks and trees that allowed me to approach within 11½ feet without signs of fright while those near but on opposed sidehill were very alert and always were near the close propimity of the Artemesia and did not miss the change to quickly hid themselves long before being approached. Ave could frequently hear them but not see them. Made first stop at the north end of the fault bench at 12:35 P.M overlooking the canyon below and on a level opposite the second switchback on trail on the north side of the canyon. The observations made between this point and the mouth of the canyon are: Hillside sleep and covered with artemesia tridenta. no vegetation otherwise except an occasional piece of grass. Surface rocky & bare between individual artemesia. 14 quail flushed on mt side being in groups of 2-2-2-4-4. and regularly arranging themselves up the slope. The groups of 4 were nearer the brink or top of the fault bench. The lower groups flew down to base of slope while those higher flew down a hundred feet or so and then let again. The higher groups were in the base of the cliff rose & Artemisia. but still on steep slope and bat exposure some 40 south of the canyon ridge. 1 cottontail, heard 2 Cut. d. ulahensis(?), Falcon calling in main canyon. Collected a blue racer (1-4-14-40) on side hill among artemesia and bare areas between some 200 feet up from valley and 30' south of canyon ridge: From the north end of this broad fault bench paused a moment before starting south up scarp valley. On this bench at terminal is found a wonderful covering of mohogany (Cercocarpus ledifolius) and Cowania stansburiana. Can still hear the calling of the quail, pheasant, flicker and Spurred Towhee in cultivated field to the west. northern violet green(?) swallow flying in canyon Leaving at 12:50 P.M up valley to south. to gain the second gully to the south from main Grave Canyon. The gully just north of the letter "G" on the mt. From here expect to cross from thes gully to the Grave Canyon edge, which will allow me to inspect the mt side and surprise forms that might be in canyons. Plan on so traversing the entire slope to top of mountain. Before starting up this steep slope observed the Bromelands to be in the domanace with one pair copulating. The Spurred Towhee are found on this flat bench below the G.

As I followed along this flat bench could see 2 deer at point where I expected to start up hillside. and by the time I had worked above them on sidehill between the 1st & 2nd gully from Grove found 4 others lying down in the oak trees where the oaks left the flat & penetrated the lower limits of these gullies. Thru. stones to get them moving so I could get accurate check on numbers. They did not recognized the sound of a rock that might light near them but my intentional movement started them off but for on about 50 where I left them to return to the oaks again. Have observed several Sceloporous & spurred Towhee. The Sceloporous are on the average much larger than those below but just as adept in gaining protection and in a somewhat aqward way. The grasses are more numerous as soon as one gains the hillside above the bench land. Also the deer trail are incondence now and one can always find any grade or direction of trail that he desires. The ground is still damp in many places. Two Turkey Vultures flew by and inspected the country at 1:25 P.M. at 1:30 one vulture flew & circled by. I also observed two hawk about the size of Goshawk with their typical shape flying or rather sailing straight north in a high wind without deviating except to repel the aggressor occasionally. These two birds flew out of sight to the north. They were mere specks as they flew by me so were probably flying sailing rather high. arrived at cliff barrier at 1:40 and had drink in second gully from water seeping over cliffs. No snow on slopes. Above this water & cliff is a nice group of Cercocarpus montana. The jumpers have already appeared & are becoming more numerous. Oaks associated. A marsh hawk & Woodhouse Jay flew by at this level. Sceloporus numerous and large. From here trended toward edge of Grove Canyon. and passed through grove of Acer (Mt. Maple) in first gully. From edge could see a marmot on rock cliff below. From here work up bnd to the south and come out on top at the reservoir. Deer trail, numerous and leading alldalong the way. at the reservior arrived at 2:30 P.M. a Otelles v. utah ran into a file of boards on approach. also a♀ group of ring n. pheasant and a ♂ disappeared into oak cover. Soil damp. Considerable winter gopher activity but no recent spring workings. From the north end of this

reservoir → 400414-48 took two → pictures with the Cercocarpos montana as a frame. Picture (2-4-14-40) showing the upper slopes of

2-4-14-40

3-4-14-40

Trumpanogos showing the extent of snow at this time of year. Picture (3-4-14-40) shows Big Baldy to the S.E. indicating the abruptly dipping beds to the east. While the foreground blocks the lower views of this mountain, noticed that the foreground level is about the lower edge of the present snow line. Stayed here at the reservior until 3:20 P.M., during which time. Inspected the Battlecreek head dramage with the binoculars. Did not see anything moving except and vulture & a spurred Towhee close at hand. From Reservior went north to high point and inspected lower eagle nest. Brown conifer needles in a partially matted condition. One green fir bow in nest structure but nest showed no signs of being built up or occupied. Snow on divide slopes to north. While inspecting this nest at 3:45 4 vulture flew up Grove, or rather soard in descending and ascending circles coming back at one time to inspect me momentarily as I perched on upper redge opposite nesting ledge. (also w. tufted Towhee played here.) From this position one can easily look directly into nest. These four vultures kept close together in formation and as they flew over 2 deer below the deer did not react. This point above the eagle nest supports a beautiful grove of Cercocarpos montana which merges into the Abies concolor on north side. One deer near top in oaks & Mohogany From here continued up ridge to middle eagle nest and found no one home and nest least used of the three nests. The needles were matted & brown and were not adhering to the branches. The upper nest showed signs of being used last year with leaves or needles brown but still adhering to branches and not matted. Kept an eye on any eagle activity the entire day but did not see any signs of them. If an eggle had been

using any of the three nest I would have frightened it off as
I actually hit every nest with a rock; however I am sure
that the nests were not being used as determined by surface
construction and appearance. Arrived at top of ridge
between the drainage of Grove & Battlecreek at 4:30 P.M. &
from this point took a position on the canyon brink
looking directly down into Grove Canyon. Could see
the upper & middle nest and the nesting cliff of the lower nest.
Remained here overlooking the cliffs and conifer slopes
below until 5:50 but did not see any signs of either the
clarks crow or golden eagle. The vultures, however, occasionally
passed by. Also heard the Utah Jay & watched 2 deer
feeding below among the conifers. Falling rocks did not
seem to distract the deers attention from feeding. It
did however react to noise I could not hear. While in-
specting from this vantage point heared the coyotes howling to
the east. One on them called not over a block away. Two
others called together about 2 blocks away. They no doubt observed
my arrival and after a few minutes while I watch from
among a grove of mohagany they burst forth with their yapping.
Watch an Ruby Cr. knight feeding in the tops of this group of
large Cercocarpas montana. It was loath to leave and called
vigarously as I approach. It remained & feeding alertly in tops.
Two dusky grouse flew up from this ridge at different spots but
within 100 ft each other. Sage grouse still common here among rocks
Could hear an occasional thuck of the
the dusky far away. While observing from vantage point a
C.V. Utah ram lay along brink of canyon near me. at 4:25 P.M
a wind cycle hit pleasant grove and sent dust in all directions
radiating in a 1 mile diameter circle. dust blowing on outer
edges of circle only but at a terrific degree & rate. Up until this
time there was a general wind but about 15 minutes after
this occurred the winds subsided entire. It was very unusual
to have dark rain clouds in nearly all directions and have
the winds motionless at this point. One could peer over the
edge of this high canyon brink and fail to find any perceptable
upward movement of the wind. This quiet period prevailed
for about an hour. with black clouds moving N.E at granite
mountain & sun spots appear at S. end of Utah lake. Storm
moving N.E. Left the top at 5:50 and followed down to the
north to head of the Grove Canyon proper. Snow nearly all the way.

400414-50

at first observed both the Shufeldt (?) and Gray headed Juncos feeding together on bare rock ridge on N.W. side of large flat. This ridge is highly aggetated by the gopher winter diggings. Field entirely covered with snow. Certain exposure free of snow. Spring at south side of field entirely surrounded by snow. 2 robins paused to feed & drink at this spring. Also heard dusky grouse, flicker & pine siskins. After pausing here returned to ridge & followed down to trail which eventually leads down to main creek crossover arriving here at 6:20 P.M. Water murky and high. In conifers examined an old jay (?) nest that had been dislodged from an abies concolor. The ledge ridge I followed down ends at the large burnt conifer stump. Springs clear. On trail down observed 3 deer on north side & 5 on south or better on the east side. These deer were just a short distance down from falls but high on sidehill. Trail damp & wet in many places. Arrived at spring crossing trail at 6:50. with good flow of water. As I neared the mouth jumped a cottontail in Covania stansburiana. Arrived at mouth of canyon just before dark and remained in a protected irrigation wash until folks arrived. Weather clear this morning but overcast & cloudy this afternoon with rain in Salt Lake & at Provo later in afternoon.

Creek bottom study of Provo River from Wildwood to Utah Lake..... 4/20/40
(see report followed note of 4/30/40) 4/21/40

Israel Canyon, Utah Co., Lake Mountain. General itinerary. From Provo to Lehi, hence to mouth of Israel canyon by car, hence to head of this canyon and return, hence south along main road to Moseda, hence west to Goshen Pass, hence to moseda again and then south along main road to Elberta. Hence to Goshen, Santaquin, Payson, Sp. Fork. Springville and Provo. Left Provo this morning at 6:00 A.M. and return this evening at 8:30 P.M. Dad, John & Buddy Hutchings and myself made the trip. The objective was to check on an alleged nesting record of the Duck hawk and to investigate eagle nest in Goshen Pass. as well as to make other general observations. Left Lehi and drove to mouth of Israel canyon. Israel canyon is located on the east side of Lake Mt and is the first south canyon that will take one directly to flat top proper of Lake mountain. It is situated about S.W from the prominent outlier near road after leaving the open farmed country to the north. Record the birds observed from Lehi outskirts to here and are: Sparrowhawk III; Magpie 1; Meadowlark 8; Crow 5; Falcon 1; Robin 5; R.W. Blackbird 15; Sage thrasher III; English Sparrow 3; Bluebird 1; Marsh Hawk 3; and horned lark 4. In general Israel canyon can

be described as follows. As east, west 400421-51 with upper limits trending south ultimately gaining the flat main top of Lake mountain. Of the many canyons leading into Lake mountain would say that this one has suffered least from overgrozing. As trip continues will indicate specifically. An interesting observation made as we drove up the long sloped leading to the mouth proper was the successive occurrence of terraces of the old Lake Bonneville characterized by a line of rock cropping and a general increase of grade, some being too abrupt for the car to traverse except on the return trip when we drove down their steep faces. Something should be done with the plotting of these shore lines and their apparent regularity and cyclic nature. Provo and Bonneville levels always conspicuous. Left mouth at 7:30 A.M. Day clear with slight wind. At mouth could hear 3 rock wrens singing, one spurred Towhee, one dead Lepus. ¹ descricata. Jumpers beginning at the Bonneville level, however, two lone one are found far to the east on slopes of ? Bonneville old Lake bed. Following up the canyon bottom proper. 7:42 A.M Rock Wren calling on north side. 7:43 A.M Two Bushtit and few Jeanea. Arrived at first forks at 7:45 A.M. Maples start in just below for the first time. 2 magpies started up canyon from this point. First and only oaks observed being at terminal of the medial ridge. The maple trees are the dominant tree in canyon bottom. From the flat a slight distance up the left hand fork heard 2 singing Towhees (spurred) and 2 rock wrens. At 7:50 arrived at another fork the left leading to the south and its maple lined floor leading up into beautiful slopes of mahoganys. Took right hand fork and at 7:51 saw 1 chipmunk, a dead porcupine and a hummingbird. The hummer was concerned with something as it was diving and calling vigorously. The north side is considerable heavily populated with plant growth than the south side, supporting jumpers, Cowania St., and artemesia with bare rocky areas & soil between. While the south side of canyon is beautifully covered with artemisia a matted appearance of small, dominant mahogany and interspaced with green grasses. The solid mahogany appearance gave off a green grey hue and is most impressive. One is much impressed with the south hillside appearance. As one looks down canyon he finds nice groves of jumpers on both sides of the canyon particularly the north side which supports a entire hillside of jumpers. The areas beneath these north Canyon side jumpers are bare

while those 400421-52 ↓ on the south → side are surrounded and covered by the artemesia and other forbs. Utah lake, Timpanogos & Alpine Canyon lie in the distant horizon to the east. 8:07 Robin flew from maple trees. Maple buds just opening. Cranes melanocarpa and elo berries formed. 1 spurred Towhee. Nice patch of cercocarpes montana on south hillside. Chokecherry coming in very numerous and in patches. 8:10 A.M. 1 bushtit, 2 Towhee, 1 robin. 8:15 A.M 2 spurred towhee one of which was singing while the other was scratching beneath the maple trees. These maples are small but crowded mainly in bottom of gulch proper. From this point we left main canyon and started up ridge leading directly to the prominent cliff near top of ridge to the north. These high cliff and most prominent cliffs in Isreal canyon can be seen from several point in canyon and represent the largest set of cliffs of the canyon. Evidence of fresh deer tracks all along the way. Have left the cool canyon floor and are now going up the ridge to the north. no lizards active as yet which is a most peculiar thing. 8:17 a bushtit in tree and can hear 3 spurred Towhee singing at 8:23 south across canyon. As we gain Jumperous slope observed 5 pinyon jays to fly west directly above us and alight in burnt jumpers on ridge to the west of us. They called vigorously and finally worked up this ridge to top and then back down main east trending ridge. Such tactics suggested that they were probably leading us from their nest areas. This was also true of the two magpies which were flushed near mouth of the canyon and then kept in head of us to the head of the canyon. Good jumpers on our ridge and to the east ridge. Examined a mouse (?) nest placed in top of a jumper tree. Can see 14 pelicans flying high or rather circling high over Utah Lake. 8:28 Rock wren singing. Several bad old fire scares. 8:30 2 Bushtit, 1 Gray headed Junco, 4 rock wrens singing. Phlox flowering. 8:50 1 Bushtit. In the areas of burnt jumpers the grasses have invaded right up to the base of the burnt jumpers indicating that the grasses will grow whenever the foliage of the jumpers are reduced or ilminated. The reaction of the fallen jumper needles apparently have no effect upon the soils beneath the jumper trees as one is led to believe when finding that nothing ever grows beneath the jumpers of a mature stand. A count of the grass here revealed that 150 sq feet supported about 38 individual bunches of grass; a bunch a foot square representing the typical bunch this count was based on bunches and not individual groups of the bunch. 9:00 Examined a rock wren nest placed under a rock on south exposure some 100 feet west of our ridge crest. The rock was movable and measured 2 x 1½' - nest usual and placed 8" back from edge of rock. Chamber much larger than nest & it cavity. Entrance direct and paved with a solid path of small rock about the

of a quarter or a half a dollar. This, path led home to the nest edge. The wren sang at 100 feet. Was flush from this nest. no eggs but nest in perfect condition for nesting. While examining this nest 5 pine siskin flew over and to the north. 9:20 first lizard observed. Surprised at the apparent lack of these lizards in the canyon. arrived at cliffs at 9:25. Found the neotoma present but no nest of either the raven or the falcon. however it appeared as if it had been used by these birds at one time because of the dry stick base of one structure. Carried around top for some time. near the top examined an area 150 square feet and found 20 cedar beetle. (green thorax, reddish brown elytra and hairy). This area was centinuous for some distance and supported just as many beetles as the area checked. The area was grounded with Erodium cicutarium and were no doubt attracting these beetles. These beetles were flying above & resting upon the Erodium. Have observed several Castelega in full bloom, others just developing. Leaving cliff area at 9:30 and flew on visiting cliff outcropping to the west and in other canyon to north. On this ridge above cliffs found several dusting bowls of the rabbit. & Rock wrens calling to the north. Immature grasshoppers. 9:40 jumped cottontail rabbit from artemesia. 9:50 2 spurred Towhee on pass. John reports mt. lion on mountain last week. Government trapper giving chase. 10:05 Prairie falcon & red-tail hawk flew by to the north. 10:10 arrived at small cliffs as observed from the main cliffs (of 9:25). These cliffs are on the north side of the ridge in canyon north of Isreal. but are too small in size to support a large nest such as a raven or a falcon. One large neotoma nest and talus debris below. From this debris picked out two nice Erithizon skulls of a mature age. Below these cliffs one finds a beautiful grove of Arcocarpus montana. Beneath these trees and among them is found solid covering of Pachistama and phlox. Was even difficult to trail a fresh deer trail through it. From here continued west to top of ridge looking down into Cedar valley arriving at 10:20 A.M. Prairie jay nest (old) in juniper 8 feet high in a 10' tree. Continued north a few hundred yards to edge and terminal of ridge and then back. at 10:21 saw one Cut. d. atahensis. Phlox matting the ground in places but no flowers 10:25 W. Crested nuthatch 10:30 arrived at most northern point. Fresh deer tracks. From this vantage point John reconstructed the history of Cedar valley as based upon his own observations and from his fathers diary which discribes the valley. He says that his father first saw Cedar valley as a valley of tall, waving sod

grasses: the → buffalo grass in → north end of valley and the wire grass in the south part of valley. His father harvested grasses for Johnson's army. From this picture of a valley of green grasses it changed to one of overgrazing. This was brought about by the sheep, cattle and horses of the pioneers who developed the area. The crowded and congestion of livestock was necessary because of the depredations of indians outside the confines of this valley. A few artemisia followed and invaded after overgrazing. Then in 1906-07-08-09 the government allowed the people to farm every section of the valley. During this time the entire country was plowed under and an attempt was made at dryfarming. The first two years saw complete failure in this endevor and the farm lands left in this plowed condition. From the top of the mountain we can still see the section lines and fence lines of the 1906 farming. Immediately after this failure the soils began to move in drifting dunes. During this time the wagon roads were made impassable by these drifting sands, making it necessary to rest horses every few hundred feet. In some cases transportation was impossible. The first plant to take abold on the land of moving soils was the tumbleweed which matted and checked the sand movement. This was followed by the artemisia, sarcobatus, cawania etc. Thus the change from a valley of grasses to one of baked soils, wind blown and drifting sands and sagebrush. The south end of cedar valley during the last few years of drought and overgrazing is again moving and blowing sands up hillside on bordering mountain ranges and making bare again the valley floor. From the top of the mountain one can look down upon the valley and see nothing but lifeless and brown expanses. However with the binocular the sage comes into view and large extensive patches of sarcobatus and atriplex come into view. These large area are more or less homogeneous for their species. The present sand dune areas just south of Fairfield were the first to be placed under cultivation. Now one finds nothing but Shadescale, Sarcobatus and tall Artemisia. The Hatchings also say that he new of sarcobatus patches just west and south of the point where Jordan river leaves the lake that have always blew their since he could remember and were at that time twice as high as at present. Before leaving top watched a R. naped Sapsucker feeding on established holes in Juniper tree.

Intellaria, & Sceloporus also on top. The occurrence of the black sage here is interest and quite generally distributed among the artemesia. The color and shape of leaf can be contrasted. In taste the black sage is tolerotable while the tridentata is unbbarable. Tridentata has a large greenish white gall while the black one has a smaller, distorted & smoother gall lacking the profuse hairs of artemesia tridentata. Both sages also have the flower like gall. Left top at 11:20 and followed down east ridge again. 11:30 1 Scelop. gg. 1 Junco 11:40 a Jack rabbit among jumpers on ridge east of the cliffs visited at (9:25) 11:41 Bushtit and Orange tip butterflie. 11:50 Continueing down ridge leading to second forks in canyon. observed Sceloporus gg. 3 bushtit. 4 wren. 12:00 2 rock wren and 1 spurred Towhee. S. gg. 12:10 wall-flower in full-bloom. 12:20 some Mople on ridge. 12:25 R. Wren. Spurred Towhees recorded this morning still singing on south mountain side. 12:30 arrived at second fork where small patch of oak are found. 12:32 2 Bush tit. 12:55 nearing mouth of canyon. Examined 3 magpie nests in Juniperus utahensis. Nest about 150' apart. One tree so dense that one can hardly see into the nest. The sticks on outside of tree first attracted my attention; sticks were were lodge before the nest could be reach. These nests were certainly cleverly concealed in these dense trees. Tree not in main canyon but about 100-200 and 60' from canyon proper and on south side of canyon. 2 rock wren and 2 Sp. Towhee at mouth of canyon. Car at mouth of canyon at 1:05 P.M.

This trip failed to disclosed the nesting site of the alleged duck hawk that was supposed to be nesting in this canyon. The upper main cliff and the cliffs at mouth of canyon and on the right hand side are the only likely looking nesting sites for the duck Hawk. Would like to visit the head of Isreal canyon some day as I suspect the dense Cercocarpus montana forests found their. a few aspen (?) trees are found at the extreme head just before arriving on the flat mountain top. The maple trees are mainly confined to the canyon bottoms as well as the patchy Prunus melanocarpa no water in canyon as far as we could tell. Had dinner here and then left for goshen pass at the south end of Lake mountain. As we left the mouth of Isreal canyon we watch a falcon fly up canyon on south side and also 2 Swainson (?) hawks (Bonneville, one of) feeding on flat at end of lake terraces. They would remain stationary in the air and then gradually dive to ground then return again to their former position, some 40' or 50' above the surface of the ground. drove down to main road over the successive terraces. Birds observed as we drove south to Goshen Pass along main road are: 1 sparrow Hawk, 3 meadow

400421-56

larks, 2 → swanson hawks, → 2 Prairie falcon, 2 R.W. Blackbirds,
1 Sage thrasher, 5 Pelicans, 1 Pituophis C. deserticola, 5 marsh
hawks, and 9 Horned Larks. Arrived at Goshen Pass at 3:15 P.M.
As one approaches the pass he can see a large set of cliff some 4
or 5 blocks to the south. These cliffs stand out a prominent
limestone cliffs in contrast to the lighter volcanic rocks to
the north. In regard to structure it appears like considerable
movement has occurred throughout this region. The mississ-
ippian limestones of lake mountain dip abruptly to the N.E.
while S.W of the pass the volcanic areas show a horizonal re-
pose. Even the vegetation here is different than other areas.
As we worked up the base slope below the cliffs toward the
eagle nest which is placed at the north end of the cliff, ob-
served 3 Amphispiza bilineatus deserticola nervously calling from
among the sage brush. If one throws a stone at them as
they perch on top of the sage the tendency is to drop down to ground
instead of flying away. As we arrived at the eagle nest which
is loosely placed upon a small shelf about 18' from the base
of the cliff and 18' feet from the top of the ledge. This nest is
very conspicuous from the valley below. Nest about 4½ feet high
and 5 feet wide. a massive accumulation of most everything
imaginable including dry sage, paper, large sticks, dry match-
weed, cedar bark, feathers etc. The cup proper was made of cedar
bark, matchweed, straw, pieces of paper, dead grasses, feathers
The cup was protected by overhanging ledge bing 1 foot in from
protected overhanging ledge. One of the interesting things about this nest was
the large quantity of baling used in its construction. An American
magazine was placed at one side of the nest. Another sheet of a
magazine read Colliers- May 30 - 1936. lay at the base of the cliff.
The complete story of this nesting area is as follows. Mr. Hutchings
visited this nest a few weeks ago and found the nesting cup in
perfect shape but no eggs. Subsequent visit indicated that the
nest had been untouched. This would probably mean that
the birds deserted nest and had gone over into Long Canyon where
they were found to have nested and laid one egg. Or the
pair had been separated by the death of one of the birds, or
someone else could have taken the eggs before Johns first
trip to the area. The nest in long canyon on the S.W side of
lake Mt was associated with one falcon & one raven nest
in same ledge. We examined a pile of old sticks at base of
same ledge (Goshen pass nest) ~~to that~~ south of the eagle nest. This pile

of old sticks appeared to be at least two years old and represent the old eagle, nest, structure The excrement was covering the ground to the extent that grass now grow one foot high and more, a green area peculiar to this general area. Under the new nest the surface was normal except for an accumulation of dry sticks that had fallen during the nest construction. This pile of sticks was about 1/6 the volume of nest. A rat nest 10' away at base of cliffs had 1/3 the size of nest, an interesting coaction. Mr. Stitching reports another nest at the south end of these cliffs. Last week two large rattlesnakes were killed above the cliffs One sparrowhawk, 2 rock wrens and one unknown hawk were also observed. The artemesia spinescens (determined by Sid Boyle) were present among the atriplex and low growing types of vegetation. A zone of pebbles cemented with calcium carbonate is found 1/2 way up cliffs. One interesting coral taken from these cliffs. Left Goshen Pass and returned to the abondoned area of Modia thence south. At half way to sand Knolls run out of water in car and was necessary to walk to lake some 2 1/2 miles to the east. On way down saw very few bird there being 3 horned larks. The entire stretch was one of desolation in some area the soils so compact that the western sun reflected from their mirror like surface of baked soils. The entire country is impregnated with indian artifacts and chips. In some areas the surface gulchs have drained certain sections and thereby exposing the substrata. At the lake observed the pelecan, Glue Heron, curlew, Willet, g.w teal, mallard, baldpate, wedgeon, shoveller and pintail. Nice stand of Fragmites communis. Returned to Care and hence south to Elberta, thence to Provo an main highway.

4/29/40

Removed Leichty reports a pair of nesting Goshawks at aspen grove on ridge to the south along the main trail. This nest has been used for many years but probably not continuously. He also reports the clematis in bloom but otherwise foliage of general array of plant not very far advanced.

4/30/40

W. Evening grosbeaks in evidence in Provo City. Yellow Warblers, Catbirds and others have arrived. For the last week we have received an excessive amount of rain with dull cold days and nights

4-27-40 400427-59

Third Aspection trip to Provo River flood plane (see report which is now accumulating at a further date)
(see previous pages for 4-29-40 and 4-30-40)

5/2/40

Western Evening Grosbeaks still in evidence. Great numbers of small birds and warblers migrating through.

5/3/40

Trip to Fish Springs in quest of the sandhill crane. Fish springs is located just south of the Juab-Tooele County line. The purpose of this trip was to photograph and collect a set of Sandhill Crane eggs. Planned to record on route the percent frequency of birds and mammals and to indicate plant distribution in moving west from the Wasatch front. Will indicate time and species or observations as we travel along. These observations will be specific but one can hardly include or receive true picture because as we stop at different point one hears and sees many other things not observable in riding by in a car. However the more evident forms are readily observable. One should really walk to get the truer picture. Left Provo and arrived at Lehi to pick up Mr & Mrs L Buddy Hatch rep and Mat Wilson. Left Lehi at 7:26 A.M and recorded birds seen from Lehi to Jordan river. They

are as follows: 2 English Sparrows, 2 Calif Gull, 2 meadow lark, 1 mourning dove, six mallards, appral 150 Bank Swallows 2 Red-wing blackbirds and 2 brewers blackbird. Arrived at Jordan river at 7:25. 7:26 Phoebe, 7:27 Meadowlark and English Sparrow. 7:28 Mourning dove and English Sparrow. 7:29 Immature Citellus t. mollis about 1/3 adult size. 7:42 one horned lark. 7:42 Arrived at divide of Utah Valley & Cedar valley on

400430-58

Page reserved for river study of April 20, 1940.

main road 400503-60 → 7:46. Citellus mollis → and horn lark. 7:46. Right gulch from Tickville canyon. Grains looking fine. 7:49 Horned lark. 7:50.5 Two horned lark. 7:51 2 horned lark. 7:55 3 horned lark and one meadow lark. 7:59 Cedarfort. as one passes thru this town he finds that on the outskirts the artemesia growing and in passing thru the city he finds Chrysothamnus growing in garden plots and along the fence lines. In passing thru the village recorded 2 Robin, 1 magpie, and 2 English Sparrow. 8:10 Considerable matchweed among artemesia tridentata on flats. Artemesia near Cedarfort overgrozed & small. 8:12 a red tail (?) flying in valley to the west. 1 magpie. 8:19 old town of Manning. Stop at spring for six minutes Have noticed that the canyon east of here is a typical synclinal mountain and the Manning Canyon Mt and valley is made up of perpendicular strata. Left the spring at 8:25. 8:26 among Juniperus, Artemisia, Chrysothamnus, oaks, Cercocarpus montana and other typical shrubs typical of this grouping. 8:40 Divide. down to Mercur. 8:44 Mercur. Stopped.- Started at 8:49. Mercur is last chance to get gasoline. Advisable to have at least 1/2 gal of gas to make trip and at least 5 extra for emergency as well as six or seven gal of fresh H_2O. at mercur heard a Hummingbird. Using cyanid water for their base ore extraction. Tailings going down the Mercur canyon. As one passes down this canyon he is immediately impressed with the occurrence of Ephedra and Pinyon trees which seem to be more numerous than elsewhere. 9:05 west Dip. one rock wren. 9:18 Cit. T. mollis. 9:26 Ferruginous R. leg 9:28 Sparrow hawk. One finds on the east side of rush valley both solid and mixed stands of Artemesia and Atriplex. 9:35 2 small birds (?) 9:36 Horned Lark. 9:44 3 Arkansas kingbirds and 2 robins. 9:45 Raven, one English Sparrow, Crataegus rivularis growing along irregation bank. 9:45 Bluebird, meadowlark, Barn swallow, and one White Crown Sparrow. Have passed through main street of farm houses, (not city) and now at school house at 9:46 AM. 9:47 meadowlark, 9:50 2 brewers blackbird and 2 magpies. 9:51 3 magpies. 9:52 Among a very beautiful grove of Juniper trees. These junipers occurr more abundantly on the west side of Rush valley, and completly covering the low hills adjacent the mountains and in the main above the Bonneville level. Several juniper groves are found on east side of valley but not as extensive.

The west side is mainly artemesia and → 400503-61 Chrysothamnus → which carry right up canyon leading west from. Claser. The Chrysothamnus carry up the canyon floor proper. The popular, Cretaegus rivularis and even aspen trees which were found at 9:57. The aspen-jumper grouping is most out-of place. the aspens being found along the cold stream that gushes down from the Stansbury range to the north. Sparrow hawk. 10: Arrived at C.C.C Camp. Spurred Towhee, Rhesbe, Chipping sparrow and bluebird here. Camp abandoned & being razed. The area favorable situated for collecting station. Leaving here at 10:17. 10:18 bluebird 10:23 Hummer, stopped for a moment to inspect Cliffs, 1 (only) to the S. East. while stopped heard spurred Towhee, rock wrens. Would imagine that these birds and many others are general distributed but of course in riding in a car one can not hear or see many of these birds. 10:25 Divide. From here find that the entire country is populated with young jumper trees. To the S. west from the divide and high on ridge one finds stands of mature and large jumper trees which seem to be moving in from the west side of mountain. Conifers covers the peaks to the south along the onaqui range. 10:27 Devil gape spring just before entering wall Canyon of step limestone cliffs. Stopped here at spring and visited a rock nest placed in a cavity in small cliff on south side of Canyon. Rock wrens calling. Wind persistent and must certainly play a part in plant distribution. Collected here a Sceloporus occidentalis be-seriala in bottom of canyon at spring. Was associated with large rocks and cliffs. Collected with bands. Collection no. (1-5-3-40). Drove down Canyon a short ways and inspected a raven and falcon nest in the largest set of cliff. Raven present only. Left this area at 10:50. 10:51 2 bluebirds, Sceloporus, Atriplex, Chrysothamnus & artemesia in evidence Prunus melanocarpa, Populus angustifolia along Beginning of sands ↑ in Canyon 11:03 2 pinyon jays. One is strikingly impressed ~~by~~ with the unusual large size of the junipers in this area. They are certainly not suffering from poor soil conditions or the wood-mens axe. These large junipers are associated with sands wherever found between here and Orrs ranch vicinity. These junipers are below Bonneville level but are associated with moving sands. 11:13 2 raven. Chryso, Artemesia & Sarcobatus

ent. 10:16 400503-62 Orr's Ranch, a ranch with populars
and a large pond of water originating to the S.W near long
Popular tree. 10:20 Stopped to inspected raven nest in lone Popular
tree at head of spring. Two nest in tree. nest of 3 eggs, 30'
high. Raven was resting in tree on approach. It left and
remained near circling above and calling. after leaving tree
it returned. Started again at 10:45. After driving a few
miles south from raven nest stopped to record (2-5-3-40) an interest-
ing Bonneville shore line exposure which limits the growth
of junipers. If one assumes that
the shore line
represented here
is of Bonneville
age. one can
then postulate the probability of a time factor in the juniper
distribution. Have observed on many trips the correlation
between the Bonneville level and juniper distribution and
in practically all cases these trees are confined above the
level. Those trees below the levels can nearly always be
accounted for by either tonguing along gullies, accidental,
or invasion beyond their early confines via of moving sands.
If such a hypothesis should hold true in a great majority of
cases one could nearly be safe in saying that the juniper and
sagebrush (which is associated with the junipers in its greatest
dominance) is the original climax type of vegetation that
persisted or followed shortly after the ice age and is even
now occupying its former areas. This thought immediately
impresses one with a new conception of the age of the old
extinct Lake Bonneville. Personally I am imbued with the
idea that the lack of penetration and invasion of junipers into
the new environment of this abandoned dry lake bottom is a
matter of time and not soil conditions. as is so well indicated
in the picture. Junipers invade the old lake floor along
the tracts of moving sands and when found associated with
sands are generally larger due to lack of competition, new
soil conditions or drainage. Have record of trees even below
the Stansbury level but in every case they are associated
with moving sands. Getting back to the picture of above.
The artemisia is found to be enjoying its greatest growth
in the zone of junipers directly above the Bonneville shore line.
The artemisia passes beyond the shore line but is soon replaced

2-5-3-40

by the Atriplex. On the shore lines below 400503-63 ↘Bonneville↗ one finds the atriplex on the flat portion & the artemesia on the well drained delta slopes. The jumper tree have invaded beyond the Bonneville level but what few are found are immediately adjacent to the level which indicated that it is not necessarily a soil condition, but the actual presence of moisture. The picture is poor but one can easily see the white line of the wave cut slope, above which one finds a solid black mass of jumpers and below a rare tree or two and these contingent to shore line. If one argues that these tree are governed by soils why is it that they are found above the shore line in every conceivable environment and habitat from gently slopes to precipetious angles from soft soils to cracks in rocks, from low elevations to high elevations etc. The lake floor below level is smooth and barely buccelly by outwashs from mountains which directly above the canyons & gullies enter as:  with hardly a gulch channel upon the lake. floor proper.

A short distance beyond from where the above picture was taken examined a nest of raven place in tall jumper with 3 young, a ferruginous hawk nest with 4 egg placed in jumper and were collected. Found the Crotophylus sculpturing here. as well as several jack rabbits. Started again at 1:10 and continued south over pass and hence west toward another low pass. noted that Atriplex prefers clay while matchweed prefers a more sandy soil. Have left the artemesia at Orrs ranch. Atriplex in the predominance here. Stopped at the divide at 12:15 to inspect the jumper trees to the south for hawks nest as one (a hawk) was observed flying in near vicinity. Old nest observed but not inhabited. Birds no doubt occupying some undiscovered nest. From this divide can see far to the west where large moving sand dunes are tonguing in from the desert. One finds jumper trees associated with this sandy area which is at and below the Stansbury level. Saw one Cit. T. mollis and heard many other calls of the Cistellus which sound much like a small birds call, being very soft & low in volume. Continued down road and trended in a S. west direction among the sands and jumpers that fill the valley. While crossing this valley to divide to the S. west stopped at several points and examined many nests placed in jumpers. Found one red-tail nest, 2 Ferruginous nests, 2 raven nests shortly after leaving divide of 12:15 at 2:00 Stopped to examine a ferruginous rough leg nest placed in

400503-64

top of a jumper 15' high. This nest held 1 egg & one young. A Defodomy on edge of nest. Female left nest and ♂ dropped out of the sky and approached ♀. Nalama nest in among stacks of nest. Could not tell whether inhabited. 2 Jack rabbits left over sands at base of nest. Started 2:16 and counted 8 cetellus in 4 minutes as we drove along. Stopped at 2:19 and counted 4 old nests in 800 feet. one of which was a red tail Hawk placed 18' high in a partly dead jumper ♂ and ♀ present & ♀ called while on nest. 2 young & one egg. Nest held 2 citellus (one headless one & one hind quarters.) Ants in nest. Arrived at divide at 2:32. Raven in air. This divide is at edge of broad valley which is found between this ridge (not indicated on map) and the north end of another range where first government well is located. 2:33 Hawk in air. This south side of this valley ridge has received a long tongue of sand which has blown in from the west along the base of the ridge. Along this sand line is found an association of jumpers. Several nests are observable from the road but we did not have time to inspect. Atriplex leading down from mountain to bottom of slope after which the Sarcobatus enter and carries the vegetation far out into the flat valley stretching to the south. 2:41 arrived at flat portion of valley. Atriplex here both tall and short. Followed across valley and arrived a first government well at 2:55. From here continued around point near base of mountain and not along regular Lincoln highway(!) which follows west & then S.W in flat portion of valley. This other road is more interesting but not as good a road. 3:01 Raven in the air. 3:02 3 Horned Lark together. 3:06. 2 interesting outliers of igneous rock. This range appears to be igneous but stratified as if flowing out over limestones of more recent times. 3:24 Body of H2O with Sarcobatus enjoying the wet situation. Soil cracked outside this area. Whenever one stops he can hear many calls of the Citellus t. mollis, so no doubt they are quite generally distributed. Small sand dune area with Sarcobatus favoring the dunes and Atriplex the flat lying portions. 3:46 Raven. 8:46 Ferruginous rough leg flying. Baked soils and Sarcobatus. In crossing this valley we trended west and intercepted the S.W trending Lincoln road and instead of following it we continued west to Granite mountain of the Dugway range which was of course an unwise gesture because we later had to retrack to this highway (Lincoln) again at the point of our interception. However we had an interesting visit to this mountain of granite, gneiss & schist. 3:57 Grasshopper & Horned Lark. 3:59 Horned Lark. 4:04 Grasshopper. 4:15 Hawk. 4:25 Lark sparrow. 4:30 2 Lark Sparrows. At 4:31 we arrived at the north end of Dugway mountain. In this area one

Sarcobatus, Atriplex, artemesia spinascens → and many others → which I was unable to identify. no artemesia tridentata at this level at least. 4:55 Mourning dove and 2 shrike. Return to point where we left Lincoln highway at 6:00 and then continued south along main Lincoln highway which is of course a poor excuse for a highway. However the sign markers are still in existence. 6:15 N. end of Dugway mt. just beyond the Ind Government well. 6:30 2 horned lark. 6:35 Falcon. 6:40 Raven. Failed to keep accurate record for remained of trip because of darkness setting in an interuptions along the way. Arrived at Fish Spring after dark and camped at the Fish Spring Fur Farm. Not unbolted at the time. Prepared supper and then to bed.

Station 1. Fish Springs. 5/4/40

up before sun on marshe. Sandhill called a few times S. E. of cabin at 5:10 A.M just 25 minutes before sun struck the marshes. This early morning calling proved to originated at about the area where crane nest was later discovered. Only one birds seemed to participate in the calling. Had breakfast and left the ranch at 6:30 A.M with the intention of recording by hour and half hour periods of time. Whenever recording in marsh area one cannot but help duplicate the more verdent forms which continually move about such as the marsh hawks etc. Our plan was to systematically cover as much of the area as possible in the west and south end of marsh. One soon realizes the hopelessness of systematically covering the entire marsh land when only one pair of birds are to be found in the area. If however the search is selective one can cover the more favorable areas in one day. A general consideration of the area discloses the following. From the east side of Fish Spring mountains at our particular section one finds a series of large springs issuing at the beginning of the flat areas of the valley which are found at the distal edge of the outwash talus slopes of the mountains. These large springs trend to the east and are soon dissapated. The first zone then is deep creeks with vegetation closely bordering the stream. Next one finds the zone of shallow waters where main spring water has left the main channels and are flowing through a ramification of small channels which have reflowed the large main stream. These smaller channels soon end and ephemeral pond continue. These ephemeral ponds support ~~ooo~~ a dry dead appearing scirpus while the ramifying channels support green scirpus. In general then the areas nearer the spring heads are green while those of the distant ponds are dry. It is between the first & second zone where nest of sandhill crane was located.

400504-66

The most impressive sete of the area was the undesturbed nature of the creeks which originated in one spot and then flowed east until they lost themselves. The naturalness of the entire marsh land and these springs and creek is no doubt due to the trespass laws of the Fish Spring Fur Farm which now controls the area. No livestock or sheep trails penetrate the marsh land. The creeks again remind one of a large aquarium with the waters as clear a glass and schools of fish swimming among the vegetation and depths. On the bends of the spring coarse the water is deep and without much vegetation while the straight sections are shallower and generally crowded with Potomogeton fluctuatus, Ruppia, and a ~~to~~ armored and horned type of water plants which is hard somewhat ridge to the touch. It is green in color and completely chokes the creek. Generally one side or other of the creek is much deeper than the other and when one steps to the edge he can peer down to the clear bottom which is probably 8 feet deep. The edge of bank is undercut and undermined in some places for six or seven feet beyond. If one accidently steps into one of these side hole he is promised a complete submergence. Muskrats no doubt have helped to start these underground passage but they occurr at a depth generally deeper than muskrat probing. Sands and pure aggregations of shells many of them of Bonneville age line the bottom of the creek. The schools of fish are found near the surface and generally in section with bottom of creek not covered with plants. These fish (probably one of the Hychophlox) keep in formation which is made up of all sizes which in turn would indicate that these fish are not cannibalistic among their own species. The Gobona atrata keep to the bottom and under the protection of the undermined portion of creek bottom. When approaching the stream these fish swim out into opening but still keeping to the bottom of the creek bed. The bed is so throughly covered with snail shells and sands that little mud or muck is allowed to collect. The clearness of the water is probably due to the nature of the water itself being rather hard & slightly warm. The vegetation distribution would appear something like this in areal view.

The water plants completly covering the bottom of the creek and in most places forming a solid mass from the lower limits of creek bed to the top of the water. Edges of creek

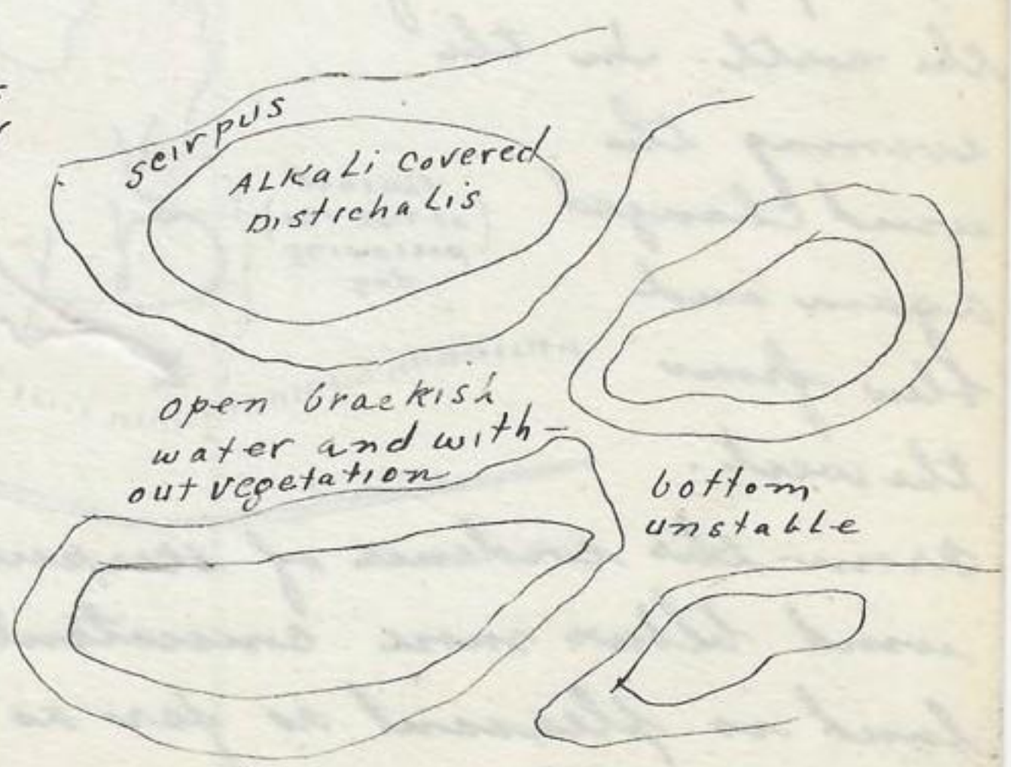
400504-67

lined with scirpus and Typha in an → unscarred condition → coming to the edge of the first slope of the bank and in places even representing the edge of creek. When ever the small ramifying streams leave the main creek they are found to be solid bottomed, narrow, deep and not choked by the scirpus or other type of vegtation. Some of these foot wide coarse penetrate solid stands of scirpus and still keeping their identity without diversion by plants. One can follow up these body wide avenues thru scirpus growth which is impenetrable on either side. I wonder if these passage ways have been kept open by the sand-but find that they are not. I do think however that the muskrats help to keep them open or at least they are the initiators of these passage ways. There is considerable evidence of the muskrat (?) using land trails through the grasses and paralelling the main streams. These small land trails are the only passages in an otherwise natural marsh vegetation as neither horse, cattle or sheep trails are found. In areas away from the immediate proximity of fresh water one finds the soils and grasses heavily covered with alkali creating a snow white surface and looking much like a snow surface. Much of the Distichlis and Salicornia are so covered with alkali that they loose their identity as plants. Much of the coating occurs some 8 or nine inches above the base of the plant. As one tramps thru these marshes he finds that his lips always support a salty taste. Out on the more brackish section of the marsh one finds such:

small water channel thru impenetrable stand of scirpus, keeping its idenity

How often could have hell crane continuous.

CROSS SECTION



AREAL VIEW

The vegetation is dry and dead looking but densely matting the areas around the islands. This area is very extensive and ends beyond green zone near main creek to sand knolls to the east. This area is not likely to be used by the sandhill crane though likely looking on general inspection

Would imagine that the crane would rather nest near fresh water where there is water circulation, food, scurpus and fresh water. These ephemeral ponds are in all stages of advancement from those supporting a few Kelpsomes and occasional minnow to those completely evaporated and bottoms cracked and dry. Certainly a sandhill would prefer a more stable habitat near permanent water courses where they could rear their young with more assurance of getting them something to eat upon their arrival into this world. From indications of the broad flat valleys and the near proximity to the Great American Desert and the relative distance down from the Stansbury shore-line would say that the marsh land was only about 140-150' above the present level of Great Salt Lake. This fact coupled with the realization that the adjacent country to the isolated marsh is somewhat barren: rocky mountains to the west, flat lands sarcobatus + atriplex to the east and south and bordering salt desert lands to the north, makes it a most fascinating area to study. One wonders if the climate has as much to play upon a species as immediately and adaptic conditions. Now back to the trip in marsh itself. As stated above left ranch house at 6:30 A.M. Day clear but wind blowing from the south. During the course of the day the wind changed from its southern trend to an absolute reverse coming in the afternoon shortly after noon from the north. In the evening the wind changed again and blew from the west.

Itinerary of marsh Tramps.

From the evidence of scurpus bending would say that the wind blows more consistently from the south. The marsh land is pleasant as far as temperature and comfort is concerned but as soon as one steps out from its confines immediate on to the [illegible] said mat associated with damp soils and water the temperature is treacherous and traveling is hardships

6:30 to 7:30 — 1 Sandpiper (sp.?), 1 Sparrow (tanny belly, may be a pipit), 12 Green wing teal, 4 Cinnamon teal, 1 am. Coot, 6 mallards, one of which had nest of sm young, 1 black colored rail probably a sora. It flew up directly in front and lit again some 60' away. 2 Bittern, 18 yellowhead blackbirds. 1 marsh wren, 2 meadowlarks, 2 marsh hawks, which were more or less continually in the air, 1 raven flew over marsh low and definetely hunting. While working down large spring coarse a Sandhill Crane left in near proximity of Creek edge or possible on creek edge, and flew south some 1½ blocks and alighted on the south side of a small patch of Fragmites communis. This occurred at 7:20 A.M. It flew up at about 1½ blocks approach.

7:30 to 8:00 — 4 mallard, 8 wren, 1 raven, 3 savannah Sparrows, groups of mosquitos larva in water, Trighochim and Tamarack. The Tamarix few generally as individual growths. 4 in all. The Sandhill flew again at 7:50, an approach and Continued south for about 2½ blocks and lit again.

8:00 — 8:30 — 3 cinnomon teal, sm red-wing blackbirds. 3 yellow headed blacklnds, 3 avocets, 2 bittern, Coyote droppings and tracks in evdence along alkeline soils at edge of ponds, The Sandhill left at 8:10 and flew directly east to alight in ephemeral ponds beyond green growth.

8:30-900 — 2 cinnomon teal and sm redwing blackbirds.

900-10:00 Heard western yellow-throat, 1 bittern, 1 swallow, Rail called, 3 Savannah Sparrows, few ducks in air at different points.

10:00 — 10:30 2 killdeer, 2 shovellers, 4 mallards, & c.w teal, 4 cinnamon teal, 1 curlew. The Sandhill flew south at 10:10 without cause of our approach.

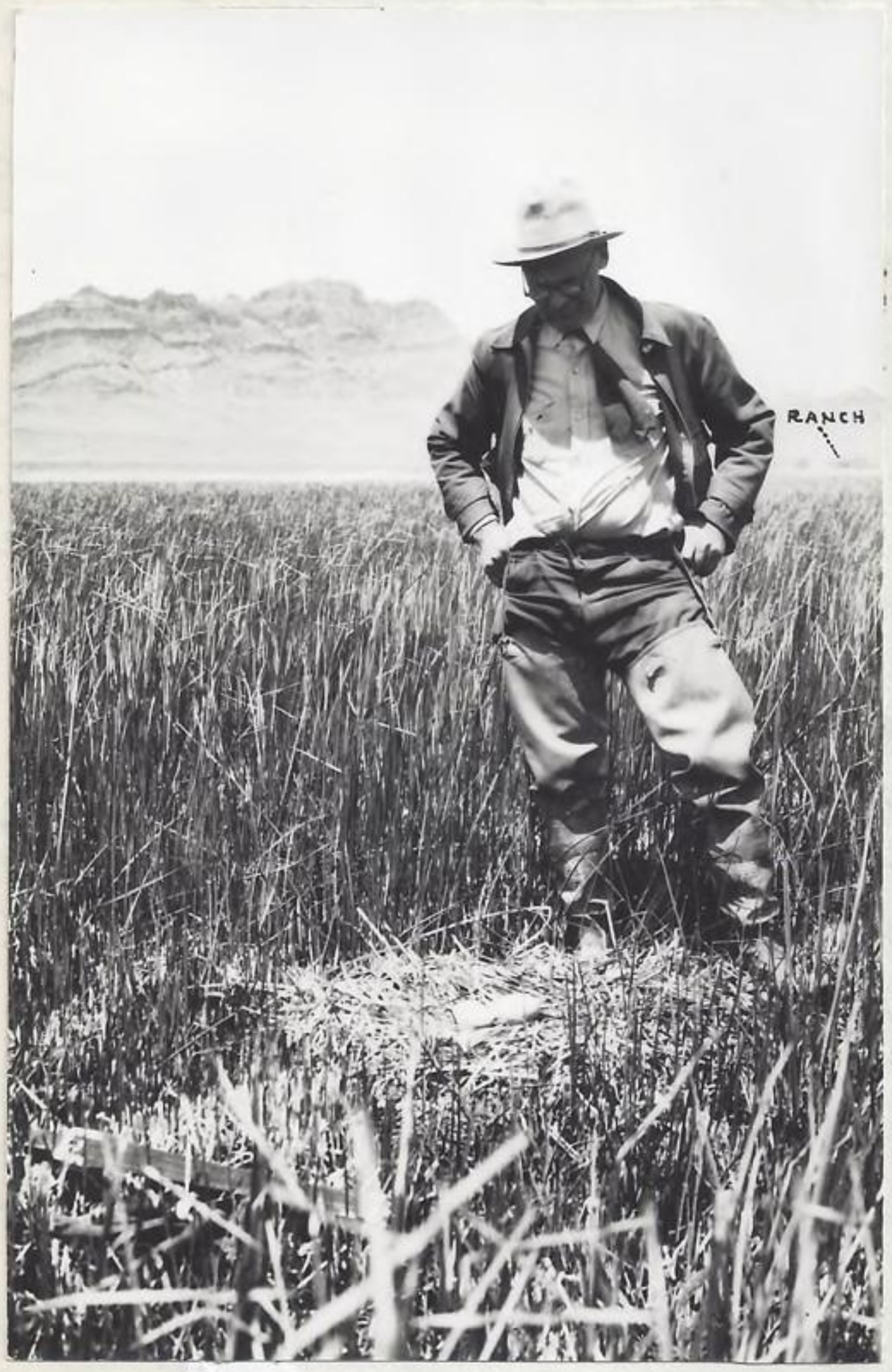
10:30 - 11:00 2 mallards, 1 bittern, 2 shovellers, 2 avocets, 2 killdeer, 2 raven feeding together near Sandhill nest. 1 short-eared owl with 5 eggs. At 10:40 Sandhill flew by coming from the south.

10:00 — 12:00 Mallard nest of 10 eggs. Sandhill flew us at 150' from its spot where it alighted at 10:40 after at 11:05 probably being disturbed by John & Mat who were hunting farther to the south. It flew past with a guttoral call and then N. E for some distance

12:00 to 1:15 Marsh hawks continually in the air. As we were working back to ranch and covering the scirpus patches. While invading a patch of new scirpus growth on fired area stopped momentarily after commenting

400504-70

on the likelyhood of the crane favoring the more permanent and greener area when up popped a long neck and body as the ♀ crane forcefully plunged into the air only 60 feet in front of us. This bird looked more like a whooping crane in size than a sandhill. It left with a call. 10 feet closer revealed the nest and 2 eggs. The ♀ flew south to where the ♂ had landed at 8:10 and remained there while we photographed and examined the nest and eggs. She called occasionally in a single guttoral tone as she picked at the ground or walked over the ground. She walk was not forced for speed but she certainly covered territory in a short period of time, generally in a partial crouch. While standing still it retained a most graceful pose. In general her actoin were nervous and indicated her anxiety over her nest which was in jepardy.



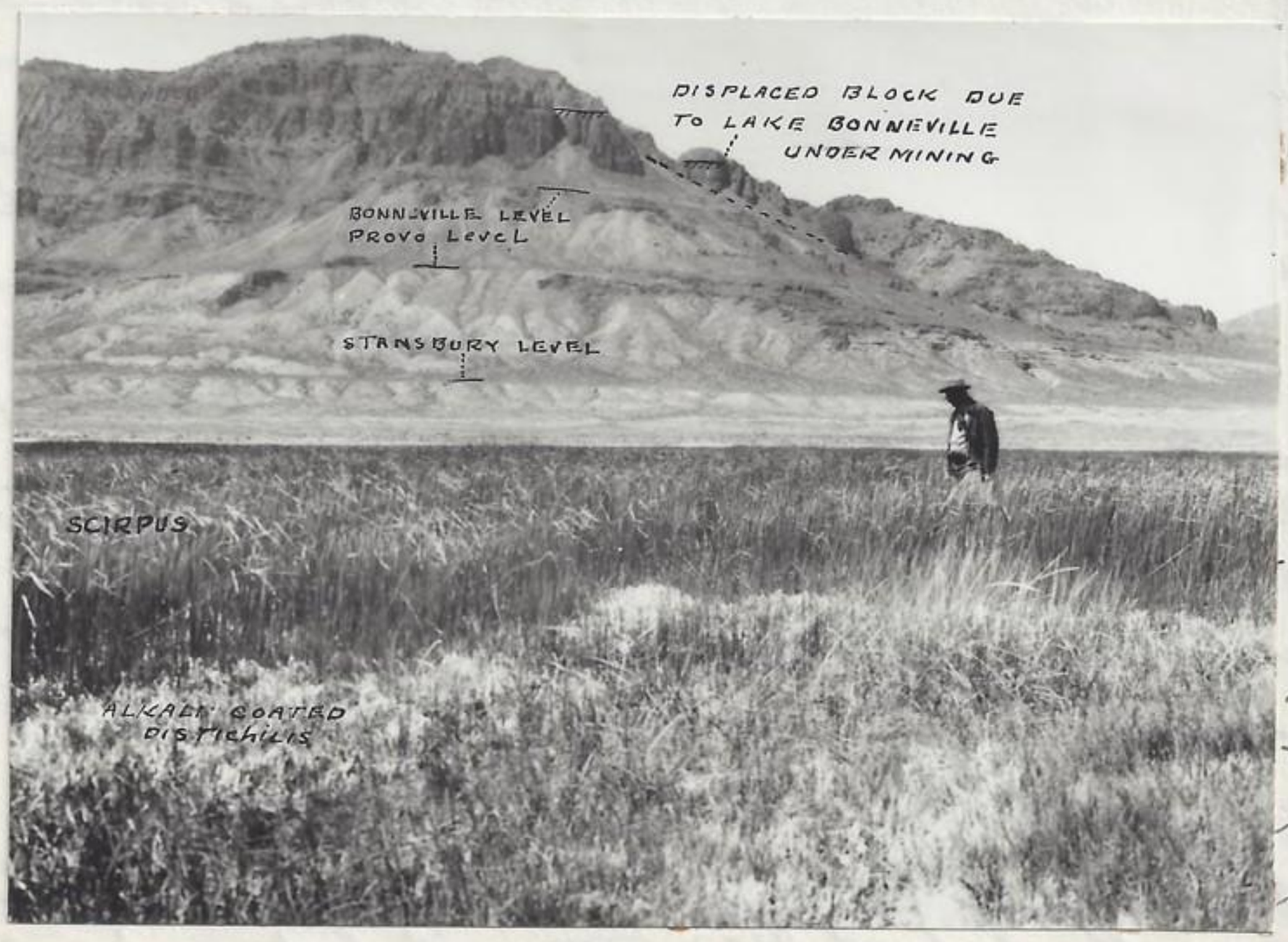
1-5-4-40

Rather than alighting on the other side of the creek out of sight she chose to watch us from the center of a large clearing free from large scirpus or Bragmites. The nesting area chosen was between the two main creeks in an area of moderate growth but all easily passable by foot as compared to the higher & denser growth adjoining creek edge. The scirpus had followed after a fire that burned out the previous stand of scirpus, leaving now a burnt base with new growth of scirpus about 3' high. The dense natural covering of dead scirpus mat had been destroyed leaving only the comparatively sparse solid green stems of the scirpus now as covering.

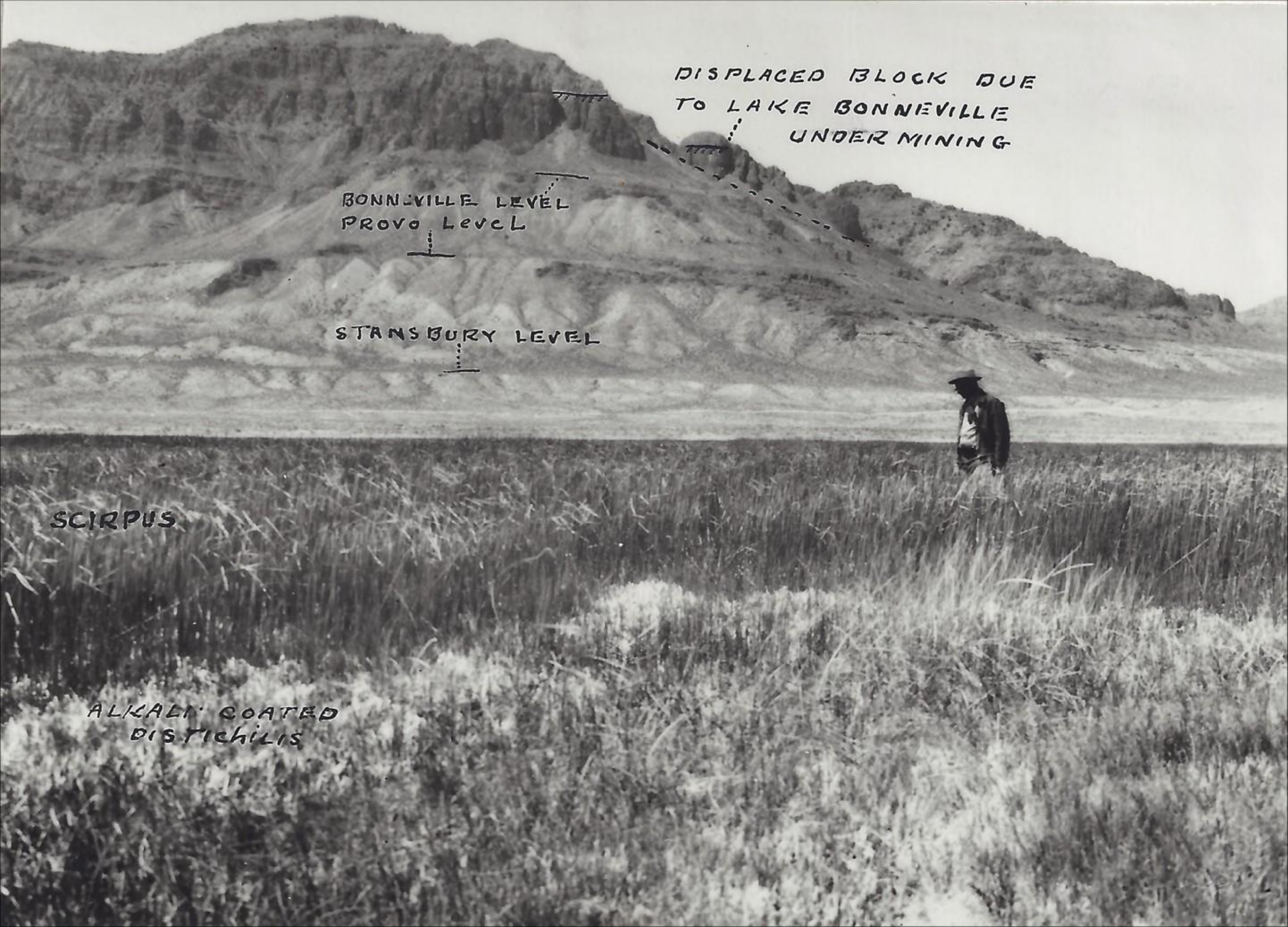
RANCH

400504-71

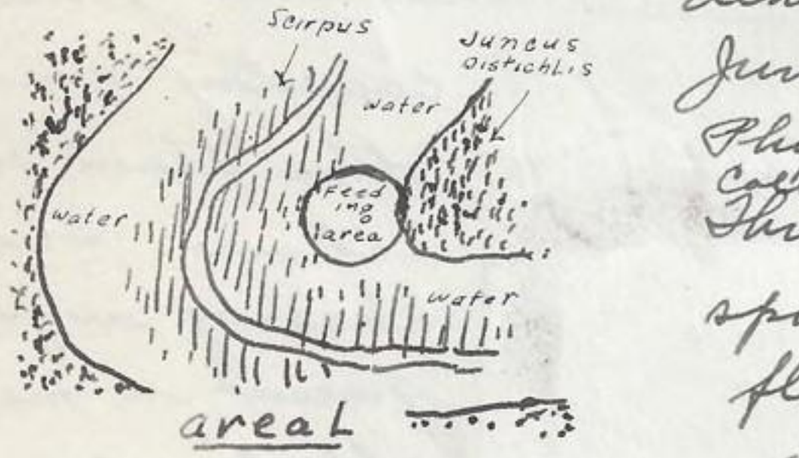
Picture no. (1-5-4-40) indicated the → placement of the nest.
Dad at north edge of nest. The two eggs are in their natural position. nest 2 and 1/2 feet x 2 1/2' and apprat 6" high. The nest does not impress one as being a very elaborate structure but merely an aggregate of scirpus crudely placed. note the surface scirpus place as a mat with a east-west trend. all material of dry scirpus stems. The ground is damp but no standing water. The nest proper placed at the north side of a circular clearing 8 feet wide. This clearing is free of scirpus except the burnt stubs and a few single stems. No evidence of clipping off of stems so would assume that probably the scirpus growth has been retarded by the cranes continually alighting in the circular area, although no trampled condition of the soil existed nor foot marks evident in mud & damp soil. Upper surface of nest dry, base damp with colony of ants Earlier in the day examined an abondoned nest of last year at least a similar set-up with clearing, nest on one side etc. It was placed in a similar vegetation and near the present nest sight. If the circular space is persistent for over a year would almost believe that such clearings are due to accumulative excrement effecting soil & consequent growth. Picture (2-5-4-40) indicate general country and other plant associations. The clearing in foreground is mainly alkaline covered distichlis and soils less damp than scirpus stand beyond. Dad stands at the nest site. The mountains to the west show the three levels of Lake Bonneville and will allow one to return



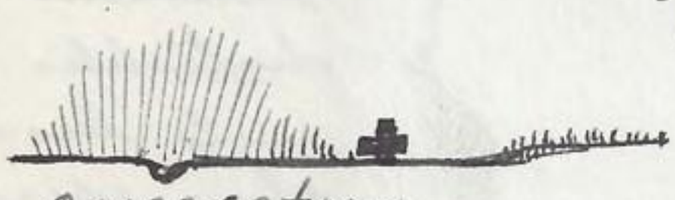
2-5-4-40


DISPLACED BLOCK DUE
TO LAKE BONNEVILLE
UNDER MINING
BONNEVILLE LEVEL
PROVO LEVEL
STANSBURY LEVEL
SCIRPUS
ALKALI COATED
DISTICHILIS

at some subsequent date and relocate nest within a few feet of its original location. Note haw level shore lines are hardly bisected by erosion except delta edges. Mr. Hutchings reports a measurement of a foot imprint being 5 1/8" wide and 4 3/4 long (center toe). Its stride is about 36" or 18" step. Collected eggs and continued north to creek where dad enjoyed a swim and offering me a way across. My cold did not allow for such a pleasure. Sample of mollusces (3-5-4-40) taken in bottom of creek. It appears that the entire bottom is made up of these small snail shells. Water near body temperature. Hence to ranch and dinner, arriving at 1:15 P.M. After dinner examined a Neotoma lepida nest in barn. It was made of juniper bark (?) and cup shaped without protection above other than roof of barn. Neotoma in nest at time of examination. Another nest 2 feet away on floor of manger like the first but covered over top. In the evening as sun was nearing the western horizon we penetrated the marsh again just east of the ranch. The sun left area about 7:00. At 7:02 we flushed a feeding bird in the first patch of green scirpus. It flew south after flying a short way to the north. It was feeding at outer edge of scirpus growing along a small water channel. The open water was tilted and about six inches deep. Small scirpus graded into tall dense scirpus along creek proper. Juncus and distichlis covered island. Physa ampullacea about 25 per sq. yard. Collected spiral (4-5-4-40) live ones. This feeding spot was indeed a secluded spot in the bend of the small fresh & flowing creek. At on the surface of the water were found six established scirpus root bases with the white roots & shoots showing conspicuously. It is highly possible that this bird had pulled them up and was feeding upon the roots or young tender shoot. The tender shoots were tried and found palatable and indeed a choice morsel. at 7:06 watch a Sandhill slowly wing its large body northward and finally alight at designated spot. Could have been same bird as flushed at 7:02 P.M. It lit and called several times and then every thing quiet again.



areal


cross section

A scirpus patch 100' wide and along a small water channel 1 foot wide was so dense that it allowed one to walk upon the top without falling through. One could easily crawl upon the surface in fact it was the only way in which one could cross the scirpus mass. a few green stems extended about 1 foot above the top of the dry mass. The green one being six feet high. The water channel led through the stand and allowed one to walk through along a foot wide avenue. Have wonder what the sandhill naturally nest among when burnt over areas are not present. Could it be upon the tops of these dense scirpus mass? I doubt it. Mac collected a set of 5 marsh hawk ~~eggs~~ found 250' from where sandhill had been feeding. Hawk present and crying directly above the nest. Returned to camp. This evening Mac saw a Poor-will. The Cotidebiana called frequently tonite but nothing like they did last night. Nor did we hear the sandhills call during the night or next morning. This afternoon Mr. Hutching collected a Colubor taenatus taenatus 16" long. This evening drove up to the Big Springs at the north end of Fish Springs mt. On way saw several Cottontail of all sizes (4 altogether). Rowen at spring. Other favorable Nesting area here but not as good as area S. E. of ranch. Found an interesting plant on a scale of the Ephedra but could not identify. Evidence of indian habitation at heads of all the springs. After Causual inspection returned to ranch and retired. Neotoma active all night in attic (so they report.)

Indian Spring (continued.) 5/5/40

Up at sun up. no sandhill activity during nite. While preparing breakfast collected (1-5-5-40) several beetles and crustaceans at head of spring just north of the ranch. Watercress in spring. Water hard & slightly warm. Flock of Cowbird remained near ranch. 1 brewer blackbird (?) among them. This flock was ~~frequently~~ seen. Phoebe nest in barn. Barn swallow ~~& cliff~~ 5 nests in barn. 3 skulls of the badger taken near the ranch. No English Sparrows. Left the ranch at 9:05 A.M for return trip. at the south end of the marsh in freshwater ponds observed 1 canvas back pair of blueuring teal, 4 cinnamon teal, 15 am. Coot and 4 redheads

9:25 Horned 400505-74 East side of valley at edge of mts. 9:40 one of
the n.w points. 10:02 next to the last n.w point before divide
through the dugway range. Stopped here one hour and dad took
a picture of the very well exposed shore lines on this
point. The Bonneville level, and Provo level are prominent
while the Stansbury level is indicate at the base of
the mountain as a white zone. The calcium carbonate
line is found accompanying both the Bonneville and the
Provo level. This has been formed during the period
the lake remained at these levels for extended periods of time. when the waters splashed against the rock and allowed carbon dioxide to become throughly mixed in with the waters thus percepitating the calcium bicarbonate which is soluable in the water, to calcium carbonate which now remains as a zone at these levels. This calcium carbonate dips abruptly toward the water in all cases. One of the pieces of this calcium carbonate found in valley below showed numerous signs of mollusca life. If one were to examined this calcium carbonate of the Bonneville level he could get a true picture of the life during this period. Anything found below this level could be of any age above the level so would not represent the life of the particular level, for example the mollusca shells in fish springs are probably of all ages. While at this point walk up a small gully on the talus flats among atriplex and in 600 feet found 2 Phrynosoma, 14 Cnemidophorus++, 7 Crotophylus wislizini, 16 uta stansburiana s. The Cnemidophorus were generally found in near proximity to Dipodomys mounds. Can run as fast as man. Wild onion, asters(?), and other interesting flowers out. As one left the gently sloping talus to join the broad flat valley expanses he passed from atriplex to Sarcobatus. Wherever sands blew onto the Atriplex slopes the Sarcobatus was sure to follow. Left here and arrived at low divide across Dugway mountain at 11:15. At 11:30. in about center of flat valley east of Granite mountain a Cowbird(?) or a ♀ brewer was observed to be following directly back of car. It followed for 4 1/2 minutes in close persuit, sometimes directly over car. Finally it left and swerved to the south.

2-5-5-40

2-5-5-40


.....Bonneville Level
Provo Level
Stansbury Level

as a test we stopped car and it flew over and continued to fallow the stetching car immediately in head of us. Its manner of gaining speed was to drop down by steps to near surface of ground & then dart up to gain altitude again. What it could be during out in this flat dry, dwarf atriplex valley is a mystery. 11:45 Isolated sand knolls covered with Sarcobatus in an otherwise solid stand of atriplex. Sarcobatus is certainly closely associated with sands. 12:00 Gauer government tanks. Signs with 17 miles to Orrs ranch. From this valley one can see the long tongues of sands blowing in from the N.W along the south sides of the two valley ranges to the N. and N. E. The junipers are confined to this zone of moving sands. We drove across the valley a stopped at the first small range at first sand tongue arriving at 12:18 P.M. made short inspection and found the Cremnodophorus the dominant lizard. Dipodomys present. Citellus called weakly on all sides, Raven nest of five young in nest in 20' high juniper tree. 3 feet plus through at base. The edge of the ant impregnated nest was completely covered with a white layer of excrement. Flies attracted to the nest. One citellus head on edge of nest. Young faced edge of nest and kept mouths open but did not have any intention of leaving the crowded nest. One more young would have been one too many. One of the wings measured 7 3/4" Graded range of size present. Fully feathered & praticaly ready to leave the nest. The adult kept 300 away but called continuously. Two red tails were attacked by ravens as they circled above nest area. Surprised at the numerous neotoma nests at almost every favorable place for a nest, sit in 80'. Excavated one place in tree above ground and found one young 1/2 grown in accupancy. Grasshoppers and bushtit present. Female ruby Cr. Kinglet(?), Cot skull, Badger hole, Citellus frightined from neotoma house at edge of sand dune. It would not leave the peripheral edge of vegetation at being harassed indicating its preference for and dependability upon vegetation cover. Some junipers having superfical root Complelly exposed on dune area. Atriplex ranging from mountain to flat valley then replaced by a pure stand of Sarcobatus. Many interesting desert shrubs and plants on dune area. One with a flaccus & thick shiny leaf with an appearance like atriplex. Juniper trees extra

400505-76

large. Beneath the ravens nest tree found an area that had recieved excreta and pellets which could be raven or owl. Rhynosaura present. Started again at 1:50 and before arriving at Orrs ranch made several stops so did not keep check of time. Investigated again the Ferrugenous nest that was inspect two days ago and which at that time held 1 young & 1 egg. Now it possess 2 young. Ictellus body at nest. Birds overhead & calling. On way to ranch observed more hawks & ravens in air. Arrived at spring at Orrs and after dinner left at 4:15. 9 ravens together on fence posts at ranch. also one falcon flying over premises. A audubon warbler in long popular tree at spring south of the ranch.

On main road east of Orrs Ranch at point where first jumpers are found (3-5-5-40) Dad took picture of the shoreline which seems to be controlling the jumper growth. This picture is so far superior than the one taken with the small camera have include here. See note of this area in first part of report.

3-5-5-40

Car developed distemper for hills and was nessesary to have John tow us up through devils gap. Left them at Glover and travelled north to Tooele to get new distributer points & adjustments. The divide just north of Stockton is made up of a barrier bar of Bonneville age. Arrived at Provo at 11:40 P.M.

5/6/40

Camped overnite at Canyon Glen. River temperature six inches from bank 2 inches deep, rocky cove, flow not in direct current but waters agitated at 9:00 PM = 54° F. At 7:00 next morning same water in same place = 50° F. Waters slightly turbid. Lower in morning by 1 inch. Nite clear & strong down canyon wind. Water ouzel flew up river singing.

5/9/40

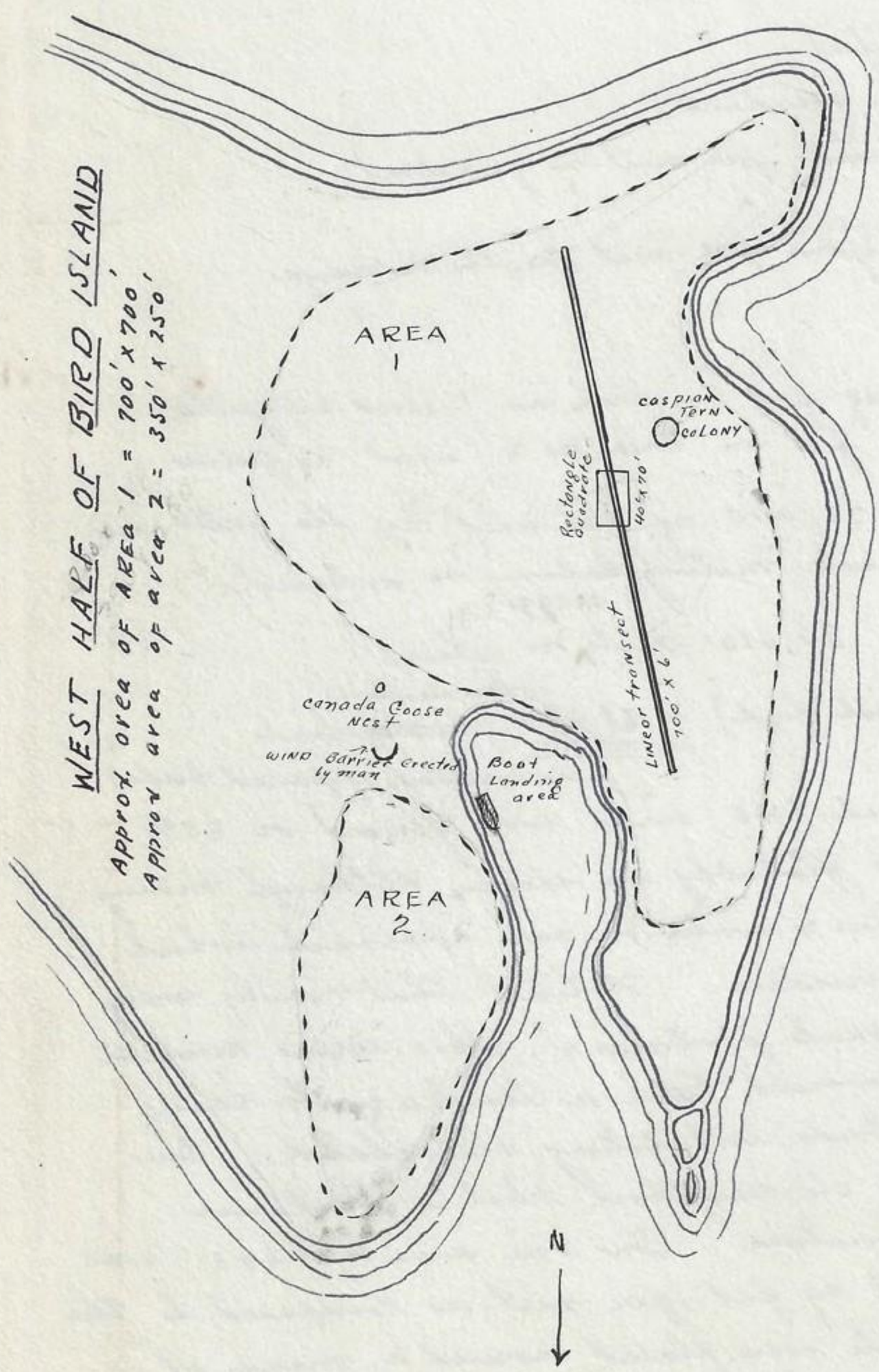
Great migration of warbler today & last few days. Great number of W. Evening Grosbeak in same area from early morning to afternoon at first N. and 3rd east. These grosbeaks remained here in sycamore trees the two following days at all hours of the day.

Rock Island, Ut. Lake. 5/10/40

Beck, Tanner, Haywood, Beddulph and myself spent afternoon on ~~back~~ island in Utah Lake. Left mouth of Provo River at 5:45, Forster tern resting at mouth of river. Water depth short distance out 6½ feet. From then on to island gradually increased in depth to eight feet + just of n. end of island. Rock bottom in north bay 7 feet with 2½ foot of mud. Plankton plentiful. Gulls mainly arriving at island, some swinging & touching water and others flying higher. Day 88° F. Lake surface nearly a mirror. no wind. Several Gulls resting on water and on shore line on approach. On island estimated number of nests and gulls present as based on specific count of 2 quadrates. One 40'x70' quadrat was made in center of a well established and homogeneous surface area, made by staking off and placing a piece of paper on these nests counted so as to eliminate any error of duplication. The second quadrate measured 700' x 6' and extended through a typical area. made by measuring a 700' distance and then with a set foot stick held at the end of a ruler ⊤ passed down the measured distance in a straight line and counted the number of nests that the 6' stick intercepted. The sec

WEST HALF OF BIRD ISLAND

Approx. area of Area 1 = 700' x 700'
Approx area of area 2 = 350' x 250'



of the nests → had to be ↗ 400509-78 intercepted, not merely a partial edge of a nest. Then by estimating the area covered by the entire gull colony calculated the population of the island. The greatest error will of course be in the estimation of the total area used by the gulls; however their congregation was a close aggregate and fell in two general colonies on the west half of the island. The rectangular quadrat revealed the following:

40' x 70' = 2800 sq feet.
162 (number of nests in quadrat)
2800 ÷ 162 = 17.2 sq feet per nest in quadrat.

The linear quadrat revealed:

700' x 6' = 4,200 sq feet
204 = (number of nests in quadrat)
4,200 ÷ 204 = 20.5 sq. feet per nest in quadrat

20.5 + 17.2 ÷ 2 = 18.8 sq feet per nest on the average

700 x 700 = 490,000 sq feet in area no 1. used by gulls
350 x 250 = 87,000 sq feet in area no 2 used by gulls

490,000' + 87,000' = 577,000 sq feet used by the gulls in the entire composite nesting colony on island.

577,000 ÷ 18.8 = 30,686 nests (of eggs) on island

30,686 x 2 (pair of ~~nests~~ birds) = 61,372 ↑ Individuals of paired birds

In one area of 15 nests, 45 birds were found or 33% non-breeders. This is probably an excess although many birds were on shore line & water on our approach which would indicate non-breeders. Noticed that nearly every nest had a female & male protector. This excess number of gulls not nesting would have a tendency to raise the total number of birds inhabiting the island. One nest was 23 inches to its neighbors, that is distance between the eggs themselves. In one area of 3' x 13' was found 9 nests or 4.3 sq feet per nest. as compared to the 18.8 average. These nests were placed around a mass of Salsola pestifer. Killdeer, Canadian Goose, Bufo woodhausii, jack rabbits (and domesticated black), colony of about 30 caspian tern, 1 carmorant, willow, Tamarix, populus angustifolia, rabbit brush present. Saw eggs being eaten in Caspian tern colony when tern not present. 5 dead gulls, seven nests (of gulls) of young & eggs.

Bufo woodhausii unusually abundant in area between the two areas. Some in copulation, most of them on dry land. The Caspian tern colony (14 nests & eggs) was composite but the gulls roped in among them. The Caspian was allowed to nest in nearer proximity to the gulls than the other gulls themselves. Terns would leave first leaving the gulls to mix in among their territories. Tern would return when 10' away. Both gulls & terns aggressive. Tern holds bill wider than the gull. Terns vide a slightly elevated area for nesting grounds although several nests off the plateform.

after sundown and arrived at river after dark. 3/4 way an owl (short eared) followed boat for a few minutes, some distance of land. Gulls returning to island at 8:25 P.M. Lake at approaching twilight a mirror & unusual smooth as expressed by captain of the boat. Late twighlight wind wall approached from north & then N. E shattering the mirror like surface into a thousand piece changing the identical moon reflection to a long beam of moon reflection carrying. Lake mt shoreline.

5/12/40

Birds observed at point where channal intercepts reefin Mud Lake. Class of 20 teacher students made trip. Birds unusually numerous in species and numbers of birds. Those represented are: Mallard, Pintail, Cinnamon teal, Elegans blue heron, B.Cr. Night Heron, Brewster Egret, L.B. Curlew, W. Yard G. Ibis, Double Crested Cormorant, a. yellow throat warbler, Avocet, Killdeer, Am Pelican Marsh hawk, R.W. Blackbird, Yellow headed Blackbird, Pheasant. Am. Coot, Mourning D. Willet, S. Eared Owl, Canadian Goose, Caspian tern, Forster tern, Calf. Gull.

5/14/40

Made second trip with another class of 20. Same place, same time. Marsh relatively dead in contrasting with monday trip of 5/12/40., probably due to interference of Sunday traffic on lake etc. Failed to see the Caspian or Forster tern; otherwise the same except the following birds: Western Grebe, and red. head duck. Stopped at the mouth of Crows River and found the Caspian & Forster Tern, B.N. Skit, Bank Swallow and Snowy Plover, Magpie Robin and Horned Lark.

5/16/40

Made another trip to reef of above and found the numbers of bird as of the 14th. This scarcely would indicate to me that these bird that usually feed here on mondays are here because they are forced off the better feeding ground of that Lake by the Sunday boating and fishing activities. At least it is true that they are found here in great numbers on Monday but not on any other week day. Such would indicate a reaction between man and birds of the lake. An open field at point where the reef is and has been elevated & dry for some time found nest of the Western Willet. About 12 Curlew (not together) on open fields also.

Rock Island, Utah Lake. Dr Beck trapped a few mammals on rock island. He remained on island that night & next day and found that the greatest activity of the gull occurred during the night with a cessation of movement during the hot part of the day. The Canadian Goose had deserted its nest. Eggs had been deserted since beginning as embryos had just begun. His mammals were handed over to me for measurement and they are as follows. and include Peromyscus and Mus.

(1-5-18-40) Peromyscus. m. Son. 162-70-20.5-22grs ♂ testes 8 m.m
(2-5-18-40) Peromyscus m. Son. 160-71-19.5-19grs ♂ testes 7 m m
(3-5-18-40) Peromyscus m. Son. 165-75-20-19grs ♀
(4-5-18-40) Peromyscus m. Son. 163-72-20.1-23grs ♂ testes 7 m.m
(5-5-18-40) Peromyscus m. Son 166-75-20-22grs ♂ testes 8 m.m.
(6-5-18-40) Peromyscus m. Son 147-65-19.5-20grs ♂ testes 7 m.m.
(7-5-18-40) Peromyscus m. Son 162-73-21.4-19grs ♂
(8-5-18-40) Peromyscus m. Son 156-74-20.1-15gr. ♂ testes 3 m.m.
(9-5-18-40) Peromyscus m. Son 160-72-20.2- ♂ testes 7 m.m.
(10-5-18-40) Peromyscus m. Son. 152-71-20 ♀
(11-5-18-40) Mus musculus 175-91-19.5-17grs ♂
(12-5-18-40) Mus musculus 154-78-18-12grs.

North Fork Provo River and
Deer Creek Ridge, Utah Co., Utah
May R, 1940
From east side of mt. Timpanogos
N of Aspen made panoramic
picture of N Fork Provo River and
Deer Creek Ridge. Photo 1-418-40 to
10-5-18-40. Pleistocene erosional
levels are depicted in the photos.

Deer Creek Ridge, Utah Co., Utah
May 19, 1940
Checked Deer Creek Ridge (E of N.
Fork Provo River) as example of
ecotone. Identified Quercus gombeli,
Prunus melanocarpa, Symphoricarpos
rotundifolia, Amelancher almflatea,
Rosa, Acer grandidentata. Bird
are: chipping sparrow, broad-tailed
hummingbird?, mac Gelevray's
warbler, bleuck-headed grosbeak,
orange-crowned warbler, green-tailed
towhee, Hammond flycatcher & hermit
thrush. Photo 1-5-19-40 of Cascade Peak,

Utah Lake, Utah Co., Utah
May 25, 1940
Tri Beta Lake Cruise. Visited Indian
Knolls and Rock Island. At Ind. Knolls
found best petroglyphs on east side
to lake edge, Cremidophorus t.t,
Sceloporus g.g; and Pituophis c.d taken
here. Carp spawning. large ♀ & small ♂

Photo 1-5-25-40 Photo 2-5-25-40

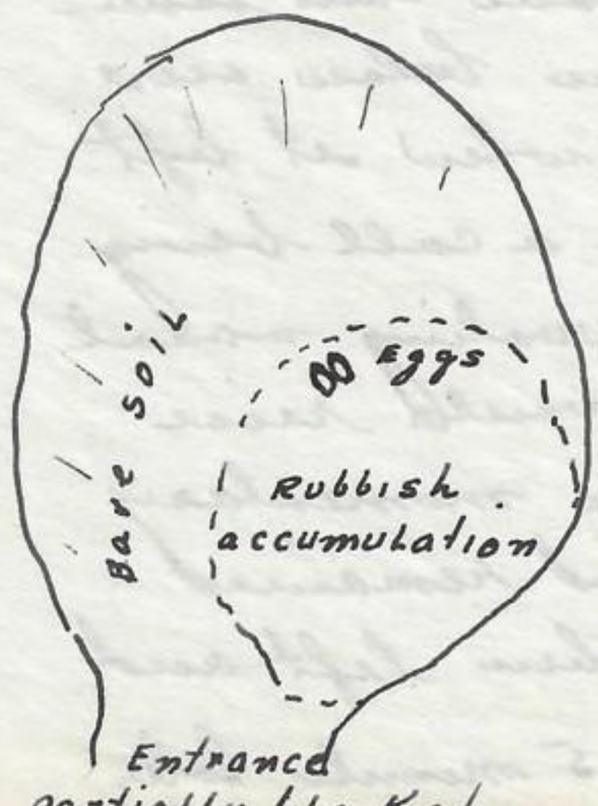

4-5-18-40
5-5-18-40
6-5-18-40
7-5-18-40
8-5-18-40

Two or three factores of the
Island and bird life on
this trip. Gulls small
with many eggs yet to hatch.
The Pelicans, Cormorants
Mallards, Spotted Sandpipes,
Killdeer, Caspian terns
were all in endance. On
three occasions gulls
struck my head with one well placed strike 3.5-25-40 creating a long
furrow in scalp which bled very freely. Such attacks were
experienced only by a few birds and generally in those
areas where the boats regularly landed. Arrived at Provo at 1:30

(note of 5-20-40 follows) this date

5-26-40

Vulture nest in Hobble Creek, Balsam Camp. Utah Co., Utah.
Examined nest in conspicuous red Eocene cliffs on left
side of canyon leading north of Balsam Camp. These cliffs
can be seen from the main canyon. (see notes of previous
years concerning some nesting site). On way up observed
two red tails hovering in mid air about 100 above east
ridge for 4½ minutes without perceptable movement of body.
No sign of vultures in air. Approached nest and could see
through the entrance into chamber. The bird was standing
about 1 foot east of the eggs and partially protected from
full view by the low entrance ceeling. Had was ready
with camera to shoot bird as it left entrance. It was not
until I had crawled nearly through lower entrance of cave
before vulture left via the upper floor level escape. The
eggs were lying on the floor of the chamber and facing N.W.
no attempt at building a nest, the eggs
being placed on the perperal edge of the
rubbish accumulation. The natural
surface of the cave allowed for this
rubbish to accumulate in this section
of the chamber. Eggs placed in same
part of cave as of previous years. No
permenent
signs of communal neotoma habitation
as of previous years except the numerous
neotoma dropping scattered over the
surface of the floor. The rubbish



accumula 400526-82 cup of dry sticks, one green juniper
→ tion was made →
bow, both down & flight feathers of the adult bird, bark,
etc. Chamber has a peculiar and definite odor of vulture.
Temperature of inside cave made 67°F. Temp outside cave = 66½°F
that can be detected even at entrance of cave. Eggs when
blown had embryonic and skeletal elements present. Chamber
circular with about a 11' diameter and lens shape in height th
being high enough to set in in west side and
low on the east side where nest was situated.
The entrance is precariously blocked with large boulders
any one of which would crush one if he were caught while
crawling up through them. When she left the chamber
she remained in immediate vicinity of nesting cliff for
the hour and 15 minutes that we remained at the nest.
During that time it soared soared continually in air
above us, sailing west directly above us, sometimes only
20 feet high, and then returning to repeat the cycle. Her
close inspection trip was made against the slight wind
which was coming from the west while her return trip
was with the wind and as she wheeling around the
wind would fairly shoot it back to the east again
with double speed. Her return trip was not so much
for inspection as the trip against the wind which allowed
her to inspect us & the nest with more deliberation in her
controlled flight. The return trip was made about 80 feet
farther out from cliffs than the initial inspection trip..
She was just as interested in the cave as she was of us
as she would look and turn head as she passed the
entrance before arriving at our station which was some
40' beyond. Her soaring was normally above but some-
times it was on same plane and sometimes below our
observation point. The only call given was when it left
the nest and was more of a fear sigh than a call being
given as an outrush of air rather than involving vocal
cords. Occasionally when in the air it would raise
its body above plane of wings as if for a momentary
relaxation. Dad left first but the bird remained
and indulged in its regular tactics. I then left and
after gaining the bottom of the gully it some 5 minutes later

it left the immediate area of the nesting cliffs. It in cercles some 300 feet above did not have a tendency to follow you in leaving the nesting site. It remained high for the next hour as we watched it from Balsam Camp below. It was interesting to observed how it left its nesting site as danger left its environs. Years previous on our inspection of this same nesting sight we found that the bird left and immediately evaded our presence. At Balsam Camp collected several specimens of Corallorhizza striata taken among the Conifer stands. Eggs of Vulture placed in collection. C. l. lateralis here.

[see previous page for proper entry] 5/20/40

Harry Chandler presented to me a Sylvalagus skull taken from the Provo sediments of Lake Bonneville some 10 below the upper surface. Just south of Springville cemetary. This skull (1-5-20-40), several vertebrae, scapula etc were placed in B.Y.U. mammal collection. Harry said that as far as he could tell the skull was in situ and not associated with any hole or den.

(see p 400530-86 for proper entry)

Hobble Creek Canyon for Sharp-shin. 6-3-40

Examined all nests at mouth of Canyon where set of previous years have been taken but no signs of the sharp shin. This area is at mouth of Canyon on south side above canal. The two families of mallard ducks and many other birds in the area would indicate that the sharp-shin were not here this season. Birds observed in main creek bottom below are: Catbird, Chat, yellow warbler, red-shafted flicker, sparrow hawk, mourning dove. Flowers numerous as well as Eclophonus graminea glaucous.

Alpine Canyon, Utah Co., Utah. 5/30/40

Dad & I & the Hutchins family spent the day in the Alpine area after the Dusky grouse. while traveling over the bench east of Lehi and along the main canal collected a set of Bullock Oriole eggs (5) in top of slender popular tree. Mr. Hutchings reports that last year he had under observation 5 nests of the oriole. The nests at the time had young. He made a subsequent visit to these same nests after a heavy rain storm and found them all dead. Mrs Hutchings found a nest of the mourning dove placed on top of a tumbleweed that had lodged among some willow trees. The tumble weed was on the ground without protection from above. a few dry sticks

had been 400526-84 nest construction. Another nest was
found upon the ground while another one was found in a
tree. From this bench land north of Tehi Inc received a
very convencing bet of evidence of a lake shore level above
the Bonneville level, also interesting Bonneville level runn-
ing east toward Sky Canyon or Alpine Canyon. While
at Power house at mouth of Alpine getting ready for the
ascent Mr. Hutchings and I inspected the west side of the creek
n.w of the power plant proper for sharp-shin. He had taken
a set of eggs from here last year so knew exactly where they would
be. This side of creek supports a good growth of Quercus and Acer.
an aspen or two along creek and a few Rhus Cencolor. Cornus
stolonifera, Betula and Rhus trolobata also laugh the creek edge.
The oaks are thick and in a natural stand. Several secluded
swails line the area. The ground was completly covered with
the dry leaves several inches deep. Soils very humus. Either
a severe winter or strong wind had broken down many trees of all
kinds and broken large branches off of others. This occured prob-
ably last winter. a few Sciuropterus g.g among this dense oak
area. In the more secluded swails found six nests of the sharp-
shin all placed in oak trees and in emediate vicenity of each
other and some 100 from the creek proper. The young sprouts
and lower limbs of nearly all the different species of trees
were exceptionally large. Returned to power plant and
in crossing stream took temperature of the clear beautiful
water which was flowing over the large granite boulders.
Temperature = 48° F taken at 12:00 P.M. Left for upper country
at 12:55 P.M. Followed up the canyon directly east of the
power plant to its head, hence down ridge to end of the
horzontal pipe line, hence north along pipe line, hence retrack
& then down metal pipe line to power plant. Gain lower
limit of canyon by trail in canyon to south a few hundred
feet. Mr. Hutchings reports killing a rattlesnake here at
top of the noticeable fault scarp. The Balsamorhizza sagittata
were drying and looked like a July condition. Flowers of this
plant having passed on beyond their blossoming period. As one
gained altitude this same plant was found to be fresher and
in flower. Sceloporus g.g all along the way. Continued up
canyon to where trail lead north to tresel of pipe line but cont-

ennued up main canyon keeping on the south 400530-85 → hillside. Took picture (5-5-30-40) of exact spot where the dusky grouse nest was taken last year. This picture (cancel) also shows skull of bear taken by Mr. Peterson Bear specimen no. 4-5-30-40. A coyote skull is used for comparison.

shows the general nesting grounds of this grouse being among the short shrubs and artemisia on the hillside and associated with the conifer stands. Mr Hutchings claimed that they prefer the edge of an opening of shrubs on such an exposure. Inspected such area to head of canyon but other than finding all droppings of the birds did not find any nests. At head of canyon collected a set of Utah Jays (2-5-30-40) eggs.

5-5-30-40

The nest, a good set of eggs, near bottom was on east side of canyon and associated with the conifer stands. nest placed in an Abies concolar 6 feet from ground in a 10' high tree. The tree was on the peripheral edge of conifer stand at edge of what appeared to be a snowslide tract. Nesting tree on side of gulch. The adult bird was confined at 2 and three feet but finally left and flew down 10' away a bit on hillside at base of main conifer stand. It sound a few hawk-like calls and the commenced its regular jay call. The bird called frequently and regular but its calling was not accompanied by antiaus or quick body movements as one would expect from the jay. I left the bird still concerned with nesting area however it did not approach near nest while I made examination. Nest constructed first of base of large dry sticks, then a base of substantial material miped with mud then pure mud and lined with dry rootlets The stick base, mud section & rootlets were easely separatable

2-5-30-40

400530-86

From the → head of this canyon ← followed west down flat ridge. Jumped 5 dusky grouse on this ridge. From here return to power plant. Mr. Peterson at Plant presented a Black Bear skull to me from a bear he killed 3 weeks ago. This large bear was killed in snowslide gulch just north of where the flume goes through a rock cliff tunnel. The bear was held in bay for an hour or so by a small fox terrier dog. He claimed that it would stand straight up on waist high shrubs to take frequent inspections. While one man returned to powerplant & returned to area the bear still remained near and was soon found by the dog. The skull (4-5-30-40) is now in B.Y.U. Collection and is not perfect being broken in on top and cut off too short at posterior end. Teeth show signs of age. Hide about 95 inches long with foot about six inch long (not actually measured). Mr. Hutchings considered it to be an exceptionally large bear. Mr Peterson reports 2 more bear on west side of canyon in head of canyon where Traverse range joins the granite mt. This large bear is undoubt one of the few remaining black bear of the range and is a sorryfully thing to think that such as a majestic beast should have been ruthlessly destroyed. Dad collected set of 5 sharp shin on east side of canyon on oak just a block or so up canyon from power plant. Considerable travertine rock at spring east of power plant.

(see p. 400526-83 for 6-3-40 entry)

Provo.

6-8-40

Stormy 6 and 7th very cold night of 8th. Lynn Hayward reports temprature 28°F at Aspen Grove. This storm was followed by extremely hot summer weather. Lynn reports nest of Cassin Purple finch at Big Tree Camp above Aspen Grove near Salamander Lake region. Placed in abies concolor and had 4 eggs on the 6-3-40. He watched them for a week so they must have been fresh at that time. He called a ♂ bird with normal testes which did not have the male coloration of red. (insert above date)

6-6-40

Reed Fautin down for supper. watched the Sandhill while eating. His work in Deseret is progressing. He finds that coloration is due to temperature and not light. Also the activity of annual life is governed by temperature and not so much by light. Gophers active in middle of day. Dipodomys range far for food. Blackthroated Sparrow, pair always together. All birds fly low. Two species of dipodomys in different habitats. He returns for another month

Lark Bunting and mockingbird present. No signs of sandhills. 400606-87

Rock Island, Utah Lake, Utah Co., Utah. 6-10-40

Spent the morning & afternoon up until 2:00 P.M on island with Reed Biddulph and Tom Barrett. Examined materials carried over to the Island by the gulls which included:

1. Cherries
2. Carp (Cyprinus carpio)
3. Catfish
4. shub (Sibroma atraria)
5. Pheasant
   - wing
   - head
   - tail
   - foot
6. Horse hair
7. Anabrus simplex (Mormon cricket)
8. Fish scales
9. Carabidae beetle
   - black
   - green
   - mice.
10. Artificial flower
11. Common grasshopper
12. Main kind vegetation
    - Scirpus bullus etc.
13. Pheasant eggs
14. Domestic rabbits
15. Citellus townsendii mallis
16. Regurgitated pellets
    - mice hair, bones, etc
17. Paper
18. Annellida
19. Bones showing butchers saw marks like ribs, chops, ham bones etc
20. Green pea pod.
21. Duck egg
22. grubs
23. Misc insects

I suppose that if one were to make a very careful inspection of the island for foreign objects transported here by the gulls and combined with stomach analysis, would find the list a long one and quite variable.

One band → (◎ U. H. & B. S. 2844 □) was taken from the leg of a pheasant (severed leg) which was very likely one carried here by the gulls from the mainland. In addition to the above articles found the cherry pits literally covering the surface of the area in some places. One is immediately impressed with the most evident reaction, speaking in the ecological sense, of gull activity upon the physical environment of the island. Very gradually or rather most drastically, the bare island, which upon its last emergence of a few years ago, is now receiving a new [redacted] but somewhat

superficial 400610-88 → trimming. → This new soil, in the form of rubbish, debrits and excrement created by the gulls will nodoubtt have repercussions unfavorable for the continual habitation of the island. If soils are formed that will tolerate the growth of such shrubs and trees as the popular, willow, tamarix and chrysothamnus the island will become unnhabitable for the present population, at least, of gulls. An island in a fresh water lake such as this one with all the favorable means of invasion for plants has an exceptionally good chance to become populated, providing again, a favorable soil can be created upon the otherwise bare rocky surface. Such a soil is now in the process of formation, much to the misfortune of its creators. One only must realize that it was only a few years ago that the island was entirely submerged and without vegetation and then look at it today with its dense and growing areas of willow, tamarix etc to appreciate the fact the invasion can & is still continuing wherever soils permit. The fluctuating level of the lake and reaction of ice sheets may interfer with a forward march ~~for~~ of the crowding vegetation toward its annihilation of habitat. Then again could it be possible that the present open areas free of vegetation now inhabitated by the gulls be such as it is because of their own unfavorable reaction, on a surface of the island, inhibiting plant growth. It could be highly possible that new soils are interfering and not encouraging disaster. It would be very interesting to make a stratigraphical section of some of the inland ponds of the island to determine sedimentation. One might even find remains of forms previously inhabiting the island. Had opportunity today to witness some of the more evident behavior activities of the gulls in relation to their concern and defense of their territories. The most interesting existing condition was the fact that the adult gulls were still tenaciously protecting their territorial areas in as much if not more attentive manner than during their egg laying and incubation periods. The few observations made regarding the activities of the birds are as follows:

1. All stages represented from eggs near hatching to young

3/4 size of parent with the greatest → majority of birds about 1/3
size of adults.

2. This period is probably the most critical time for the concern of the young when at a time they have sufficcent strength and physical development to leave the nest proper and walk about the immediate vicinity and confines of their territories with their parents and at the same time at a period when the birds have neither the power of defense or presence of mind to return to their own territories when driven out of their territories by an under the indiscriminate pecking of its neighbors. The great majority of the birds of the island were at this later period of this somewhat helpless stage where they were at the utter mercy of neighbors birds when on foreign soil.

3. An inspection of 300' x 6' ~~revealed~~ sections revealed an average of 12 dead young of all sizes, set sets of unhatched eggs and a few nest with young unable to leave cup of nest structure. The greatest morbidity seemed to be around the base of the low tamarix or areas of conjection. Many of the young were suffering to the extent of bleeding eyes, bleeding heads, unconscious wondering, near complete exhaustion lingering death where protected in thumbleweed patches etc. Some young had all the feathers off their head & necks with deep cuts on entire surface, this was found particularly with the larger birds which could stand such punishment. The method of attack was for the adult to take hold of the young bird head, neck, wing or bill and then hold on regidly or peck with the intention of killing. The final effect in many cases was all but realized when the young would call with definite signs of pain. Some would even fall about in a daze before again regaining their normal awkward movement. If man would continually keep the young birds in foreign territores and allow such sevice punishment to continued for any great period of time it would certainly mean the death of the young wondering birds. Fortunately for these young birds they organize into aggregatio m wh at appears to be neutral zones until the invader has passed on but to return to their own territorus from these neutral zones is a daring and ardous

journey. 400610-90 actually happens when man invades ~~those~~ these ↑ This is what → colonies of gulls. The adults leave by flying to the contigent and peripheral area made void by man or more frequently they hover and sail directly above ones head, calling continuously and even striking ones head occasionally with their feet & bill while the young ones, in a hurried walk, stumble out of your way on either side where they collected in groups of from 5-15 in what appears to be a neutral zone in already rightly established territories of other birds where they are relatively free from attacks of foreign adults in their new grounds. However it was observed several times where the adult bird whose territory these groups of young were infringing actually attacked members of the young aggregate. In the main, nevertheless, the group formation enjoys a certain degree of freedom from adult attack. As to the psychology of this formation I am at loss to say, it being likely however that they naturally collect as aggregate because it is the only logical thing for young birds to do when frustrated, that is to run to their adult guardians for protection and when adult birds are not present the craving for protection is satisfied by joining other young of other territories. This grouping of young is not a purposeful formation for protection from an enemy but just a normal natural reaction of the young for parental associated which is experienced by associating with other young birds left by the flight of the adult birds from the territory. However, it does seem to produce an effect that prohibits the enjoy of the young birds by the adults when in such a congregation of a closely compact group. At least they show signs of not experiencing (having) contact with natural enemies by hiding or evading, or making themselves less conspicuous which is very logical for birds that nest on isolated islands free from mainland contact. Now when one leaves or moves on, the adult birds in the air and with a perfect sense of land survey, immediately alight and begin establishing their identical territories. These are establish after a little readjustment without the concern of the young bird and it appear that the young are of secondary concern with

400610-91

with the adult birds, however I have observed the rightful parent of a young attack a neighboring gull that was pecking its youngone which had trespassed beyond its own territorial limits. The most trying times and, sometimes fatal, for young birds is their attempt to return to their own territories after breaking up their compact congregations and which follow immediately after the invader has left and allowed the parent birds to reestablish their area again. These young gull then must pass thru several foreign territories before finally reaching their own and each every new territory it enters it is received with a cruel and tortuous peck from the occupant of the territory. If the young bird is old enough to have a sense of homing instinct he is able to run the ruthless maze with half his life left when finally reaching home base but if instead the young are immature and lack physical strength & resistance to attack and must reach home by the trial & error method of bombardment they will place their life in jipardy. Such is the price they pay for being molested by human trespass. It was observed many times that the young ones pass from one territory to another in a semiunconscious state being critically attacked at each territory until finally it reached by trial & error its rightful owner. Now if these same young are forced to leave their own territories for too far a distance their chance of returning is doubtful.

4. It appears that the parents recognize their young but the youngs power of parental recognition is doubtful, at least to any noticeable or impressive degree

5. Parent birds have powers of factual or intrinsic identification but have no conceptions of numbers. For example 2 or 3 eggs or even 5 eggs in a nest, artificially placed is the same to a bird.

6. Young birds depend upon adult birds for shade. In some casts it is not the largest young bird that gets all the favors as they offer shade for the small ones, here a matter of the survival of the unfit, except of course when feeding preveledge are involved.

400610-92

7. adult gulls return → to identical territories.
8. Young return to identical territories & parents
9. Expect to find few epceptions of the above
10. To reestablish an area that hade been invaded, by man or disturbed requires several minutes of readjustment of young wanderings but soon becomes quiet & showing signs of stability.
11. Parents either regurgitate food or allow young to delve far down her throat. Sometimes the young head disappears and finally emerged very damp. Some of the younger birds take the food as it reaches the gape of the adults bill. In whatever form the food is taken it is ravenously taken even when picked up from the surface of the ground.
12. Cherry epcrement stains rock surface.
13. The young of birds when dead are sometimes eaten but more frequently trampled flat.
14. Male & female gchesally at nest.
15. Gulls approach island from all directions, particularly in morning but subside toward noon, flying either high or low.
16. Many gulls fly toward water & light a 100 or so feet from shore where they drink or eat something immediately upon alighting as if just being relieved of nest duty or washing some morsel of food or clearing throat of regurgitated foods
17. Caspean terns fly heigher than gulls when in their territorial areas. One nest now of 2 eggs, however several birds flying & calling overhead. Main Colony of tern resting on edge of island after unsuccesful attempt at egg rearing & incubation due to interference of gulls & man.
18. Peripheral edge of gull colony end abruptly on a homogeneous surface at several points.
19. No forster terns nesting or observed at island.
20. While walking about island pass thru. zone of weak & then areas of great volume of cries indicating possibly differences in population & Congestion
21. Crustaceans numerous around edge of water contact of island.
22. A Cormorant had a fish started but finally decided it was too large & rejected it wilfully (East side of islands)

23. Mallard ducks leave island in pairs on our approach.
24. The gulls have a variety of calls. One is given by standing normally and then by placing head low and directed backwards offers a few call in such a position & then flips head & neck upward in a vertical position & with gape held wide open & head & bills pointed skyward fairly laughs with good intent with breast vibrating with each successive Call. Given most any time and have noticed it particularly when one of a pair joins companion from the air, when man invades their areas and during general confusion. Another call is made when the bird is standing on ground or rock and is made by standing in a normal position and by dropping lower bill only in opening its mouth. The call is directive & somewhat sternly made being sharp & distinct. Their regular call when on their breeding ground and when being approached has closely is a strong and nervous call that sounds, in its deafening intensity, like the word ('help!) Other flight calls are given but did not have time to analyse. As to the Significance of their calls the solution is speculative as no apparent consistency of cause in offering them was discernable.
25. Young consistently feed on annelids, Anabrus simplex, grasshoppers, small fish and cherries.
26. List of birds and animals to date. (see previous trips for 1940)
    a. Bufo woodhousii (native)
    b. Pelacanus erythrorhynchos (visitor)
    c. Ardea herodias treganzi (visitor)
    d. Otocychus vociferous vociferous (native)
    e. actitis macularia (native)
    f. Phalacrocrax cruntus auritus (visitor)
    g. Larus californicus (native)
    h. Aechmophorus occidentalis (visitor)
    i Sterna caspia (native)
    j Anas boschas (native)
    k Merganser serrator (?) (visitor)
    l Branta canadensis (native)
    m nycticorax nycticorax (visitor)
    n Lepus desiticola californicus (visitor)
    o Domestic rabbit
    p Peromyscus maniculatus sonoriensis (native)

400610-94

Q. Mus Musculus (native)

r.

These forms have been actually observed on the island. If one were to include all likely forms to occur here or to list the birds that have nested here of previous years the above list could be increased three or four-fold. Some type of warbler is here probably the W. yellow throat (?) also one or two other that lacked positive identification such as some of the ducks and small migrating shore birds of earlier trip inspections. The pheasant eggs have been coming in regularly being eaten now in definite areas as if done by only a few birds. The early periods of incubation of gull eggs showed signs of pheasant eggs being eaten and in quite a few cases of the gulls actually incubating the pheasant eggs in own nest. During this period of the reproductive cycle the eight and consideration of eggs is most interesting among the gulls. Returned to mouth of Provo River in speed boat at about 3:00 P.M. Spent afternoon on lake in canoe to test the feasibility of using sail. Conclusion: Sail good for traveling with wind but only in that way and useless in traveling into the wind. Can tact into wind about 85° which is not enough to warrant its use.

6-14-40

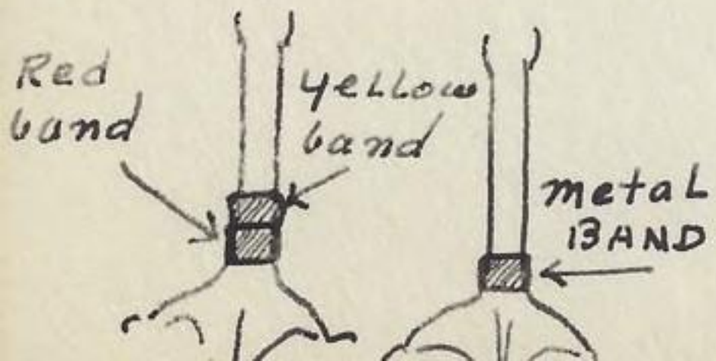
Provo -

Warm weather follow last week of extreme cold. The change most evident. Cattail from cattail seeds falling like snow & covering entire surface of ground.

6-1540

Rock Island, Utah Lake, Utah Co., Utah.

Purpose: To Band 1,000 young gulls. Dr. Tanner in cooperation with Biological Survey. W Woodbury of U. of Utah the week previous band similar number on island in great salt Lake. Party of: Dr. Tanner, Dr Beck, Dr. W.B. Hales, Reed Biddulph, Cleff Kopla, Blaine Carlson, Dwight Taylor & myself. Banding accomodation: metal band on gulls own left foat, basal red celuloid bond and upper yellow band on right foat. The identification of the bands are as follows:



use all of the 1.000 metal bands but had 4 pairs of color locality band left over which means that there are 4 or 5 birds that have been registered with a metal band but not the colored ones. In comparing activity of gulls of this trip with trip of 6-10-40, a week ago, find that the young birds had matured consederable and a great maporety of them were able to take care of themselves both in their ability to aekwardness by wading the adult birds and by defending themselves by 'pecking back'. Of course there were still many of an age indecive to effective attack by adult bird, many other nearing the size of the adult birds but still unable to use wing for flight. Very few eggs except a few unfertile one that still remained with young in nest and a few at the point of hatching. Did not see any indication of second sets. Surface of ground showing signs of trampling feet, obliteration of nests, general surfacing of excreta. One would never dream, as far a actual nesting material is concerned and except where bird is still incubating, that the island supported several thousand nest. Around some rocks will be found a regular trail made on the ground indicating that young birds have continually tried to gain surface of rock to be with their parents. Territories being held by the bird with all their vigor. Fewer dead birds (young). In handling several hundred young birds found several with broken bongs, deformed legs and quite a few with head injuries from adult pecking. Also found that thes young regurgitated more frequently in the morning hours than toward the middle of the day which would indicate that the bird are fed in the morning to a greater extent than in middle of day. The regurgitated material showed a predominance of earth worms with grasshoppers, Anabrus simplex, Cherrus and small carabid beetles making up the rest of the diet. Many other articles of food were include in menu but the above seemed to be most prevelent. The more intimate contact with the birds and their regurgitation act seemed to impress one of the great amount of earthworm etc being fed. but probably in reality the amounts were about normal. It appears to be

400615-96

a simple act on the part of the young birds to regurgitate and when turned over on their backs the act was stimulated. a group of about 100 pelican remained on west side of island resting on the off-shore rock projections or swimming back and forth. This is the first time such a large group of pelicans have been so loathe to ~~the~~ leave the island on our approach. Could it be the Group reaction of such large numbers have anything to do with their desire to remain. Have also noticed that the cormorants as well as the pelicans favor the deep spring on the west side of island. Temperature of lake at 6:30 A.M just out from mouth of river = warmer than the air atmosphere. Of the two eggs of the last nest of Caspian of last week only one egg remained today.

6-14-40

Family drove to dive of canyon down into Scaffold reservoir via Tucker. From thistle on noticed the way in which the juniper trees favored the more sandy soils of the geological formations above the Paleozoic. Definitely a matter of soils. Utah Co. is a large one and this section is certainly a good example of the juniper-artemesia climax, a section worthy of careful study. C. V. Utah 4 miles beyond thistle. Columbine beautiful in canyon leading south from Tucker. Upper limits good Zapus country. at Divide heard C. R. Grouse, and H. Thrush, Grey headed Junco, Robin, Hummer and B. H. Grosbeak.

6-18-40

Bravo,

Started recording the song of the Phoebe (?) at home. This bird appeared to call regularly in the evening & in the morning with such regularity that a recording of same was felt justifiable. Bird appears at same place each evening but has been heard at other somewhat distant point. These other calls however could be some other neighbor bird. Occasionally the Phoebe is heard during middle of day but its evening & morning calls are so regular & definite that they must be associated with times incidental to sun setting, daybreak temperature or some other factor. Sun down at about 7:50 P.M.

Date	morning	Started in evening	Ended	weather
6-18-40	no record	8:10 P.M	8:25 P.M.	Very warm. 104°F M.
6-19-40	Daybreak	8:00 P.M.	8:23 P.M	Dust storm today quite now, skies clearing
6-20-40	3:40 A.M	7:25 P.M	8:25 P.M.	Hot.
6-21-40	3:45 A.M	7:40 P.M	8:25 P.M.	Today warm. now occasional breeze. Sky clear.
6-22-40	3:40 A.M.	7:58 P.M	8:23 P.M.	

The morning records do not indicate the starting or ending of its song but it looks suspecious that I should be awakening at the same time each time. The habet of the bird is to set upon a uppermost limb of the weeping willow tree and sing, interupting only long enough to fly out and catch an insect and return. Sometimes it will fly to another perch or another tree but in the main it uses the top of the weeping willow tree. Interfering on graund does not seem to interfer with the contunuety of its song. Observed it started one night and it was shaking and ruffling up feathers as if it had just left its nest, a common procedure of many brooding bird upon leaving there nest. The verbal denotaton of the phoebe is a pewit phoebe which if acquainted with the song is applicable The first call is a series of different note followed by a sharp note. The two calls are together its normal call. The first part again is variable while the last call is a sharp, monotone note. There is also a muffled warble given regularly and mixed in with regular calls. When close at hand it sounds like an attempt at a warbling song. There is also a song which is difficult to express and is more irregularly, and unfrequently given. Its regular call of two parts ~~con~~ is divided into the first call alone and the last call alone. The last call has two intensities depending upon whether it is given alone, when it is soft, or when given in combination with the first call when it is loud and accented. Found that the regular song of the two note combination is given an the average of 10 per 3 second and that the last note when used alone is given an an average of 1 per 3 seconds. Here is a recording of part of its song on the 22nd.

Key: 0 = unusual; 1 = first note; – second note; m muffled warble; the number ⑩ indicating lapse of time between insect catching etc; + = normal call

--m---------- m---------m-----mm------m-m m-----------m---m-----
mm m-m-mm---------- mm --- mm--------m 9:59 P m ---------- mmm- m---------- m m
---mmm-----+++++++++++++-++++-⑮-⑳ oo--o-----mm---------m-
-m--mm---mmm-+++++ +++++++++ ⑩ +++++++++ m m +++++++++ 1+ + + + + + +
+++++++++++++1 mm---④+m m-m-----m m----mm--------m m-----+1
-++++++++++++++++++⑤m m----m---m---mm----m--------++++++++
++++++++1 ㉕---m-mm--m-----mmm--++++++++++1++++++++++
1m-④----------+++1 +++++++++++++++ ⑳ ---------- stopped at 8:25 P.m.

In general the first two – calls given before the + call is emphazed. The + symbol = 1 plus – call given together which constitutes its characteristic & regular call.

400622-98 6-22-40 Provo, Utah

Recorded another evening song of the Phoebe from, beginning to the conclusion of its song. Recorded at 30 feet distance at 7:45 the clouds were tinted but the sun had already left the city & highest mountains. at 7:55 P.M the yellow warbler and Robin were still calling but they soon quit. Day today normal being hot in afternoon, slightly cloudy during afternoon & clear tonight. Air still. Key same as of notes under 6-18-40 but with the following additional description.

+ = regular call being made up of two phases the first phase a series of notes of regular but different notes accented on the last syllable while the second phase is distint from the first phase and follows immediately as a sharp single note. When close to the source of the call the last phase is in reality made up of two note the last part ½ step lower, however the call of the last phase are as one quick sharp call note.

| = This represents the first phase of the above regular combined call but is given independent of the second phase.

— = This represents the second phase of the regular call when given independent of the first phase. When used in this way is is softer and a monotone

mm A modfication of the first few note of the first phase of the normal regular call into a variable soft and delicate somewhat rolling muffled warble.

(4) Time interval of no calls. / number = seconds

Complete record of call

hoarse

Started at 7:58 P.M mmmmmm——mmmmm—mmm—mm+++mm|+++++
1—(35)mm—(4)—mm————m——(8)mm——mm————————breezy (7 minutes) mmmm
———mmm—+++++++++++++||+++mm—m+—+m———1—+++++++1+++
++++++1m(6)——————————m————mm——+++++++++++++++++
m(15)—(4)—————mmm———+++++++1+++++++++++++1m(12)————
mmm——mm——+++++++++++++++++++++++—(25)————mmm—+++++++
++++++++++++++++—+—++++++++—(12)m——————————m+++++1
+++++1 ← 8:20 PM +++++++++——+++++——mm—mm————+++++1+++++1+++
++1← 8:23, Bird concluded song. I at this time could still readely read printing at 12". This record tonite is complete and more accurate than record of last because of profiting from previous experience, thus producing a more accurate recording of its calls. It is interesting nevertheless to see the close correlation between the two recordings

Brows. Recording of Phoebe calls 400623-99 6/23/40

Phoebe started calling exactly at 3:45 A.m this morning which was about 2 minutes before I could detect any indication of daybreak. Daybreak is the most likely thing that initiates its call. It call a vigorous one lasting until 4:31 A.M. The call was its regular call of two phases. However, occasionally would hear its (w) call and (—) call. See Key of previous recordings. From 3:58 to 4:16 A.m it called interruptedly offering is regular two phase call without modification. calls averaged 22 per minute varying from 20 to 25 calls per minute Song a faster one in morning than in evening. Could not read figures on watch until 3:54 A.M. without aid of artificial light. Bird called occasionally through the entire morning but its calls were only of the (—) call and not associated with the regular call of this morning. When given averaged 9 calls per minutes at a distance the regular calls sound like 2 notes to each of its two phases. In the first phase the last note is a step higher than first note and ends with an abrupt flip. The second note of the second phase is about 1/2 step lower than the first note of the second phase. In general this early morning call is very distinct from the evening call is is given with a more vigorous mood and persistency of the same regular call. Bird called earlier than usual this evening but exactly on time at 8:23 P.M.

Brows. 6/23/40

Reed Biddulph took 50' of [redacted] Kodochrome and 50' of black and white movie of the sandhill Crane in backyard last Thursday.

Aspen Grove, Mt. Timpanogas. Ut. Co. 6/23/40

Spent the afternoon in conifers and aspen on hill just south of pine flat which is north of aspen grove and N.E from head of dugway. This area has a favorable exposure for conifer growth. It is a rather isolated grouping and may represent a remnant of the climax montane forest. The Abies concolor, Douglas fir and Picea engelmanni, Populus tremuloides, peach leaf willow (?), large maple, and Prunus are represented. The oak are found on the south side of hill, aspen on top with few large maple which appear to be nearly crowded out, some being dead while others with weak foliage and fragile upper limits. Few Prunus melanocarpa on top but found among the oak-open zone. On top and west side one finds a group of young conifers (Abies concolor) among the aspen stands. These conifers are about as dense and matted as I have every observed. The Picea engelmanni border pine flat on the south side and dominate this zone as a

400623-100

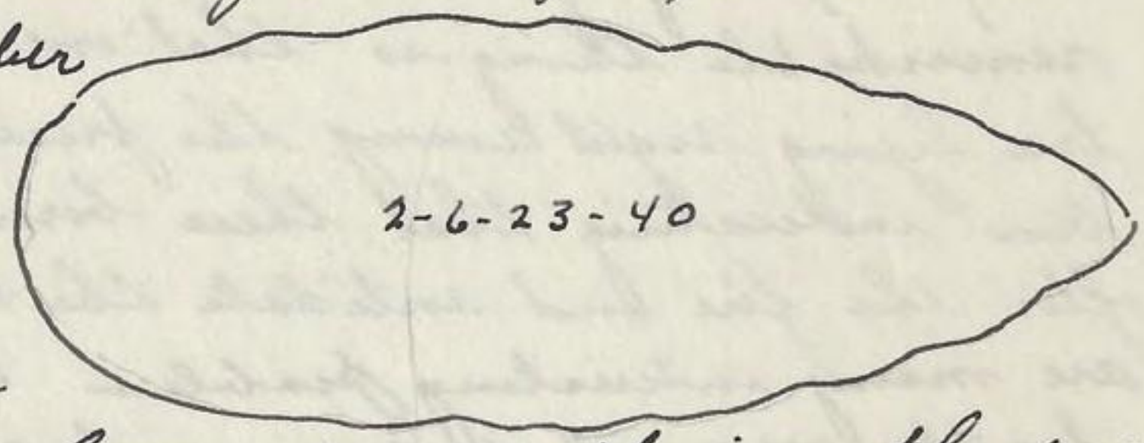
solid stand without to underbrush vegetation. As one advances up the hill he finds the Abies concolor, Pseudotsuga mucronata mixed with aspens. On the flat portions of the hill where the large aspen are found as dominant one finds the living and dead Abies Concolor of monstrous size some being 4'1/2 feet in diameter. and over a hundred feet high. These large conifers are not associated with the small conifers of denser stands. Examined one Abies concolor (?) 85' long & about 4' in diameter that had fallen over. It state of decay indicated on first examination as having been on the ground for a long period of time. The bark was off, the outer wood falling off, the top surface decayed and the side supporting a taleus of the deteriorated accumulations of the decaying tree. thru through this side talus and inspected the originale surface of the ground upon which the tree had fallen. Made inspection 15' from base of tree. Found large piece of thick bark that was lying upon the ground and was not connected with the surface of the tree. Found these same piece on a 20' radius around the stump of same tree. Considerable limb material with some with their original bark still adhering. Steels limbs mainly conifer. The Symphoricarpus represented as well as the Prunus melanocarpus. The latter is not now in the immediate vicinity of the area except those found higher up hillside on top. No bard adhering to tree except on limbs & higher up tree where large slabs appeared to belong with the tree. Many limbs and pieces of bark burnt. No evidence of aspens buried beneath although dead aspen limbs all around on outside. fallen tree, at least 15' tree lying about S.S.W having been pushed over from the north. all this seemed to indicate a great age since time of its becoming forced to ground, particularly the general crumbling state of the decayed heap of the once dead dry but probably sound conifer tree. However when inspected by aspen along side of fallen tree found that they had been affected by the falling tree at the time it actual fell. The two aspen directed scared ~~used~~ were about 4 inches in diameter dead but with white bark at base. This evidence was against my theory that the tree had fallen a long time ago, at a time when the vegetation was probably different than it is now. The combined evidence would indicate then that the decay of a fallen Abies Concolor is accomplished in a tremendous

short period of time. Nat over 5' from the end of this tree is found a shell of an Abies Concolar some 12' high, and 4 1/2 feet in diameter near base. The outside is smooth but the general constitution rather unstable. The center is still present but experiencing a greater degree of decay. How this stump is still standing and holding together in a remarkable way but [redacted] a critical inspection on all side of cleared boulevards and soil surfaces failed to find any evidence of the part of the tree that had been broken off. This would indicate that when a conifer remains upright in its dead state it can resist the elements of decay but as soon as it is on the ground where it is subjected to moisture, fungus etc its life is short and remarkable short at that. Most of the large conifers show signs of fire scars particularly at their bases. The remarkable thing is that one finds burnt fallen Spruce tree lying right among the present stand of dense, dry trees indicating that these burnt tree have remained there after the fire and antidate the new forest of spruce. There are many interesting problem connected with searching for the original picture and climax forest of the area and the above, if approached in a carefully planned and specially conducted, should throw some light upon the subject. While digging under the fallen tree found a runway of one of the smaller mice. Found a Coyote body among Conifers indicating a natural death, as having been shot, found its dying grounds among Conifers. No legs injured by trap as far as I could tell. Collected the skull and fast measurement. Skull no (1-6-23-40) with fast measurement at apprat. 7 1/2 inches. Located three nests of young of the R. N. Sapsucker. Two of them not over 300' apart, the other 400 from 2nd nest. The young can be heard for some distance particularly in late afternoon when adult birds are actively feeding young. The young are still too small to come to aperture. They call 260 times in 1 minute. Each nest produced same regularity of calls. The calls are all a variation of the regular mechanical note, depending on accent or volume of sound. Birds react in change of voice upon entrance of adult into hole or by vibration of limb. One adult called outside but young did not vary calls.

400623-102

Nest placed as follows. 1 = dead tree - 10' above ground
2 = live tree 40' above ground
3 = 50% dead tree - 11' above ground

One adult bird found it necessary to wiggle out of aperture being so close fitting. Male more daring than ♀ concerning approachabelty of nest in presence of one presence. One nest on peripheral of aspen opening, one among conifers and the other on flat of aspen surrounded by aspen & large Abies concolor at the spring at N.W. side of area rechecked the place where spearpoint was collected last summer. did not find evidence of habitation so likely it was accidentally lost while being used in hunting at the spring. The point was taken 15' below head of spring but the area has undergone considerable change due to abnormal sheep concentration at the watering troughs which are placed there for that purpose. This point will receive the number (2-6-23-40) and will be placed in regular collection.



I am sure that the ancient peoples have used this area as a summer camp, with the large spring offering the essential consideration for such a camp. Dad found set of cold Audubon Hermit thrush eggs near spring. Two adult thrush near with worms in their mouths. One large Abies concolor with outer shell only, forming a long & deep recessed chamber which would make a good nesting site for a turkey vulture or a hibernation den for bear. True burrt. The red-tails (nesting in area), tanagers, and H. Thrush, Ruby Cr. Kinglet, G.H. Junco, Phoebe, Wright flycatcher(?), robin, R.N. Sapsucker, Sauce wren, no evidence of Utah Jays although they are generally found here, Swallow sp., nuthatch, and R.S. Thrush in this area. Ctellus armatus as numerous in conifers & aspen as in open field below. Gophers active & numerous. Ctellus trails & holes on hillside. Heard Cantamis. Ctellus bird like call lends life to the aspen area when other birds are inactive. Birds begin to sing and present themselves in late afternoon. Very little activity during early afternoon. On returning to Provo Counted 6 C. armatus between Aspen grove & Wildwood. Ctellus on delta east of Wildwood, other by canyon toward deer Creek dam. Ctellus v. utah recorded from. mouth bear canyon, Provo Park, 1 black dawn canyon from Springdell and one at mouth of Canyon. At Pine flats again found that the obstruction of conifer growth is about 4½' high.

Provo. 6/23/40
Arrived home just in time to hear the Abadie finish its evening call at 7:23 P.M. Always favors a particular dead twig on top of weeping willow tree. Caught several insects in air tonite using its perch as base of operation.

Provo, 6-25-40
Reed Biddulph took another 50' of Kodachrome of the crane in its nuptial dance at about 8:45 P.M. in back yard.

continue on following page.
↓

[INSERT] 400625-104

4/25/40
entered this date for some of photos of 6/28/40 and 6/29/40

11-6-28-40
(see p. 115 for info on photo)

ne

4-6-~~28~~ 9-40
(see p. 118 for info)

4a-6-29-40

(see p. 117 for info.

400626-105

Trip to head of South Fork 6-26-49 and adjacent country.
made solitary trip for 4 day duration with objective in mind of specifically recording the activities of the mammal and bird forms and to find out more definitely something about the few remaining bear in this vicinity. Such a trip involved the regular type of camping material to be pack on back and the following food items: concocted three standard meals and then duplicated them each day. These meals are:

Breakfast. 4 slices of bacon, 2 eggs, 1 potatoe, 1/2 pint fruit, toast and butter

Dinner. Can vegetable soup, 1/2 pint fruit, bread butter, cookies, candy, postum, milk.

Prepared lunch. Cheese, chocolate, canned meat, bread butter raisins and peanuts.

These meals can be rearranged as to dinner - breakfast etc. The number of meals used are: 8 breakfasts, 3 dinners and 3 lunches (trail lunch.) The itemized list is:

3 cans soup	14 cookies	3 canned meat	1/2 pint yarn
12 slices bacon	20¢ candy	cup raisins & peanuts	
6 eggs	4 cups postum	1/2 pint butter	
3 potatoes	1/2 lb cheese	salt	
3 pints fruit	3 chocolate	sugar	
		2 small cans milk	

Left mouth of Big Springs Canyon (?) above Giles ranch in South Fork of Provo Canyon at 6:10 P.M. drove up as far as passable. Planned on continuing up Big Springs to head at Windy Pass this evening and then to marsh drop over into head of Shingle Mill. 6:25 Met first ferns in canyon among aspen and maple. 6:28 P.M first large spring on left hand side of canyon. Many ferns and green mosses associated. 6:37 P.M forks of canyon, took the left hand fork which is inconspicious and can be missed. This fork is small, and without much canyon bottom. Densely treed with aspen with deep erosional gully occupying the near entire bottom. at 6:38 found very fresh tracks of the bear in the dusty trail leaving perfect impressions. Dusty trails are found at the lower limits of the canyons. The hind foot measured 9 inches in length. The gait measured 24 inches. These tracks continued up canyon. Tracks probably made sometime today 6:50 P.M) Coyote tracks going down trail Bear tracks left at this point having followed along trail for some time. Deer tracks trending down trail. 7:00 P.M Snow slide coming in from the east side. These slides block erosional gully with rocks etc. 7:25 the Fork to left was taken. High cliff ridge to right. Bees in conifers Porcupine in trap here. Continued up canyon. Trails keep on right side of canyon and finally gains high plateaux which leads to right fork of upper cirque. 8:35 P.M arrived at base of deep gulch which issues from last cirque. This canyon supports one large

cirque which is divided at its extreme head. It is at the base of the right hand cirque that was chosen as station no 1. Immediately set up camp and after a quick supper went to bed. Evening quiet without much breeze. Sky clear.

Head of South Fork (continued) 7 6-28-40

Up early and prepared to break camp. Last nite the gulch supported water but this morning the water had ceased, the flow probably being dependent upon the melting of the snows during the day. Mice not active at camp. The green tailed Towhee and W. Cr. Sparrow sang early. The birds and mammals present are: Citellus armatus, Nucifraga, Cyanocitta, Thrasher, Thrush, Chickadee, Dusky grouse, Hummming bird, Lazuli Bunting, a large flycatcher and Am. robin. Yesterday while coming up heard the dusky grouse drumming. The water ouzel was also observed at the spring of yesterday at 6:28 P.M. At camp here found the Alpine fir, Abies concalor, Pseudosuga mucronata, Pinus flexilis and aspen. Castelleja and blue penstamens dominant flowers. Elderberry in last stages of blooming. Left camp at 7:10 A.M. The deep gully at end of valley 60 feet deep and 60 feet wide. The trasional gully continued halfway up cirque to ridge. One trasional gully on S.W cirque nearly reached top. One on S.E. nearly to top. Linglet and Tamiasciurus present. Deer tracks on trail. 7:35 A.M a adult dusky grouse with 3 young about 4 inches long. The young could fly. Coyote droppings frequent. Top of ridge at 8:00 A.M. Find the citellus armatus on ridge on the south side where the vegetation is stable and wind strong. The main plants are the artemisia, blue penstamens and bunch grass. Its call is three quick calls and then a longer ending call. May only give three fast calls. Calls given at the rate of 9 per minute. The call is mainly given while standing up. It also has a rattling call. The vegetation obeys to the laws of the winds and becomes disturbed or absent on ridge proper. A bee lit on rock with a live ant hanging on its leg. From this point on Windy Pass which is the lowest pass on ridge went west along ridge and cut across to ridge on west side of cirque no 4. In Conifers before reaching ridge found an old robin nest with 3 eggs. Nest placed in an alpine fir (?) From this ridge saw 1 Eut umbrinus, House Wren, Red-breasted nuthatch, Hairy Woodpecker, R.S. Thrasher, robin, Clark Crow. at 9:30 a golden eagle flew thru cirque nos. 5 and 6 and lit in a partially dead tree in lower branches. Sparrow hawk also flying around cirques. On the ridge between cirque no 4 and 5 supports crenoid stems 1/2 inches in diameter. Numerous deer tracks. Other birds on this ridge are: Solitaire, & Hairy woodpecker, Chipping sparrow, flycatcher (Sp.?), Abies concolor, Ceanothus and a few aspen. Pinus flexilis also here. Back to low pass of cirque 4. at 10:30 A.M. Find the citellus armatus mainly on south of

27 6-28-40

Windy ridge. Fresh deer tracks in trail on 400627-107 windy ridge. This ridge is a regular highway and used by the deer, bear, coyote, porcupine, bodger etc. Such thorough-fares should be considered when building roods etc. and not interupt these natural trails. From here went east past cirque 3 and up ridge to first knoll and then cut around side through conifers to the ridge between cirque 2 and 3. and hence north along this lateral ridge to low pass among timbered slopes where I established my second station. This station is so situated that it offers easy access to most any point. Water is always a problem but fortunately a few snow patches remained among the more sheltered patches of timber. on the timbered divide. The pictures indicate the ettent of snow in banks in lee of ridges. After putting up tent, organizing camp and getting dinner out of the way left at 1:30 P.M and explored the station ridge to the north S. to its terminal before it dropping down more abruptly. Left here at 2:35 P.M and returned to camp at 4:30 P.M. Rock dove added to list. Deer trail along ridge. From Camp went to peak between 2-3 cirque at end of station ridge to observe sun set. On way saw 12 clark Crows with 3 of them in one group. This ridge head above camp is a favorite place for the crow. They were feeding off the conifer branches and were observed to be picking off small insects. Other birds here are Bluebird, Utah Jay, Chippy Sparrow, Thrush, flicker, siskens and cassins purple finch. No deer. At the head of this ridge and to the west is a small hanging cirque that supports an unusual number of birds. At 7:42 P.M flushed an adult grouse at 7 feet. It had seven young averaging seven inches in length. Sun off east ridge at 7:32 P.M. Sun off high golden peak which acts as south wall of cirque no 1. at 7:46 P.M. Returned to camp. Mice active at 8:15 P.M the one observed probably a Clethrionomys or Phenacomys. The thrush was the last to call and it quits at 8:20 P.M. Temp. at 8:25 = 60°F Wind subsided after sundown. Now cool breeze. Bed at 8:30 P.M.

Photo 2-6-27-40 to

Head South fork Provo Canyon. (continued) 6-28-40

Temp. at 6:15 A.M = 60°F. Planned this morning to take lunch and inspect cirques no 1. and the ridge bordering to the east. Intended to keep complete record of animal and bird forms. Left 7:10 A.M from station 2 and trended up ridge to last steep ascent, hence east across cirque 2 to ridge pass leading down into cirque no. 1. Here at station no 2. one finds a beautiful timbered pass of Pseudsuga and Engelman Spruce (?), exceptional large and tall trees. The pass is gradual on wooded, west side but steep and abrupt

on the → east side. This ↑ pass is used by deer considerably.
The conifers are all sizes mainly 2½' thick and towering. Very little vegetation beneith them because of shaded situation and soil type. Many fallen logs. This protection has allowed 6 or 7 small snow batches to have remained. These snow patches average 10' x 15' but will soon be gone. Conifer needles orient themselves in long parallel lines at peripheral edge of snow and progressively run back to present snow line indicating a periodic or daily melting line. These banks are the only source of water in immediate vicinity. Started recording as I left camp at 7:10 A.M and received such a reception 2 knights calling, chickadees fussing around in conifers. Citellus armatus calling. Clark Crows calling on ridge above, 2 red-breasted nuthache calling. one nuthatch being pursued by a large fly catcher. Chipping sparrow calling. All these birds were at camp and frequently heard all all times. 7:15 A.M. Citellus armatus in timber. Large deer tracks in timber. Side hill wet with dew. Butterflies numerous. Several good signs of Tamiascurus but the animals not in evidence Claytonia, gooseberry, Thalictrum (?), mertensia, elderberry, Lupine just coming, a yellow composite the conspicuous plants. Robin and pine-siskin calling. The lines of dead conifer needles and scum associated with receeding snow bank. 2 audubon Warblers. 7:23 A.M. 2 grey headed juncos fighting and chasing each other among the conifers, 2 audubon warblers calling. 7:30 A.M near head of clearing and on east side of opening in shade of Conifers flushed an adult dusky grouse with one young. There may have been more than the one young but this one was observed. as it could not fly I captured it and found it to be 140 m.m in length. When returned to the ground it immediately hid in vegetation. The adult was concerned and remained about 40' away. It was extremely impressed when the captured young would peep. It continued to call and crouch low even after I left. This clearing is above camp and on north exposure of N. S trending ridge.
7:31 A.M Six clarks Crows flew down ridge calling as they flew. They have a very interesting wing sound. The vegetation in above mentioned clearing bordered both conifers supports a young growth averaging 8 inches high and of the umbelloid type, junous grass, mertensia, buttercup, yellow sunflower, a composite, geranium, and a basal mat grass filling in between as well as other types of less dominance. Gopher digging numerous and nearly completely effecting soils. however not many active ones. many winter cores. 7:37 A.M now on west side of ridge. This side of the supports the conifer trees while the east side which should logically support a dense conifer growth is nearly destitute of Trees. This condition prevails on nearly all N.S trending ridges. On this ridge on west side one finds the

Pinus flexilis and Pseudotsuga the → dominant tree. The → flexilis inhabits the more rocky situations. Few sage, castelleja and a few white columbine, very sparse vegetation. A yellow umbellaid plants present and conspicuous, white daisy, large and small blue penstamens and few Gilia some of which are white and light pink. The trail follows up ridge about 150' down west side. Large deer tracks in trail. Siskins flying up ridge. 7:43 A.M. nuthatch (red breasted). Siskin flying down ridge. Their presence more or less continuous. The umbelloid plant does well in this exposure. 7:45 A.M. 3 clarks crow. Flicker calling and drumming much as in spring and breeding season. Fresh deer tracks trending down trail probably of last nite. 746 A.M Siberian jumper, few small aspen, Alnis concolor also present. Can hear the green tail towhee. Flicker calling. not same as above. 2 juncos concerned as if harbouring young. Group of nuthatches at head of ridge. 7:50 A.M. Saw one to a flock of 7 young dusky grouse and the adult. These birds were probably those observed last nite observed on return to camp. The young were variable in size but averaging 8 inches in length. They all had good power of flight and left the vegetation without any noticeable warning call of the parent bird. After the young escaped the adult bird ~~common~~ flew up into a conifer tree and commenced to cluck but was not so much concerned about her young as the bird met up with earlier this morning. After a few seconds in the conifer tree she flew down hill and around to the north and finally alighted out of site and then commenced her calling again some 100' from where she was originally flushed. The young flew either into trees or further on upon the ground some 100-200' fut away. These birds were flushed some 500' up ridge from the point where these presumably same birds were flushed last nite. Continued along ridge and met a ♂ bird in trail 180' from the parent + young group. 7:55 A.M. Continued up ridge to base of last abrupt ascent. Several beautiful Pinus flexilis on ridge making beautiful silhouettes against the morning sky. From here left ridge and on a horizontal grade crossed the head of cirque no 2 and arrived at the ridge pass leading down into the head of cirque no 1. From divide of 7:55 A.M, Can hear to the west, toward cirque 3 G.T. Towhee, clarks Crow calling continuously, flicker calling, chipping Sparrows calling, grasshoppers present, 2 sparrow hawks flying together, ~~sisken~~ in air. The head of this secondary cirque at head of camp ridge has always been a favorable abode for a great many species of birds. A short distance on horizontal

level from 400628-110 → 7:35 A.M came to crossonal gulch with continuous snow below its forks. Citellus armatus calling. 8:07 A.M. Saw 5 citellus armatus but they did not call as usual indicating that a census by calls along will not give true population picture. 8:08 A.M. Citellus armatus. The gopher diggings are generally distributed with some inhabiting the rocky soils. Their diggings and core are nothing more than small rock. 8:12 A.M. at rock slide. Pika called on approach but was not associated with the slide proper. 8:13 A.M. 4 citellus at different points. 2 chipping sparrows. Arrived at divide into cirque no 1. on ridge between cirque 1 and 2 at 8:16 A.M. This divide is used by deer in crossing. On the west side of this divide and below can hear the Clarks Crow, 2 robins, 2 chipping Sparrow chickadees, flicker, And. H. Thrush and 2 citellus. The clarkes Crows are in evidence at all times. 8:20 A.M While still at divide. Can hear the marmot calling from base of rock slide of 8:12 A.M.

This animal did not call until I had crossed the cirque and had been at divide some time. Observed a grey-headed Jenes chase a Clarks Crow. Utah Jay. Leaving divide at 8:22 A.M. to Pinus flexilis just off knoll and a couple of hundred feet east of Pass. This magnificant tree is ideal point for observing the head of cirque no 1. From this point can hear several pika and marmot directly below to the south in the talus and moranic accumulation. They did not call very frequently. The ~~nuthatches~~ nutcrackers calling from high on peak bordering south wall of cirque no 1. Heard Solitaire sing which passes a song much like the robin or grosbeak. A few bluebirds flying about the cirque. and pair of ♂ and ♀ near. Rock Wrens in talus below and calling. Hummer passed. Chipping Sparrow on both sides of cirque. W. Cr. Sparrow singing. Bees, butterflies and insects in general numerous. Rocks frequently being dislodged from south peak. The head of Cirque no 1 at Rock Camp of divide streaked with crossonal gullies but none of them over 1/2 foot deep. To the east can hear flicker calling and drumming as well as several And. H. Thrush. The thrush are also singing high above perpendicular cliffs on south peak. Swifts flying by. Grasshoppers active. Citellus not very active. From the base of this lone Pinus flexilis left at 9:00 A.M. and dropped down into cirque and hence advanced at a leisurely gate to the east through this cirque no. 1. Before leaving, however, for the head of this cirque no 1 followed N.E along medial ridge between cirque 1 and 2 for a short distance to point where it drops abruptly. Left for this trip at 9:25 A.M. The Blue Penstamen dominant flower. Found a good camp spot being flat and protected on all sides by conifers with vantage points in any direction. On the first knoll found 5 fresh deer beds. On 2nd knoll to east and highest one found 1 deer bed. 1 buck left here and ran down S.E 3/4 of

slope and then pause. ofleworlah et raw into → timber in cirque. → about a four point. It left very quietly and hardly noticeable. This ridge shows signs of being continually used by the deer. Sparrow Lark calling on ridge. Townsend Solitaire calling like Black-headed Grosbeak. 2 Clark Craw called like a croaking frog. 2 of them flew by and then stopped. This call is given either on the wing or when in tree. From this point can hear the red-breasted nuthatch, Clark Craw, Eastern ruby Cr. kinglet, Citarnatus. The black-yellow (predominately black) swallowtails present. Left from this vantage point at 9:30 A.M. and returned to point of 9:00 A.M and hence to head of Cirque no 1. This place, 9:50 A.M, is the head of cirque at base of last talus slide. Conifers and moranic deposits conspicuous. Running water from last remaining snow banks. 8 rock wren calling in talus slopes. Also 1 dusky grouse and robin. From here plan to quickly traverse the successive levels of this cirque and gain east cirque ridge and on return trip spend more time in cirque proper. While crossing floor of cirque flushed 2 groups or families of dusky grouse. One family of adult and 8 young ranging from 3 inches to 5 inches long and one family of adult and 2 young ranging from 3 inches & 4 inches in length. There may have been more than the 2 young but that is all I could flush. The first group was observed before they took flight. The parent was crouched in ground with young near. Continued east to base of east ridge thence up trail to base of first set of cliffs. From near here took picture (2-6-28-40) of east face of high peak showing talus slopes, snow condition and vegetation of cirque. From here gained the part of trail that is now more or less horizontal and continues north to end of ridge checked numbers of animals as I leisurely walked along this trail from 11:00 to 11:18 A.M. and are:

Chipping Sparrow	2
Cetellus armatus	12
House Wren	4
G.T. Towhee	1
And. Warbler.	2
Nutcracker	2
Tamiascurus	1
Deer	tracks only
Coyotes	droppings only
Dusky Grouse	1 adult 6 young seven inches long
Eutamias umbrinus	1
Pine siskin	3

2-6-28-40

The young grouse left first and then followed by the parent bird. which had to be flushed. at the point of the ridge found an old sheep camp. From here went down ridge to precipitous drop-off and then back again to sheep camp. a white breasted nuthatch being the only new bird seen on this side trip. From here at sheep camp

left at 11:55 400628-112 → for top at last ↑ end of main ridge arriving at top 12:16 P.M. The birds observed up this north end are. 8 pine siskins, 5 chipping sparrow, 2 clark Craw, 1 Utah Jay, 5 house wren, 1 chickadee. Numerous grouse droppings among Conifers, Three large snow banks lined up ridge but not continuous. damp below banks and but no H_2O issuing. Near the top found the young conifers invading and ranging from 2' to 12' high. On top 12:16 Butterflies of all kinds in confusing masses as they flutter on highest knoll. Blue penstamen and castelleja dominant plant, at least the most conspicuous one. They are found on west side of ridge and top and not too far down from ridge on east side like  . The only snow on the east side of this ridge is 1 square foot patch which was just about enough for dinner. Hairy woodpecker. This snow patch had peripheral edges indicating that snow had but melted recently and new vegetation had not invaded as yet in an otherwise dead and brownish area. This snow patch is just east across ridge from burnt timber area of west exposure. At dinner on large isolated Conifers on east side of ridge just north of last large and dominating divide. (not divide near high but rugged peak farther beyond). At this point flushed 2 families of Dusky grouse. The first family consisted of 1 adult and seven young. The second family of 1 adult and six young. These birds were about 100' apart and their actions indicated cooperative and mutual indications. The large Conifers here are Pinus flexilis mainly and directly across cirque to south is a red streak or dyke: In case of the first family a young bird left first and then the adult left with a sharp call. It flew into tree and remained quiet. The other young did not leave for 2 minutes. 2 more flew up and the adult by now was partially clucking. The second family left with adult first. She flew without a call and lit in same tree as first adult but in this case she clucked concernibly. Its family left with adult bird. The two birds now flew east 150' and all was quiet. Then they returned and continued their clucking for some time. After eating lunch on 1/2 hour later stepped over to where I flushed the first family and flush 2 more young birds ~~which~~ who had remained there for 1/2 hour. While eating noted a sparrow hawk favoring a certain tree on ridge to west and would always return to it. Later discovered that it had a nest of young in a hole 12' above ground in a dead Conifer tree. Grasshoppers present. The sparrow hawks enjoy flying about the cirques. Left lunch grounds at 1:46 P.M for divide and ridge leading to rugged peak. At the divide a prairie falcon flew by. The sparrow hawk attacked it in close pursuit Arrived at divide at 2:10 P.M. Here one can hear a few Catellus. Continued along ridge to top arriving at 2:30 where one can see down into the next cirque. This cirque is a very interesting one being long a straight with out the abrupt successive drops or brinks which are associated with cirque. This cirque Canyon shows the gradation of zones and at its upper level is found likely Phenacomys + Clethrionomys habitats. Many

interesting topographical features of these → cirque and of the country to the east can be studied. Several seasonal levels can be found in N. fork of Hobble Creek. Continued west along ridge. at 2:45 arrived at small isolated rock slide issuing from ridge. This ridge is beautiful garden of wild flowers and make one conscious of walking among them. The entire south side of the ridge to cirque floor is clothed in flowers. Found a group of Meloidea beetles here. Considerable porcupine gnawing of bare of the Pinus flexilis, namly, however, at the base of the trees. At divide at 3:00 P.M. Just before reaching the divide one finds a rocky section of the ridge where many deer have bedded. Such a place make for easy escape to the north in timber below. At divide can see 2 nutcrackers, 1 Eutamias umbrinus, Townsend Solitaire and deer tracks. Some Douglas fir (?) 3 feet in diameter. Engelman spruce in canyon ∨ Cirque to north. a whistling flycatcher called here. Marmot calling below to the S.E. Evidence of burnt logs. Hummer passed. The terminal moraines in cirque no 1 are very interesting and if examined closely enough will no doubt add to the cyclic nature of glacial recession. From this interesting divide dropped down into cirque no 1 towards largest ∨ lowest spring. 3:25 P.M. Brink of rock slide. Heard 2 marmots and 1 pika. These two forms are decidedly rare in occurrance in such typical habitats as I have experienced during travels today, at least they are not making themselves know. Their occurrance is not to be compared with the populations found on Mt. Timpanogos. 2 nuthatches called continually. Desert varnish on moranic effluence indicating oldest positions. An approaching spring started two Rocky Mt Hairy Woodpeckers calling. These birds continued calling vigorously and followed my movements for the next 20 minutes keeping in close touch and calling so nervously that their presence was almost annoying when one has the intention of walking unnoticed and unheralded thru the conifers. These birds were first met up with in dwarf Engelmann spruce and large conifer directly above the spring. a Utah Jay was also found associated with them. Arrived at spring at ~~P.M~~ 3:40 P.M. The Clark Crows still calling on divide to the south. This spring, I estimated would flow at this time of year about a gallon in seven seconds. It issues from the base of the slide and flows 40' in a typical spring channel and then disappears in ground. Its old creek bed continues on and is no doubt used during the earlier part of the season. The mertensia is the only conspicuous flower in blossom. The conifer growths above spring appear to be ideal habitat areas for both the Clethrionomys and Phenacomys. being dense and considerable undergrowth of dwarfed conifers. The old terminal moraines north and west of Spring in main cirque are now covered with soils and are supporting stands of conifers. Left spring at 3:46 P.M with the intention of going out to north end of rock ridge to the north. Across the open flats saw 9 Citellus. One large and conspicuous group of elderberries in blossom 40' x 15' some 60' N. of Spring. Other smaller patches

also present. → 400628-114 One patch 4" elderberry among conifers supporting 6 Citellus. They ran in all directions on my approach. The two Hairy Woodpeckers are still following. One western Tanager following the woodpeckers in curiosity. at 4:00 P.M. the Hairy left and return to Spring but they still were calling, made surprise approach on a Goshawk which was on the ground. It left at 20'. Another one on divide near this one. It left also at 20' and sail over the divide thru the conifers. This divide is the lowest point on the north extension ridge. Followed along ridge and reached highest point at 4:20 P.M. This ridge is in the main a rocky one with Pinus flexilis growing on the most rocky & favorable parts. Green ~~lichen~~ lucken on rocks on ridge proper while on slopes and sides is practically missing. Also has been observed on several occasions today. The Siberian Juniper, Cacnothus, & Oregon are the most conspicuous and dominant plants on ridge proper and are found growing among a rocky situation. One excellent patch of Oregon grape

10-6-28-40

as one starts up this ridge. Observed several deer beds on the west trending ridge. These beds were placed in a most precarious position among the gnarled pinus flexilis and rocky ledges. Such a position assured protection from north approach. Rocky ridges are preferred as bedding grounds both inaccessible approach on at least on side. The areas examined meeting these qualifications generally have either the north or west approach blocked and exposed or near brink where wind blow. From one of these fresh deer bed down west ridge from top, took picture (10-6-28-40) showing a typical glacial canyon with characteristic talus and associated vegetation. This canyon is know as Shungle Mill (?) Canyon. This canyon suffers severly from periodic snow slides that rush down from either side of the canyon. The accumulations from these slides or they could be caused by terminal moraines make this canyon one of a series of ascending steps and flats. The only spring in this part of this canyon is near its mouth where larger aspen trees end and small snow-slide effected aspens begin. Left Top and returned to divide by 4:40 P.M. From here trended west and thru conifer timber. In timber deer tracks present, some imprints sliding. numerous diptera in air in light rays coming about 5' to ground. Good signs of Tamiascurus. In this canyon at lower end just as drainage escapes over the brink is a small lake bed which is probably used during early spring runoff. no vegetation is found on the surface of dry mud. Burnt area to the east. In this valley one finds the elderberry & Mertensia dominant. Measured one Pseudosuga which was 5' in diameter at 3' height. Feathers of Dusky grouse, probably a kill. Have noticed at different places whole sections of skin and feathers associated with the receding snows. 4:59 Citellus active. Niggerheads patchy but numerous. 5:00 P.M. Citellus armatus active. when (cit.) is used as abbreviated it refers to Citellus armatus. Group of 14 deer

conifers. 5:01 Ateller, ~~Kgld~~ Kinglets and Chipping ← Sparrow calling → 5:02 Cit. and nuthatches calling. 5:04 Cit. calling. Arrived at spring at faulted rock talus terminal, water flowing. a Pika calling 50 to east of spring. Spring with 210 feet of running water before stopping. Continued west to last Spring. I shoked an adult Dusky Grouse and 1 young. The young are filtered down three the branches for 8' before it finally came to rest with a more substantial footing. 5:20 Cit. 5:21 Cit. 5:22 P.M 3rd spring with running H2O. Found 1 adult grouse and seven young about 5 inches in length. These birds were either drinking or feeding among the damp vegetation along the course of the running water. a Pika called in talus slopes above. 3 edged scirpus & Juncus grass in floor of canyon along stream. Continued to the 4th and last spring. no water present in this spring at this time. Dw dwarf conifers show bear a boring beetle in dead limb. It sounds much like the squeek of new shoes. 2 white Cr. Sparrows in dwarf conifer acting very nervous. From here continued up to uppermost Cirque. no outlet to this portion of cirque because of terminal moraines. no evidence of spring here. except water from snow bank. arrived at divide at 5:47 P.M. 2 dusky grouse left divide with apparently no young. nutcracker associated with divide. Crossed upper Cirque no. 2 to ridge leading down to station no 2. Marmot call as I passed. ~~Upp~~ upon arrival at ridge found the same usual congregation of birds including the W. Cr. Sparrow, Clark Crow, flicker, Cit. Tamias-cciurus and other smaller birds

6:05 P.M Hummer, cit, siskin, G.T. Towhee, G.H. Juncos. The Juncos still at same place as observed this morning. Clark Crow calling continually as I descend this ridge 6:11 Cut umbrinus. 6:11 ♀ Cassin Finch singing. 7:14 Head of clearing as ridge drops more abruptly. Arrived at camp at 6:23 P.M with the usual birds present as Kinglet, chickadee, hermit thrush. These birds are invariable found in this timbered pass. Set fire and while waiting for a cooking fire step-ped up the ridge to the north a short distance and recorded a view of the cirque wall of cir-que no 1, the intermediate ridge and cirque valley no. 2. Lights at this time of day are most sever. Sun off the high ridge east of cirque no 1, directly east of station no 2 at 7:28 P.M. Temp. then 64°F. The Thrush, probably the and. H. Thrush, commenced singing at camp at 9:33 P.M. The sun lingered on high peak of the above picture and finally left at 7:41 P.M. a great horned owl called just north of camp at 7:45 P.M. Even as late as 8:00 P.M heard a hummer pass by temperature then 63°F. Retired early. Deer active with intention of crossing pass during nite. Mosquitos active for first time on trip to the extent of being annoying for the best of sleeping.

12-6-28-40 (11-6-28-40 in General area?)

— 12-6-28-40

Continued: 400629-116 6-29-40

Temperature at 7:47 A.M = 62°F Skies clauded for first time. Dusky grouse drummed from 7:30 to 7:40 A.M in cirque no. 2 just east of camp. Left camp at 7:52 A.M with the objectmue in mind of gaining top of high peak bording south of cirque no 1, hence south. W. along ridge to divide, hence north to Windy Pass, hence west along Windy Pass ridge to N.S ridge between cirque no 6. and 7, and then return. As I proceded up the Slaton ridge found an adult and her young 200' from same place as observed yesterday morning. She gave 4 clucks in a descending note. At 8:13 flush adult and young in same plase as yesterday morning. They were within 50' of spot where flushed yesterday. They flew as of yesterday also. The adult had a squealing note as well as her usual cluck. Arrived at top of Slaton ridge on Rock Conyon - Windy Pass Ridge at 8:16 A.M. At 8:25 A.M started up steep incline of high peak. a ♂ & ♀ deer left and proceeded up ridge one continuing directly up ridge while other one crossed face to the south. Numerous tracks in crude ridge deer trail. 8:53 A.M. Took picture no. 1-6-29-40 of the uppermost cirque of rock Canyon with Provo peak at right hand side of picture. A flicker sailed down ridge from top with closed wing and the speed of a bullet. nor did it let up until far below when it had gained a most unusual velocity. 9:00 A.M

1-6-29-40

Three clark nutcrackers arrived from the south and let on ridge. momentarily and then continued east down into Cirque no. 1 below. 9:06 A.M. The upper limits of the peak on the west exposure is characterized by dwarfed conifers. The Pinus flexilis is conspicuous with forms of the most grotesque degree. The Abis concalor (?) or lasiocarpa mats the ground making some area unpenetrable. nearly all forms of conifer growth obey to the command of the wind coming from the west. Some abies are straight but small and branches on one side only. One would never effect to find in such a rugorous situation many deer but contrary to ones belief one find the entire exposure utilized by the deer as bedding ground. Some beds are completely surrounded & covered overhead by conifer entanglement and offering to the deer an exceptionally protected night home. Most frequently they choose the lee side of conifer patch for their bedding ground. However one can find them in most every conceivable position where it is possible to receive partial protection from prevailing west winds. Such a position is a

vantage point for detecting intrusion as well as offering ready escape. Am wondering if possibly there is fewer annoying insects here or possibly such exposure retain the heat longer into the night. Most deer were found in such position during stay in this area. One ♂ deer left such an area only some 100' away. I could clearly see it but could not hear it make its escape. It could have easily disappeared without my knowing it if I had not observed it in the act. 9:15 4 rock wren, very tame. A sparrow hawk hovering on top but find no grasshoppers active here. Arrived on top at 9:20 A.M. The most characteristic bird found on top is the rock wren, there being 6 or 7 there. Other birds observed while on top are: G.H. juncos, Pine Siskin, Clarks nutcracker, Townsend Solitaire, Sparrow Hawk, Chipping Sparrow, Swallows (? sp). Golden Eagle. mosquitoes, butterflies in abundance at highest point, Bluebirds, (summering bird) and other smaller diptera and insects. From top took two pictures of the surrounding country. Picture no. (2-6-29-40) directed to the N.W. showing the east drainage of the cascade mountains and windy ridge. The bareness of the upperlimits of this area is evident from this position but when one is on the cascade mountains and look back toward this direction one finds an entirely different set-up. concerning the conifer. distribution. It is found that the east sides of these ridges are relatively bare on the upper levels or altitudes while the west exposure support beautiful stands of timber. One generally thinks that the North and east exposure generally support the timber. Many geological and floral aspects present themselves in this view. Picture no (3-6-29-40) is directed south from peak at the east side of the Provo Peak range (4a-6-29-40 in general area ?) at the peak east of the largest and second from uppermost cirque of rock canyon. Nopleton mt in background. The abruptly dipping beds to the east are very noticeable. 10:40 A.M. Far below on 2nd ↓ highest knowl between cirque 1 and 2 on lower medial cirque ridge could see a buck leaving same point as frightened from yesterday at about 9:40 A.M. The securely walked down ridge or rather up ridge but down hill to 1st knoll where it reclined

2-6-29-40

3-6-29-40


STATION
2

in bedding grounds for a few minutes and then it left again down hill. W.T. Swifts occasionally flew by. Observed a flicker nest 180' down and 150' east of ridge that I came up this morning. Few citellus armatus called. Left top at 11:45 A.M and started down ridge S.W to divide. 11:50 Golden Eagle flew over pass about 300ft below high peaks and hunting near the ledges continued south. Had lunch at 11:55 to 12:55 at base of dense conifers. Observed several burned trees with the burned area down to a certain level below which was found an area untouched and wondered if by chance snow could have been responsible in checking advance. The path along here is a very silent one and used by deer. 1:00 P.M Two deer left to west; one with horns as long as his ears while the other one had horns twice as long as his ears. at first group of conifers. These deer carried their heads in a most dignified manner. 1:05 citellus called. 1:10 P.M ♂ bluebird in nest in old burnt stump 6' high from ground, the hole on leeward side facing east. Arrived at divide 1:15 P.M. Flowers east divide. From here can hear W. Cr. Sparrow, Sparrow Hawk, Rock Wren, Clark Crow, Pine siskin, G.T. Towhee, Citellus and chipping Sparrow. In cirque canyon to the east is situated good trapping country for Cleithrio. and Ochens. many deer beds on divide Lakes dry but bottoms damp and muddy. Successive Terminal moraines ideal for study. a few feet west of divide jumped a buck deer which ran east down over precarious axels into cirque below. It had a long course in head of it and while it worked its way down and across the moraines it was very cautious and deviated several times from its course. During its entire retreat it would continual shake and lower its head as if troubled with its horns which were in the velvet. They no doubt were very sensitive to the jumping movement of the deer. a few marmots called in east cirque. Left this divide at 2:15 P.M and trended north across broad mountain side to comp no 2 ridge or Windy Pass ridge arriving at 3:00 P.M Found the sidehill crawded with deer signs activity & trails. Continued down ridge to west arriving at lowest pass on Windy ridge at 3:14 P.M. P. Falcon flew by. Continued west to medial ridge between cirque 6-7 3:44 Eagle flew around cirques 5 and 6 Arrived at top at 4:05 P.M On this medial ridge in flat portion below top counted 18 deer bed. on ridge proper. Left here and returned. There is one cliffy spot on Windy ridge that can be avoided by dropping down around to south and then regaining ridge again. 3 marmot here at 5:00 P.M. On first knoll west of Windy Pass Proper took (Photo 4-6-29-40 of the general area) a picture (5-6-29-40) of the Provo Peak & Provo Cirque area. Beautiful flower study in foreground of Elderberry, penstamen, Castilleja, raspberry, artemesia and a umbelloid type plant. Would postulate that in high country, east wall of cirques, among long dwarfed conifer stands one would find a true deer heaven at this time of year. The dwarf stands on high exposed ridges are being consistently used by deer at this time

5-6-29-40

of year. Arrived at windy pass at 5:23. Theer 400629-119 unusual rock structure at first pass east of Provo Peak appears to be a rather which does not seem to carry thru. It is overturned and probably has a n.w. 5.8 axis. at windy pass on ~~east~~ north side at head of erasional gully to the right found a clay streak exposed by gully. It was a reddish clay with green inclusions superimposed by a yellow streak being rather granular. The red clay was very fine and wondered if the indians could have used it in their paintings and decorations. Applied some on note book and find it very cohesive and permenant. On knoll between windy pass & next pass to east found extensive badger diggings. Cirque no 3 with only on main terminal area. At badger knoll took picture (6-6-29-40) to the north with medial ridge between cirques 3-4 in the foreground. Long evening lights filtering thru range to west. On ridge at head of cirque 3 found the coyote tracks trending west. Fresh dropping of the coyote superimposed on the older ones. They use same area for dropping in many instances.

6-6-29-40

The amelanchier oreophila on this rock ridge overturned toward the north. a few Prunus melanocarpa niped in among them. The wild-life trail along here is well establish and should not be interfered with any subsequent road building. The coyote, porcupine, deer and badger consistently use it. 6:55 Falcon lit in dead tree perch on ridge ahead. 7:00 P.M Turning off toward camp ridge. Good time of day for picture of Provo Peaks. Grouse (3) adults left at one point. Stained dykes to the west. 7:23 P.M flock of 14 crossbills(?) 60' above flat portion of ridge flew by to the east and south. 7:23 P.M Dusk. W. Thrush started singing. Several nutcrackers flew up ridge but did not call. Camp no 2. at 7:27 P.M. Mosquates might be bad tonite. A darning nelle insect at camp. Temp - 8:15 PM = 65°F deer active during nite. Owl (G.H.) called 8:25 P.M.

6/30/40

Continued -

Mosquates not as bad last night as expected. Temperature at 8:30 P.M = 50°F, rained last nite. Left Camp no 2 at 8:43 P.M to return to Provo via Rock Canyon. 9:07 Coyotes called. Jumped 3 sets of grouse this morning. Nuthatches found low in trees. Tree swallows flying low. Arrived at top of ridge at 9:25 P.M. Remained on ridge to get pictures of storm clearing. at 10:15 the rain stopped and just before it stopped the white clouds began to form. These clouds form suddenly and leave abruptly so one has to judge the right cloud condition before it changes. One has only a few minutes of ideal picture taking during this cloud transformation. These clouds form low then work up and completely enshraw the mountain and then

400630-120

gradually → rise from mountains. ← The main canyons that traverse the Wasatch range as American Fork, Provo Canyon etc. bring in great clouds of mist which settle on the lee side of range. While the general cloud stratum is high the canyons will be choked with misty clouds. Picture no (1-6-30-40) was taken at 10:00 P.M with just a little sun faltering thru. The cloud mass forms on the east side of range and then in this instance travels north. This cloud dropped down from the pass east of this peak in picture with a suddeness that startles ones. The west side of the range is practically free of clouds. The clouds, as they approach the top of the ridges as along the top of the Cascade range or along the windy pass as is so well exemplified in picture (2-6-30-40), are immediately carried upward and back again into space. From the western prevailing wind. This picture no (2-6-30-40) taken at 10:20 A.M shows the later stages in the cloud formation. note how Provo Canyon is pushing in great clouds of mist which is far below the horizon of the general mass of clouds. The robins started singing after storm in emphasized degree. Observed deer in dwarfed timber between spring 3 and 4 in Cirque no 1. It was bedded down and remained so during entire stay here while clouds were being formed and reorganized. Watch a group of pine-siskin. They at first a pair would chase each other in top of tree and then as if activated by this demonstration the entire group would leave tree top and chase each other. When they fed on the ground they took no concern about the juncos, Cut. or rock wrens but these last named formed (Juncos & wren) became terribly excited at their presence. Clark Crows sound like jumpenJacks at time. The clouds at 11:45 have established a uniform base level at about 10,000' but clouds on Timp. & Cascades still a little irregular. Returned to Windy Pass and then left at 11:50 and trended south to head of Cirque of rock canyon. Across this exposure counted or heard 57 Citellus, 4 D.T. Towhee, 2 Brewers Sparrow. Otherwise there were very few birds. Polemonium common across this stretch. Arrived at head in talus slope at 11:44 and left cirque base proper at 1:00 The forms observed in this cirque are clarks Crow, chipping Sparrow, D.T. Towhee, rock wren, Kinglet, numerous + fresh deer tracks, marmot, robin, Citellus, Sp. Hawk. 2 Cut Umbrinus, and

1-6-30-40

2-6-30-40

Audubon Warbler. 1:05 Jumping off place just ↑SW of long conifer → on knoll. Continued down Canyon and arrived at Coral at last flat knoll in Canyon at 1:23 P.M. Started to rain 1:55 thunder cloud arriving from the south. It passed over in typical manner and just to the west but received good rain & hail. Trail brushy & decidely wet. At Guard rocks (cliffs) at mouth of this Canyon & there dropped over into next Canyon draining Provo Peak Cirque. Continued down to convergence of this canyon & the one I had been following down first. The erasional gulch is about 14' high and one finds it difficult to get out of it from here down to flats. at flats at crossover left gulch at 2:33, hence down to first left hand fork of Rock at 3:00 P.M. hence to mouth of rock at 3:30 P.M. In rock Canyon found the dragon flies in abnormal numbers and completely filling the air. Eagle flying around eagle cliff & nest on south side of Canyon at top of ridge mt. The growth in rock Canyon at flats is coming back in grasses and underbrush since sheep exempted. Old obnoxious weeds still at base of newly formed grasses. but gradually being replaced.

Picture (2-6-27-40?) inserted at this point to show returning trip at upper Cirque. Taken about 6:00 P.M from head of Station ridge on the 27th?. The recordings of this trip, as a whole, are more or less specific but generally during end of each days side trip they become selective to a certain degree. Notes are so recorded that summary can be made directly from them, as to numbers and dists.

(insert) 2-6-27-40

Printing poor on pictures in report.

Palmyra Park in Diamond Fork Canyon. 7/6/40

Drove up Sp. Fork Canyon to Diamond Fork to Palmyra Park. Observed 2 citellus lateralis castanurus (one with something in its mouth) running across the slate highway about 8 blocks west of Castella. at mouth of Large Canyon from Loafer Mt. They ran N.W. 1 citellus v. utah at mouth of Sp. Fork. 2 Cit. v. utah 2 blocks up Diamond Fork Canyon. At Palmyra found 8 nite hawks in the air above grove at one time; Elevated erasional floor levels conspicuous & numerous. Forms of cottontail, lazuli bunting present. Robin, Song Sp, Hummer,

For the following dates see insert a page 129

7-12-40	7-15-40	8-9-40	8-12-40
7-13-40	8-7-40	8-10-40	8-20-40.
7-14-40	8-8-40	8-11-40	

Mount Timpanogos. 8/29/40

Mary and I made circuit trip on Timpanogas commencing at Timpooneke Basin, hence up regular terrace trail to Am. Fork Cirque, From base in Upper American Fork Cirque made lateral side trip to west ridge and north terminal, hence to Emerald Lake and Hidden Lake Cirque, hence down regular trail to Aspen Grove. Entire stay in mountains 2 night and 2+ days Our grub consisted of food to supply 1 sack lunch, 2 breakfasts, 1 trail lunch and 1 supper.

400829-122

meals for 2.

Breakfasts (duplicates) 4 slices bacon, 2 eggs, 2 small potatoes, postum, sugar, 1/2 can condensed milk (small) 1/2 pt fruit

Supper. 1 can veg. soup, 1 pint fruit, bread, butter, jam, candy

Trail lunch. six fig bars, 3 choc. sq., 1 sq. cheese, bread, butter jam, pint fruit, can sardines.

Sack lunch. 3 meat, pickle, lettuce sandwitches, 2 bannas, 2 pieces cake, postum, sugar, milk,

The itemyed list for two is: 8 slices bacon, 4 eggs, 4 small potatoes, postum, sugar, 2 small cans of condensed milk, 4 pts fruit, 1 can veg. soup, 3/4 loaf bread, 1/4 lb butter, 1/2 pint jam, 10¢ candy, 12 fig nuten bars, 6 squares chocolate, 1 inch sq cheese, 1 can sardines, 3 meat sandwiches, 2 bannas, 2 cakes. These rations were formulated so that we would have a maximum period for mountaineering and a minimum period of cooking. The regular hiking equipment included articles such as tent, sleeping bags, cooking equip. flashlight, camera, binoculars etc. After considerable preparation and days of anticipation we embarked from the Ranger Station at Timpanoche Basin on the 29th of Aug. at 8:48 P.M. with intentions of making a late camp on upper terraces. The lower trail at this time of nite is indeed facinating. when the stars are shinning and glittering as if jewels in the black sky above. These apparent intensities, however, are not of sufficient strength to penetrate the aspen foliage to guide us along the invisable trail thru the grove. Our passage was dependent upon a knowledge of the winding course and of the feel of the trail. Regardless of how one may strain his eyes, the path we followed through the aspens was invisible. As we left the dark aspen forest and crossed openings & traversed clearings the star rays disclosed a faint trail. We were in a visual sense, disassociated with our environment. Under the enchanting spell of such an invironament we kicked along without realizing our visual unconsciousness until we were forcefully bounced back to reality by the unexpected signal flurry of a deer as it broke thru the willows along side of the trail. We were then impressed with the fact that one never appreciates the part sight plays in our make-up. An incident occurring later emphasized our point of thought as we experienced an unusual degree of fear when 5 savage sheep dog fiercely heeled us thru the property of a sheep camp. This instability of the mind of fear which was so ~~evant~~ evident with the dog episode, was properly associated with the lack of coordination of our site with the intrinsic reality. There was such an intimate and close feeling of piercing canine teeth on our legs that sight was not necessary. Such is just a thought in appreciation for those nocturnal forms of animals which have so perfectly adapted themselves to dark situations. and why many carnivorous forms take advantage of the veil of darkness. One is indeed impressed with the fact the the specialized sense organs of smell & hearing are directly associated with site. It may even be that mans loss of special senses has come about by overcoming the darkness factor with a substitution of fire and

logical reasoning which either preceded or followed 400829-123
night traveling
was fascinating in some respects but uneventful in other respects. Arrived at Badger Flats at 9:06 P.M. The pika on the east slopes from this flat called as we entered although a block and a half away. It called frequently while we were in vicinity. It call at night sounds more weird than when offered in the daytime. Night or day, it is always found in these rockslides and never fails to let one knowx of its whereabouts. Sheep herd on Basal cirque. From Basal Cirque continued up regular trail to first terrace above floor of cirque. Pika called frequently as we passed along the more favorable rock slides. Reached distination at 11:25 P.M This camp site is located just east of rock slide area on first terrace flat. Upon

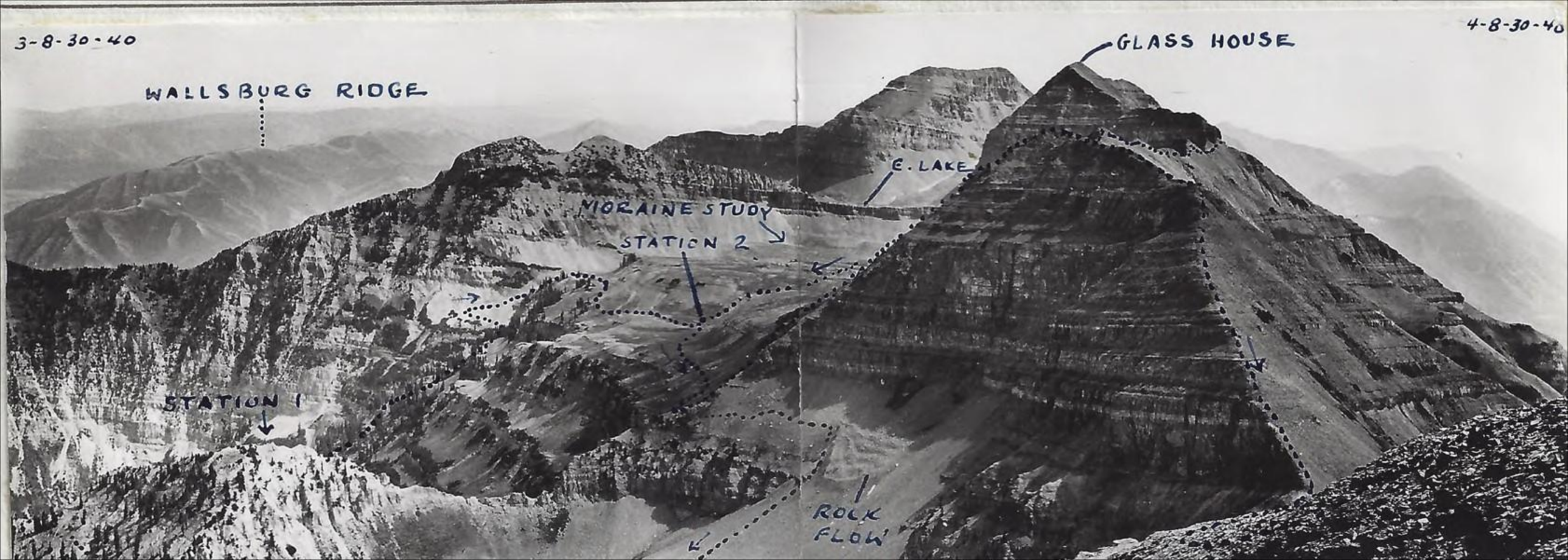
our entrance to our terrace camp, found it preoccupied by a rightful owner. A large porcupine had been attracted to the abandoned campsite and indicated mans reaction with native animals. Fortunately we were spared the job of constructing and organizing a camp, as we merely occupied this abandon sheep herders camp. The perfect bed of conifer boughs proved to be the main attraction. Our problem then was to merely throw out our sleeping bags upon the boughs which turned out to be far superior to any pneumatic & interspring mattress. The sack lunch, which is always prepared at home saved prolonging a nite that was otherwise invested in good sound sleep & rest. We both fell asleep anticipating an eventful marrow:

Timpanogos (continued from above) 8/30/40

Sometime before dawn, were awakened by a wondering deer that passed camp only 10' away. The effective manner in which a deer has of startling an individual into a stable fright was evidence, particularly when startled from a semi-unconscious slumber, an excellent alarm clock but not quite as subtle. Up at 5:30 A.M. Temperature at 5:45 A.M = 46° F. A few minutes later (grey dawn) the sky above was suddenly charged with a most intense and brilliant color. These colors were transitory and soon faded away with the contracting & increasing intensity of the general advancing lits. I have wondered whether these gorgeous lights are merely subdue as the suns rays overwhelm the sky or whether there is actually a color change. These morning lights, are in effect, much like a sunset in duration & intensity but colder in tone. The pika, Tamiascurus, W. Cr. Sparrow,

3-8-30-40

4-8-30-40



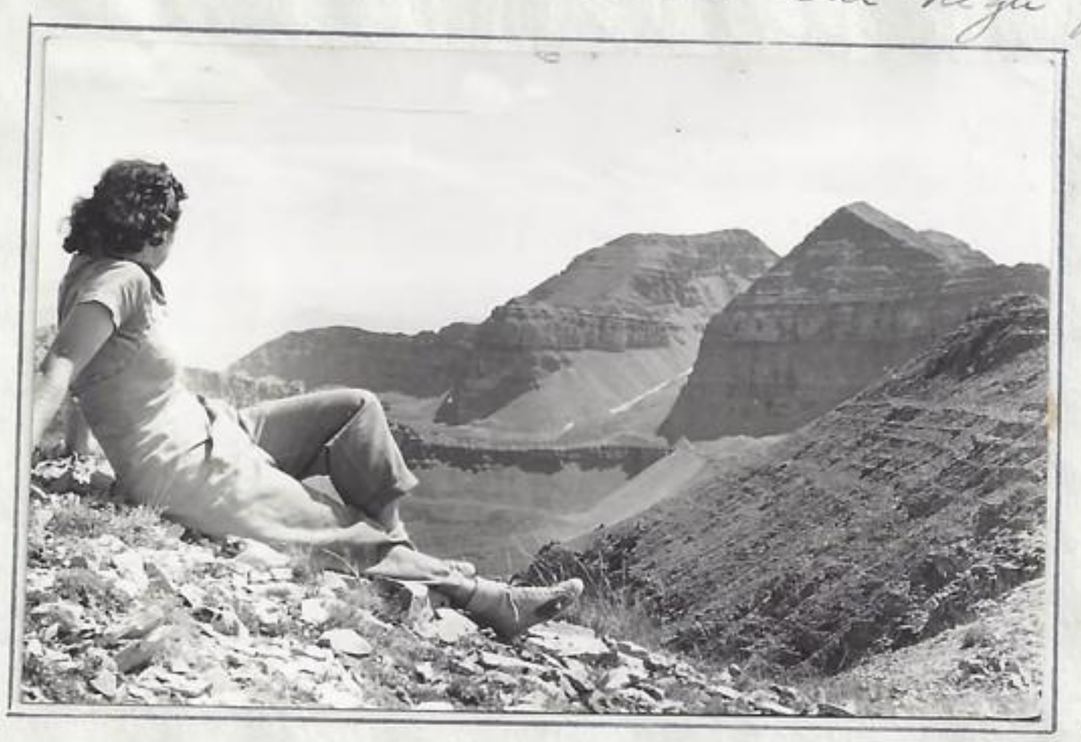
400830-124

and G.T. ↘ Towhee were ↗ the first signs of animal activity near camp
The first birds observed were six pine siskin which flew west at 5:55 A.M
A single flicker called at 5:58 A.M. There was very little bird or animal
activity up to 6:00 A.M. After then the terrace showed a general and
gradual awakening and increased proportional to the morning time.
While mary prepared breakfast went east along terrace to main
gulch. On the other side of this gulch is a spring which at this
time of year supports a few drops of water and saturates the surround-
ing rocks in immediate area of water. The entire spring area is only
a few sq feet. If one is patient and collects from several of the
deliberate trickles, can acquire enough water to drink, wash and
cook with. While at this spring 20 pine siskin made repeated
attempts to lite while the spring was under my management. They
retained their group formation thruout their endevors. Returned
to camp and breakfast soon over by 7:30 A.M. At this time the
insects were completely occupying the the sun warmed air on the
narrow flats of these terraces. The following were heard or ob-
served at 7:30 A.M: Townsend Solitaire, pika, R.C Kinglet, Tamiasc-
urus. They called at same moment. Other forms heard generally. After-
breakfast took picture no (1-8-30-40) of Mary and our partially packed
packs. Tumpsuneke Basin can be seen far below. Mills peak and
Granite range (east end) observable in distance.

1-8-30-40

Completing our packing left at 7:58 A.M
with our destination at upper springs at
brink of the Am. Fork Cirque where we were
to establish our our base of operation
for the west ridge ascent. While gaining
side to trail found a pika nest of russian
thistle which is, of coarse, a plant that is not
native to the mountain. Found this plant to be
generally distributed upon this mountain. At
8:05 A.M an eagle lit in a tree on the upper
limits of the terraces. Arrived at brink of
cirque at 8:05 A.M. The usual birds were observed
along the trail of the terraces with an unusual
and variety of hawks. This situation was
nodoubt a migration as they were continually
in evidence. From brink continued west to springs where we soon
put camp in order and prepared to leave for the west ridge. This station
no 2 is situated on the last brink terrace as pictured in 3-8-30-40.
Put up tent at uppermost spring which was flowing with normal capacity
and cold. It fed several ponds on meadow of this terrace. Beetles num-
erous in ponds. Left station 2 at 10:30 A.M and planned on spending the
rest of the day on the west ridge and north terminal. Followed as indicated
in pictures 3-8-30-40 and 4-8-30-40. From camp continued west and arrived
at head of a new erosional gulch at the east side of the Upper Timpooneke

Cirque. We stood for about 5 minutes here and inspected the Cirque below. as we started again a large buck sprang out of the dwarf conifers not over 30' away. It had remained 'frozen' this entire period. Only a old wise buck will duplicate this act. It must have realized that it was in a predicament and stood a greater chance of escaping if it remained concealed in these sparse conifers. Its only escape was to the west across a most precarious rock slide. It finally arrived at a safe haven but only after crossing over and down across a most treacherous course. It seemed so remarkable that a deer could traverse such a surface of talus boulders and sliding rocks. It pained me to realize why its legs did not snap completely off. This deer was no doubt one of the masters of the mountain as indicated by its large neck and mammoth antlers as well as by its manner of conducting itself. We had been following 2 sets of deer track to the point. From here we ascended the steep west wall and finally gained the top of the ridge. The course was steep & ruggid & coarse but we had no alternative. Crossed several patches of lupine in sky meadows near the top. From the top took picture no. (2-8-30-40) at 12:30 P.M. of Mary with american Fork Cirque, Glacial valley & Emerald lake in the background. The extent of the permanent snow bank can be seen in the glacial canyon above Emerald Lake. I would be a bit surprise that the snow bank has at one time been practically none existent. From the high point work N.W down ridge to point where it drops abruptly to the pass below. Left Mary at this point to absorb a little of the valley to the west with Utah Lake far below while I continued north to terminal. The pass is deep but soon had crossed it & soon on high peak looking down into the American Fork Canyon. From here the Granite range becomes subdue and has not the picturesque qualities as when observed from a lower angle. Deer track in evidence. I have found that this west ridge is regularly used as a game trail along its entire course. In those areas where the ridge intercepts soft members of the strathgraphical formation the marmots(?) have used them for their home, that is the softer material has allow them to penetrate into a ridge that is otherwise solid rock. A brecciated or gaudged fault served the same purpose. From the highest point on this north terminal peak took 2 pictures of the American Fork cirque and adjacent territory. These two pictures no (3-8-30-40) and



2-8-30-40

no. (4-8-30-40) 400830-126 ↖ when arranged ↗

as a panoramic, presents a most informative view of glacial action & cirque formation as well as structural and stratigraphical features of the range. Tumpoonche Basin in the immediate foreground, American Fork Upper Arque in middle and Emerald Lake & glacier valley in distance. If one were to bring a road up to flat portion of ridge east of Basal American Fork Cirque and then send a horizontal trail to the cirque would be make a most unusual combination for either summer & winter hiking. It would place the trail at the cirque levels and then if they could be extended around the entire mountain at this same level would make a recreation area unexcelled with the higher peaks for those who chose to leave the regular trail and test their mountaineering technique. Such an idea would ~~be~~ not be in keeping however with the greater values that can be gained from a primitive & undisturbed mountain. The rock flow is interesting because of its isolated nature. The pictorial record is available so will not go into detail. On return to Marys position observed 28 Leucosticte at the pass. They flew in flock formation and from their actions could clearly see that they were truely a bird of the rocks and ledges. This observation was made at 2:20 P.M. From the divide continued up the south ridge to Mary. Left 2:48 P.M and started down the ridge toward the Glass House Peak. This ridge ~~to~~ make a most delightful course because of its high position with steep side and with such a commanding view on either side. At 3:22 P.M took another picture of Mary no. (5-8-30-40). The perpendicular walls and cirque below off an eloquent setting for the 'Bee of the Wasatch'. Emerald lake ~~one~~ can be seen at the end of the disconnected snow bank of the glacial canyon. The rock flows and talus have placed an encroching accumulation upon the pleistocene topography and now cover the old original cirque wall. The talus slope to the extreme left of picture shows a renewed activity. Note the fault on the north end of the Glass House Peak which nearly parallels the present slope of the west exposure. The true pyramid profile of several peaks would suggest a fault slope but am of the opinion that they are slopes of gravitational repose because of their sameness in degree of slope.

5-8-30-40 (see page 126.1 enlarge)

Contenued south along ridge to junction of main trail, hence back to Camp via cirque floor arriving at 4:50 P.M. The most noteworthy experience today was the unusual numbers of hawks on the air. They were contenually moving south along the mountain and nearly always present on the air. They included the following species: red. tail, swainson hawk, eagle, marsh hawk, cooper hawk.

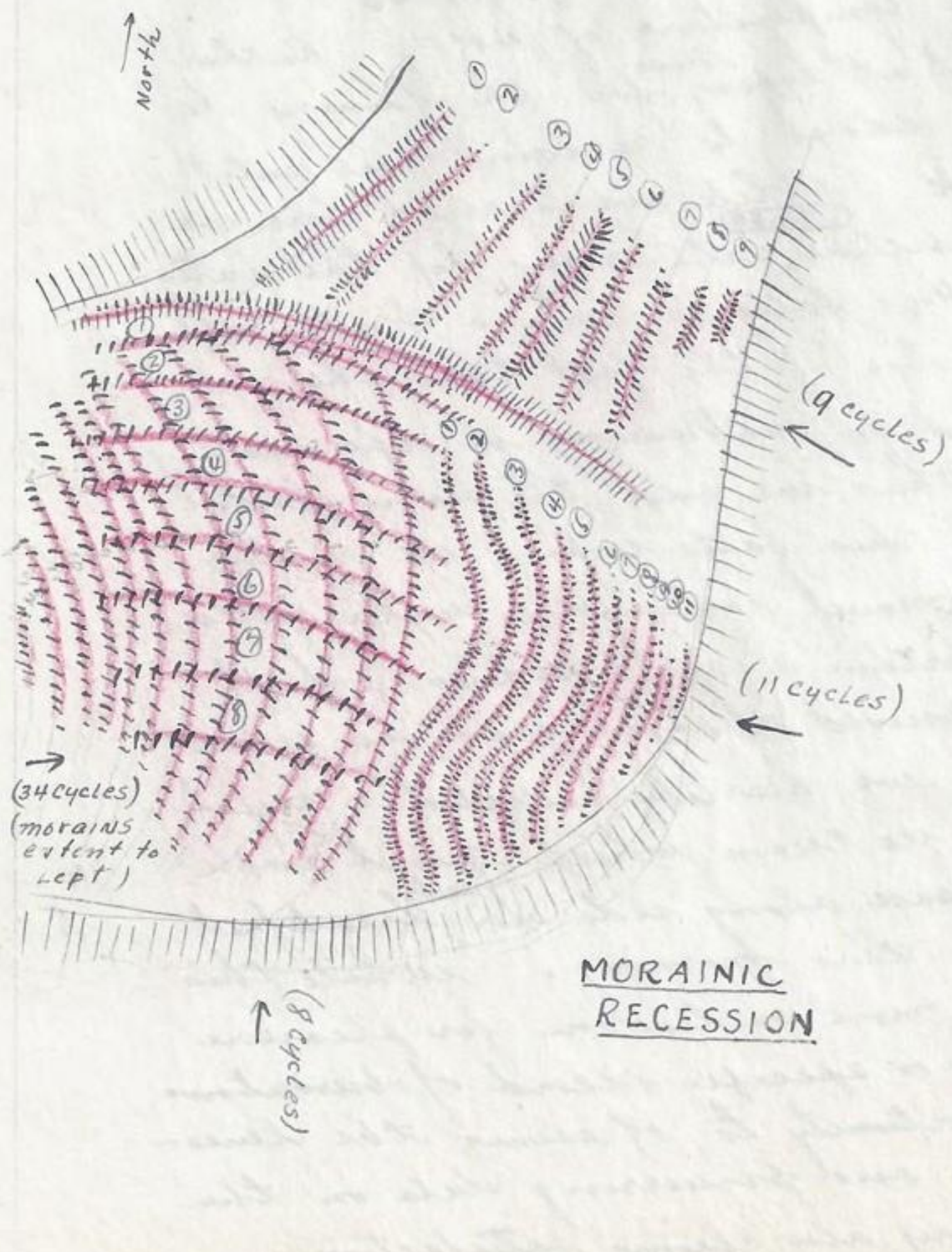
5-8-30-40 TWB

400830-126.1

sharp-shin, falcon, Cooper's hawk, sparrow hawk and other unknown. There seemed to be more irregularity and confusion at the American fork cirque as compared to the west exposure slope where their movements were more directive. This evening had an early supper and then retired. ofter a hard climb this afternoon. While on top today at about 12:30 P.M. noticed that the tent below was blowing vigorously while on ridge there was practically no breeze at the same moment.

Timpanogas (Continuation of above trip) 9/1/40

up at 5:06 A.M. The early morning lights were just like the preceding morning but our new setting here added an element that brought upon an emphasis. Our position reminded one of the far north upon the treeless expanses. The cold morning air made it all the more realistic. This artic feeling was no doubt due to the fact that as we looked to the north the meadow horizon carried directly out into the infinity of blue grey sky without our regular and normal view as ascending foothills and culminating on a mountain. Breakfast over and ready to leave at 6:06 A.M. Temperature of spring 42° F. Sun at camp at 6:10 as we left. A red tail (?) flew by at 6:08 A.M. Followed regular trail and arrived at divide of American Fork Cirque & Emerald Lake at 7:00 A.M. At this divide examined the original glacial edge of this abrupt divide floor but failed to find any striae. Considerable depasit was place upon the original floor. From this point very crudely and diagramatically recorded the moranic deposits in the floor of the cirque below. These receeding snow banks placed their record in floor of cirque from several directions, some superimposing upon one another. It appears as if there might be recorded a 9-10 cycle. This area should be more carefully studied. A similar moranic deposit issues from the glacier canyon above Emerald Lake. One can readily see that this glacial canyon drained into American Fork Cirque instead of its present drainage into the Hidden Lake Cirque which in turn drains into N. Fork. of Provo river. Such a picture as this could be correlated with the shoreline cycle of Lake Bonneville. dropped over to Emerald lake and found it to be 18 inches below its normal water mark. on rock cliff on east side. no snow entering. Crown Lake went last on bench and as we peered down into Hidden Lakes we saw a ♀ deer feeding



MORAINIC RECESSION

490901-128

ow sidehill → and fearless. ← From near here took picture no (4-9-1-40) of the abutment above Emerald lake and the west side of the glacier canyon with its perpendicular wall of limestone. The glass house can be seen on the negetive of this picture but not included in this picture. Left lake at 8:25 A.M. near the lake saw a Citellus l. castanurus and some pika. It was a rather peculiar thing but the only pc marmot observed or heard on the entire 3 day trip was seen sit the base of the talus in picture no 1-9-1-40. They nadaubt are in early hibrnation or late aestivation. At the brink of the Hidden lake Cirque took a

1-9-1-40

silouhette picture of Mary no. (2-9-1-40) looking down over the terraces leading down to aspen Grove. mt. Elk Peak on right. Left Hidden Lake Cirque at 9:00 and arrived at Lecture ledge at 10:00 A.M. Stopped at the main fall (2nd one up canyon) where we paused for an hour to partake of its eloquent beauty and refreshing spry. The temperature of the water at base of the falls was 48°F while the water from the numerous springs from the sides 20' from pool of falls recorded a temperature of 40°F. Rather than wait at Aspen Grove for the family to arrive we chose to remain here until 11:00 oclock. While we tarried here we

2-9-1-40

prised a picture (3-9-1-40) with mary by the water falls. This falls to her is bridal veil falls in lue of the fact that she was to be joined in matrimony in the near future. Thus we add the name bridal veil falls to this falls which we realize is a new & novel name for a water falls, at least within a 10 mile radius. Left here and arrived at aspen grave as scheduled where we heartely accepted a rayal feast plus ice cream which found ample lodging space along side our early breakfast of 5:30 A.m this morning. While this trip was more or less one for pleasure

3-9-1-40

did not attempt to keep an accurate or specific record of observations but feel rewarded in having the opportunity to observing the ecosituate, witnessing the hawk migration and procurring data on the hibrnation dates of the marmot. Mary also claims satisfaction.

Observations of Colors on mts. 9-2-40 400902-129

Progress of autumn color change on mountains east of Provo. No colors above Maple flat on the 28th of Aug. but started red on the 29th & increased steadily until 5th of Sept when they were general and intense. Aspens still green but showed yellow fringe on peripheral edge about 2nd of Sept. above Maple flat. Colors first observed below maple flat about 1st Aug. Colors below fault line started Sept 2. but red above as early as Aug 23. The fault line is below maple flat some distance. Maples below Maple flat mainly Provo River.

9-4-40

at Weldwood river steaming at 8:30 P.M. after dark and following a heavy rain storm. The river below North fork to Mouth of Provo Canyon was muddy except a clear stretch at end of still water above Donnans Resort. Above entrance of north fork stream river clear. The north fork had polluted the entire Provo River Course.

Inserts: 7-12-40; 7-13-40; 7-14-40; 7-15-40; 8-7-40; 8-8-40; 8-9-40; 8-10-40; 8-10-40; 8 11,40; 8-12-40; 8-20-40.
Entered 9-3-40

7-12-40

Five day trip to Grandaddy Lakes in Uintah Mountains; members of Party consisting of a patrol of 5 scouts of Troop 51, Provo, Utah. Dan Bell, Bert Snow, Robert Free, Dwight Taylor and myself. Left Provo at 6:30 A.M and arrived at Savages Ranch at 10:00 A.M; the distance measuring 82 miles. Equipment and food as usual. Never fail to bring a good number of flies for fishing as when younger member fish from the pine bordered shores, they invariable loose a great number. Left Savages ranch at 10:20 A.M. Mouth of Canyon at 10:40 A.M. Head of steep grade at 11:30 A.M. Stopped for dinner at 11:50 A.M and started again at 12:17 P.M. Splash Lake 1:14 P.M. From this point on the going ok. Arrived at Grandaddy Lake late afternoon and set up permanent camp at Grandaddy Lake. As this trip was one with fishing and a general enjoyment of the country did not take too copious notes. Soon had supper cooking and camp completely organized. Tents constructed with mosquito proof windows but found that the mosquitos were not of any concern.

7/13/40 (Uintah trip continued)

Spent the day at Shadow Lake. Fishing excellent for scouts. Outlet creek with many small fish about 4-7 inches. Meandering meadows above Shadow with few larger fish. These meadows represent the remains of a former lake which has filled in completly. Conifers have not yet invaded area. The select point to fish is Shadow is at entrance of creek from the S.West, particularly among the outer edge of the water lillies. Picture (1-7-13-40) taken in the afternoon shows the lake. View from the N. west edge of lake shooting south. Several nice ones were taken around waters where dead branches protrude from water surface. Picture no (2-7-13-40) taken at Camp at edge of Granddaddy Lake. 5x7 floor tent in foreground. This tent has proven very practical on many occasions. Being light, was about to pack along. Will be interesting to see if these same trees are still preserved on later

INSERT 400903-130

years when man has used the area for his recreation grounds. Many man made scars already exist in this supposedly primitive area.

1-7-13-40

2-7-13-40

while the fish are not as large as those found in the Grandaddy Lakes they are greater in number, however several 15 inches were taken from the lilies on west side of Shadow.

7/14/40

Today I spent with camera on mountain south of Grandaddys. This mountain offers an excellent vantage point for panoramic of the Uintah Primitive area to the north. Pictures no. 1-7-14-40 2-7-14-40 3-7-14-40 4-7-14-40 5-7-14-40 6-7-14-40 when arranged in a panoramic perspective give the following results on opposite page. The most characteristic birds upon the mountain were the Leucosticte atrata and Anthus spinoletta. Some areas of top flat and parklike and many points with mountain peracture with traversing difficult. Talus slope up from face above Grandaddy rather difficult due to possibility of rock gaining movement.. Second Panoramic of Grandaddy Lake proper pictures 9-7-14-40 and 10-7-14-40 constitute this view. Belay Lake appears to be closely associated with Grandaddy. Baldy mountain at the extreme upper left hand side of picture in distant sky line. One is impressed with the black expanse of timber and the possibilities of it being wiped out by the fire of some careless camper or fisherman. Much more country remains to be explored.

9-7-14-40

10-7-14-40


CAMP!

INSERT 400903-131

5-7-14-40

04-41-7-5

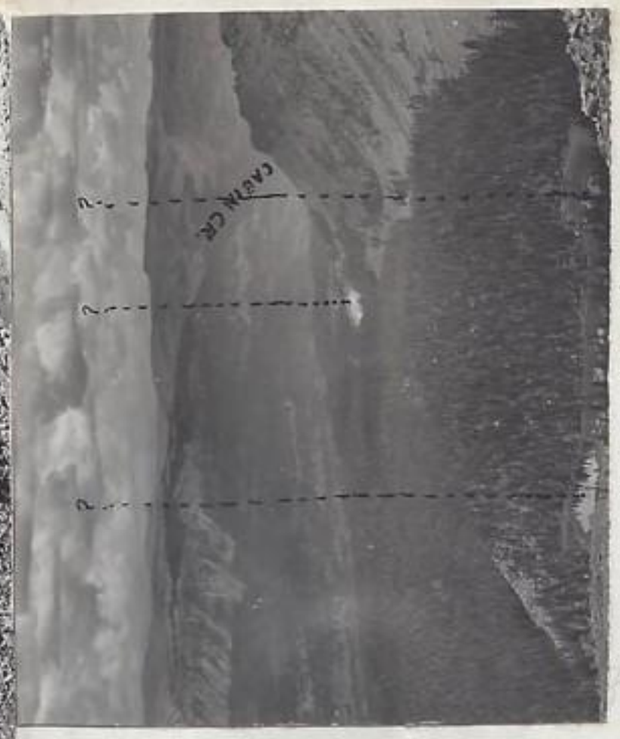
3-7-14-40

04-41-7-6

2-7-14-40

04-41-7-7

1-7-14-40



04-41-7-9

04-41-7-8

Picture no. (8-7-14-40) so of Dwight Taylor posed on ledge with Grandaddy lake below. Betsy lake in left center of picture. Note the remnant snow bank on mt. Agassiz in the distance.

List of Birds and Mammals Observed on this 5 day trip.

Junco caniceps
Pinicola enucleator montana
Perisoreus canadensis capitalis
Dryobates villosus monticola
Zonotricha leucophrys leucophrys
anthus spinaletta.
Hylocichla guttata auduboni
Carthylis Calendula calendula (Sub.s)
Flycatcher (large Conspicuous whistles)
Nuthatch (Sp.)
Spinus pinus pinus
Actitis macularia
Salpinctes obsoletus obsoletus.
Leucosticte atrata
Ladia curvirostra benderi (sub sp.)
Aquila chrysaetos canadensis
Turdus migoratorius propinquus
Hummingbird.
marmot
Pika
Eutamias umbrinus
Eut minimus Canadensis
Deer
mucfroga Columbiana
Tamiascurus hudsonicus ventorum.


Duchesne R.
(?)
Baldy mt.
MOHAWK L.
?
Betsy
CAMP
GRANDADDY LAKE
PINE ISLAND L.
?
SHADOW L.
?
HAYDEN
Kidney L.
AGASSIZ
Lost Lake
FISH LAKE 2
FISH LAKE 1
EAST
FORK
WOLF LAKE
?
DAYNES
LAKES
Rocky Sea Pass
?
FISH CR.
WEST
FORK
ROCK CREEK
EAST
FORK

CARTAN CR.

?

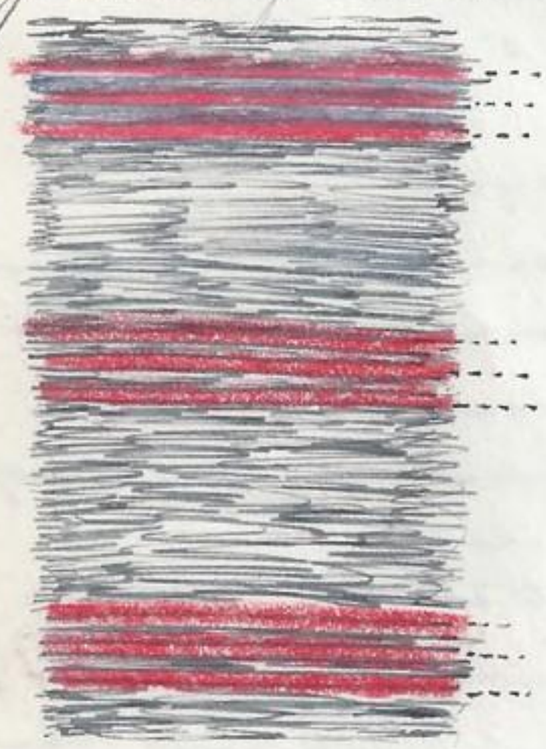
?

?

INSERT 400903-132

Recorded the water line marks upon the boulders along the shore lines of several lake. One frequently finds boulders in ephemeral ponds ~~or~~ rock after being drained take on this particular evaporation scale. Whether this scale has any cyclic significance I cannot say. About the only cycle that is so distinct and regular is the daily fluctuation, but am of the opinion that these chalk marks left upon these boulders represent greater periods of time than the daily fluctuation of day and night. The intervals between each chalk line is about one inch. One can readily note the regularity and cyclic arrangement of these lines. Each chalk line is made up of several smaller lines which give the line its width. Note also the 2 lines above the first distinct white line. From all the evidence gain can construct an average arrangement of these lines. They appear as follows. Red representing the white line and blue the rock proper. Some white lines are even more finely divided than is shown here. Took the measurements of these lines from a boulder in a dry nearly dry lake or pond bed above last large lake before divide. Its measurements are given on opposite page. The first 3 inches are very fine and irregularly spaces. The next 13" regular with chalk lines averaging 10 per foot. As these measurements were approximations cannot receive too great a degree of accurrancy of results. Some lines extremely finely arranged. Picture no. (1-7-15 40) taken the last day represents the Matly Crew after having been satisfied with all the good fishing that one could possibly hope for. As these fellows carried out several pounds of trout each they found the return trip with shoulder straps binding just as tight as the initial travel into this area. An occasion they will never forget I'm sure.

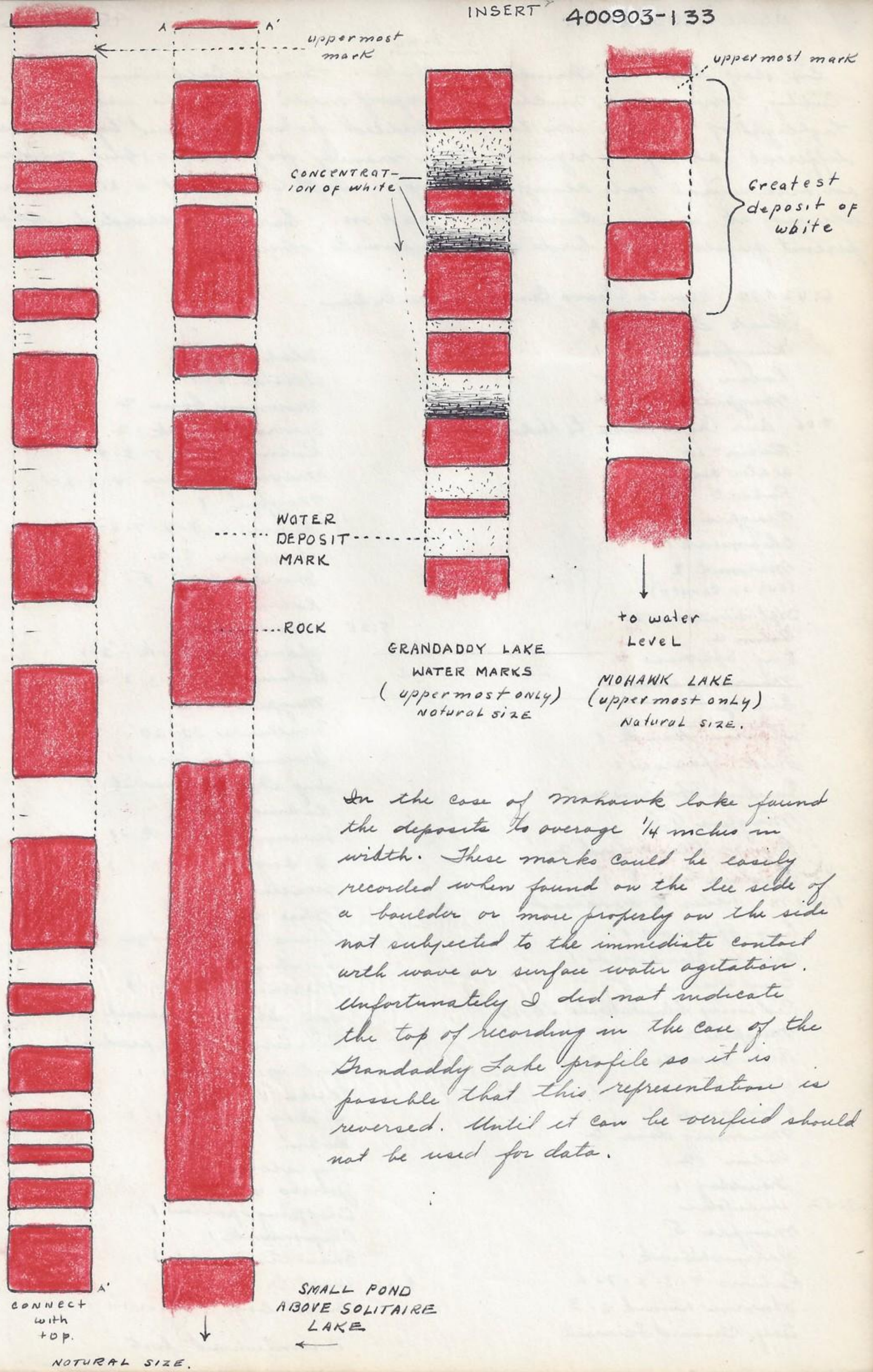
11-7-14-40



(Picture on left)

1-9-15-40

INSERT 400903-133



In the case of Mohawk lake found the deposits to average 1/4 inches in width. These marks could be easily recorded when found on the lee side of a boulder or more properly on the side not subjected to the immediate contact with wave or surface water agitation. Unfortunately I did not indicate the top of recording in the case of the Grandaddy Lake profile so it is possible that this representation is reversed. Until it can be verified should not be used for data.

INSERT 400903-134

8-7-40

Six day trip to Grandaddy Lake. Burnett Culbertson, Mil, Ray, Cubby, Mary, Dad, Mother and myself made trip. As usual the highlight of the trip was the unexcelled fishing supplied by the many different lakes of the region. Trip mainly for pleasure but made an occasional note along the way. Left Provo at 6:30 P.M. and arrived at Savage Ranch at 10:22 A.M. Enroute recorded the percent frequency of birds and mammals observed.

6:42 A.M. Mouth Provo Canyon to Deer Cr. Dam.

Rock Squirrel 2
Kingfisher 1
Robin 14
Magpie 4

7:06 Deer Creek Dam to Heber City.

Robin 10
Water ouzel 1
Rabbit 4
Magpie 1
Chipmunk 1
Marmot 2
(out of Canyon)
Cliff swallow 20
Robin 4
Eng. Sparrow 2
Mourning Dove 4
Eng Sp. 1
Sparrow Hawk 1
Lark Sparrow 1
English Sparrow 2
Magpie (13)
Brewer Blackbird 2
English Sp. 8

7:35 A.M. Heber to Woodland

Eng. Sparrow 12
Brewer Blackbirds 1
Eng Sparrow 5
Red wing blackbirds 50-10
Magpie 2
Barn Swallows 2-8
Deer 1
Porcupine 1
Mourning dove 2
Robin 2
Groundog 1

7:52 Hailstone

Magpie 5
Sparrow Hawk 1
Robins 9-3-2-7-4
Sparrow Hawk 2-3
Say Ground Squirrel
Utah Jay
Flicker 2-1
Mourning Dove 2
Sparrow Hawk - 2
Robin 3-9-5-3-4
Mourning Dove 4-2-2-1
Magpie 8
Robin 6-7-4-9-4-2-6
Killdeer 2-2
Sparrow, Eng 5
Robin 1-5

8:25 Woodland

Sparrow hawk - 2-1
Robins 1-7-1-3-2-3
Magpie 3-3
Swallows 30-20
Groundhog 2-1-1-1-1
Say Ground Squirrel 1
Robins 4-1
Swainson hawk -1
G. dog. 1-1-1-1-1-1
Swallows 15
Blue bird 2

8:35 Provo River Bridge

Flicker 5
Marmot 2-1-1-4
Say Ground Squirrel 1-1-1-1
Baldheded Woodpecker 1
Cut m. conn 1-1
Pika 1
G. Dog 1-1-1-1-1-1
Robin - 3-1
Fly catcher 1
Junco 4
Chipping Sparrow 1
Chipmunk 1
Snowshoe rabbit 1

9:20 Wolf Cr. Pass

Grand Dog 1-1-1-1-1-1

discontinued list.

INSERT 400903-135

(1-8-7-40) upper end of Splash Dam and time for lunch. We had arranged for pack horses and one riding horse for mother and Burnett. Arrived at 1:27 P.M, left 2:00 P.M and arrived at Granddaddy Lake at 4:50 P.M.

1-8-7-40

(1-8-8-40) Mil uses a rather large wash basin to awaken her from a good? sound nights sleep! One receives such a view as this from door of tent.

1-8-8-40

(2-8-8-40) Camp on semi-island at Granddaddys lake. We made this camp a permanent one during our stay. Ideal during both day and night. Seemed to be fewer maquitoes, if a single one, on this island.

2-8-8-40

(1-8-9-40) Just sitting around waiting for sun to set low before Commencing our evening fishing. a notable collection of stetson hats to say the least.

1-8-9-40

INSERT 400903-136

2-8-9-40

(2-8-9-40) Some used fork while others merely held between fingers as a gesture. Our improvised table saved the day, As we had enough nature in the raw anyway, we felt we could delevate ourselves to the etent of a table.

3-8-9-40

(3-8-9-40) Meal time. Note the seating facilities. The most comfortable position being perpendicular.

1-8-10-40

(1-8-10-40) Ray watches water movement along the shoreline. This position about 50' from camp and at a place where we caught most of our larger fish with angle worms. Typical thunder clouds in distance. Looking directly east.

1-8-10

2-8-10-40

(2-8-10-40) Battleship Utah. note house slippers on Burnetts feet. Comfort to the 10th degree. Anyway it worked, but only at the expense of a great amount of human energy.

INSERT 400903-137

(1-8-11-40) Cub holding one of the larger ones. Most of these larger fish were taken both angle worms at most any time of the day, mainly, however during early morning or late evening.

1-8-11-40

(2-8-11-40) View from large rounded mountain west of Pike Island Lake, looking east with Rock Cr. Canyon in distance. Palisade direct-ly below. Smoke from forest fire billowing up from back of distant ridge.

2-8-11-40

(3-8-11-40) Mary & Cub in foreground. Palisade Lake directly below. a most inspiring view from this point, to the north as well as to the east and south. ~~Pike Island~~ Lake appeals to me as being an excellent lake for fishing possibilities.

3-8-11-40

(4-8-11-40) a typical evening around the fire. For one who has experienced such a situat-ion can only realize the finer feelings derived from contacts with the great out-of-doors.

4-8-11-40

INSERT 400903-138

1-8-12-40

(1-8-12-40) A fair example of our catch ranging from seven inches on up.

2-8-12-40

(2-8-12-40) Leaving our station at Grandaddy Lake after five most enjoyable days.

3-8-8-40

[inserted date:]

(3-8-8-40) Island Camp. Best fishing in strait between camp and opposite side of lake, probably due to the factor of depth and water movement, if any. At a point just to the right of the white log at point where small stream enters lake one would find hundreds of small fishing jumping out of water. They congregated in such number that the water just churned but surprisingly, one could draw a fly thru the area a receive no results. These fish, I am sure, could only be playing and not feeding. Such a total disregard for a fly was most interesting. Took a few measurement as follows: At Grandaddy Lake water 6 3/4" below the uppermost white water mark on rocks. Belsy down about same as Granddaddy. Solitary Lake 21 3/4 inches below upper white lined mark on rocks. The small lake above this deep lake had completely dried since my last trip here a few weeks ago. Spring water on south side of Lake at 5:30 P.M = 43°F. Lake temp (Grandaddy) at 5:30 P.M. 100 feet north of spring = 62°F. At 8:30 P.M lake = 62°F.

Spring temperatures would average 42 ↗ that is the springs of the entire area including those on Hayden Canyon along side of trail. Birds observed as being unusual are: Marsh Hawk, Osprey, Coopers Hawk, 9 pintail ducks, seven blue-winged teal or Cinnamon Teal, one of the group a ♂. all observed at Grandaddy Lake. Best fishing at 10:00 A.M. Evening fishing starts as shadow is 1/2 way up mountain side to the south and east of Grandaddy Lake. Mel and Mary made return trip on + Laura.

8-20-40

Special insertion of picture no 1-8-20-40 of Mary at Stewarts Cascades. Have no record of date.

Special insertion of picture 4-8-9-40 of Grandaddy Lake Trip. See account of that date.

Pelicans, Utah Lake, Utah 9/10/40 400910-140

camped at mouth of Provo River last nite and made observations on bird and animal activity during nite and early morning. Stationed at extreme end of river on south side some 30' from the lake shore. Arrived at 11:00 P.M and found the Great Blue & Black Crown Herons present; at least these were recognized. Watched a Blue Heron silhouetted against moon rays reflected upon the lake surface. At 12:00 mid-nite a musk rat swam up to the point some 8 feet from where the Heron was standing. The musk rat remained here for only a few minutes and then left directly for the bird. The Heron failed to react as the rat inspected at close range. Suddenly the heron jumps into the air with a surprise and fumbling movement and then flew 20' away where it once again struck its characteristic pose. The muskrat continued along its way. Several muskrats were observed swimming in river and lake adjacent to mouth of river. The last one seen just at daybreak. The moon beam across the lake was most fascinating, stretching from the very edge of the water to the west as far as the surface curvature would allow. The most impressive part of the beam being along its peripheral edges. Noticed that the sky at the distant end of the beam is totally black while on either side is considerable lighter if not lighter than the rest of the sky in general. The total blackness below moon to water was indeed interesting. When dawn lights were sufficiently intense for a more critical observation found 16 Great Blues generally distributed at mouth of river some 80' away and none more than 300' away. These birds no doubt had been here the entire nite. Heard their calls frequently & their wing beats above. They generally called just before alighting. From daybreak to 7:30 at which time I left found the number of Great Blues to fluctuate between, between the range of 15-20 birds. 19 were present when I left. While I was in plain view the birds did not object to the car & sleeping bag where I remained the entire time. One Great Blue remained 90' away the entire stay. As daybreak advanced the tendency was for the Herons to congregate in groups whereupon they lost their rigid attention and alertness and became hunchbacked and subtle.

This new group formation was probably effected by increase of light intensity and the effect of a slight morning breeze. which came into being at 6:10 A.M. as sun rays struck the top of lake mountain at about 6:20 A.M. Several heron attempted to eat dead suckers some 11 inches long but with no avail. Did not see at any time a heron catch or even strike at a fish. Frequently one or two would hurriedly walk from water across dry land and onto the dike. A few other heron to north and south. Gulls arrived at 5:30 A.M just as lights were sufficiently strong enough to allow for identity. At 6:20 as sun ray arrived at top of lake mt. found 3 new species arriving. Pelicans, ducks and Brewster egret in evidence. The 6:20 flight of the pelicans was the initial flight of the morning. By 6:30 75 ducks in groups of their own species had passed from north to south. Greatest flight during early morning. Western grebes called early in morning and nite and frequently presented themselves on lake beyond mouth of river. The climax of the morning observations was an aggregate of some 6,000 pelican about a mile south of the river on the two main promontorys between mudlake channel and mouth Provo river. The lake at present was some 2 or 3 blocks out and offered good resting grounds for the birds. These birds had been on the lake some 4 weeks but never had I observed them in such an aggregate. It was passably coincidental that they should all pick the same resting grounds on the same date. Generally they divided up into smaller groups and established themselves at different resting grounds on the lake. Did not see any pelicans on lake before 6:20 and before 7:20 A.M more than 6,000 had arrived at their resting area. Their manner of arrival was by long undenfile strings. They first lit on lake shore line on sands then later moved out to form large raft off point and then finally returned to shore line. This change and readjustment was not effected instantaneously but slowly; however, progressively. They arrived, in the main, from the South and west, from such directions as mouth Spanishfork river, Channel, Goshen Bay & Rock Island directions. The birds arriving mixing in with

these birds readjusting presented a most bewildering and confused mass of birds but even through the maze one could still pick out the line formation which is so characteristic of their flight. The most unusual thing observed was the great period of time necessary for such a large number of bird to become readjusted and stable. A shift of the mass from land to the water raft was only accomplished after 10-15 minutes. I wonder if such a shift was due to the fact that part of the birds were used to resting upon the water during the day and had persuaded a mass evacuation of the land to the water. However the land loving birds finally won out. The following indicate the pelican flight past the mouth of the Provo River at my station and represented only a small fraction of the birds that finally made up the mass aggregate:

Initial flight started at 6:20. These birds were some of the first to arrive at resting grounds: All birds passing to the rear.

6:20 A.M = 17 pelicans.
6:22 A.M. = 20 "
6:23 A.M. = 5 "
6:24 A.M. = 20 "
6:45 A.M. = 71 " (one single line)
6:47 A.M. = 208 " (mixed flocks)
6:48 A.M. = 49 "
6:48:30 A.M. = 2 "
6:49 A.M. = 3 "
6:50 A.M. = 31 "
6:57 A.M = 24 "
6:58 A.M. = 7 "

The estimate of 6,000 birds does not necessarily represent the total number of birds on Utah Lake but it is more than like the greater number of them. While at station noticed a Brewer Blackbird chasing a spotted sandpiper. A mixed flock of Brewers, Cowbirds and Yellowheaded Black bird kept flying to end of promontory and then back to main land. The Brewers and Cowbirds did not hesitate in work out on bare exposure of newly created dike but the Yellow-head remained with the vegetation of the mainland. Last nite before establishing station at river stopped along the way and examined the river to see how the suckers and carp reacted. There was, probably as a result of dredging the lower end of Provo River, an unusual congregation of suckers, carp, catfish in river, principally suckers averaging

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11 inches long. The river was literally packed with fish with hardly breathing or swimming space between them. When the surface of the water was reflected by the moon or artificial light the water were alive as if a rain or shower was pelting the surface. This surface agitation was due to the fish gasping for air at the water surface. Would estimate that where the fish were heavily congregated they would average 20 per sq. yard. After experimenting concluded that they sense water vibration, when jumping on bank for 500 feet while they sense earth vibrations at about 210 feet. That is when I jumped on the surface of the ground on a bank 12' above the present entrenched river found the waters literally churning down river in a progressive wave. The reaction seemed almost instantaneous but presented the wave effect as the sound travelled along. When 210 feet from bank and jumped on ground received the same quick splash of the water as the fish left surface while the reaction both sound was effected almost instantaneously found that they reacted entirely different with the light ray of a flash light. One could turn the light on the surface of the water and flash it about but the moment the light was withdrawn or turned off the fish reacted immediately creating a great splash & then silence. The reaction to this light being turned off was instigated by one impulse, every fish reacted at exactly the same split second, so to speak. The light had to be held for at least 2½ seconds to good results. 5 seconds brought complete response by all the fish. Another interesting observation was the response to my shadow cast upon the water by the moon. As I walked along the bank the shadow would be lined with a splash created by the fish as the left the surface of the water. Splashes occurred every 5-12 feet as I walked along. Normal walking did not produce any effect upon the fish but a slight jump would send them to the bottom. A heron flying by created a splash where it shadow was cast upon the water by the moon. At one point where artesian well water entered the river found for just about 5 second the fish to be jumping out of the water in a most interesting manner. As to just what the cause could be I do

not know. Fish in river from near mouth (200' up) to head of still water above Jaques. They could have been farther up but did not investigate. When disturbed once they require on the average 40 seconds before being ripe for another reaction. Very few dead fish. probably 1 per 300 feet. They move about in same direction which vary from place to place along river. For some time looked like there might be a down river movement. A few fish jumping completely out of water. The most impressive feature of the the whole experiment was the instantaneous reaction to vibration and light rays. Conducted about 10:30 P.M.

Pelicans, Utah Lake, Utah. 9/11/40

Drove down to Utah Lake at first large promontory south of mouth of Provo River. Few pelican on shore line, probably 130 in all. The greatest congregation was at mouth of Mid-Utah Lake Channel. These birds flew south and west and did not come to resting grounds In morning, sun up.

Pelicans, Utah Lake, Utah. 9/17/40

Arrived at end of sand bar promontory at 6:25 P.M. and made station at end of tamarix growth. Made appearance unnoticed to pelicans resting on shore line to the west and south-west. The purpose of trip was to watch the pelicans reaine themselves from their days rest and to determine how and when they left for their feeding grounds. The observations were conducted without them knowing of my presence. being stationed some 1,000 feet from them. With the use of the Binoculars was able to follow closely their general action without effecting their normal activity. Skies partially clouded with cumulus-status-nimbus clouds. Few clouds hung low on Provo Peak. Rain assured. Slight breeze. Temperature 71°F Raining at south end of Cedar valley and Payson area in localized spots. These thunder clouds later swung around the base of the Wasatch and trended north over Provo City, hence north against Timpanogos etc. The station here was only effected by heavy breeze & winds and slight showers but rains in Provo proved to be of cloud burst proportions. These storms occurred after pelicans had all left before they began. A solid continuous mass of resting pelicans occupied an area 1,200 feet long and from 50-80' wide. closely packed adjoining beach of water. They were showing signs of activity on my arrival at 6:25 P.M with several birds already standing up and preening their feathers which would indicate that they were had just risen from the ground. The birds were particularly concerned with the breast feathers

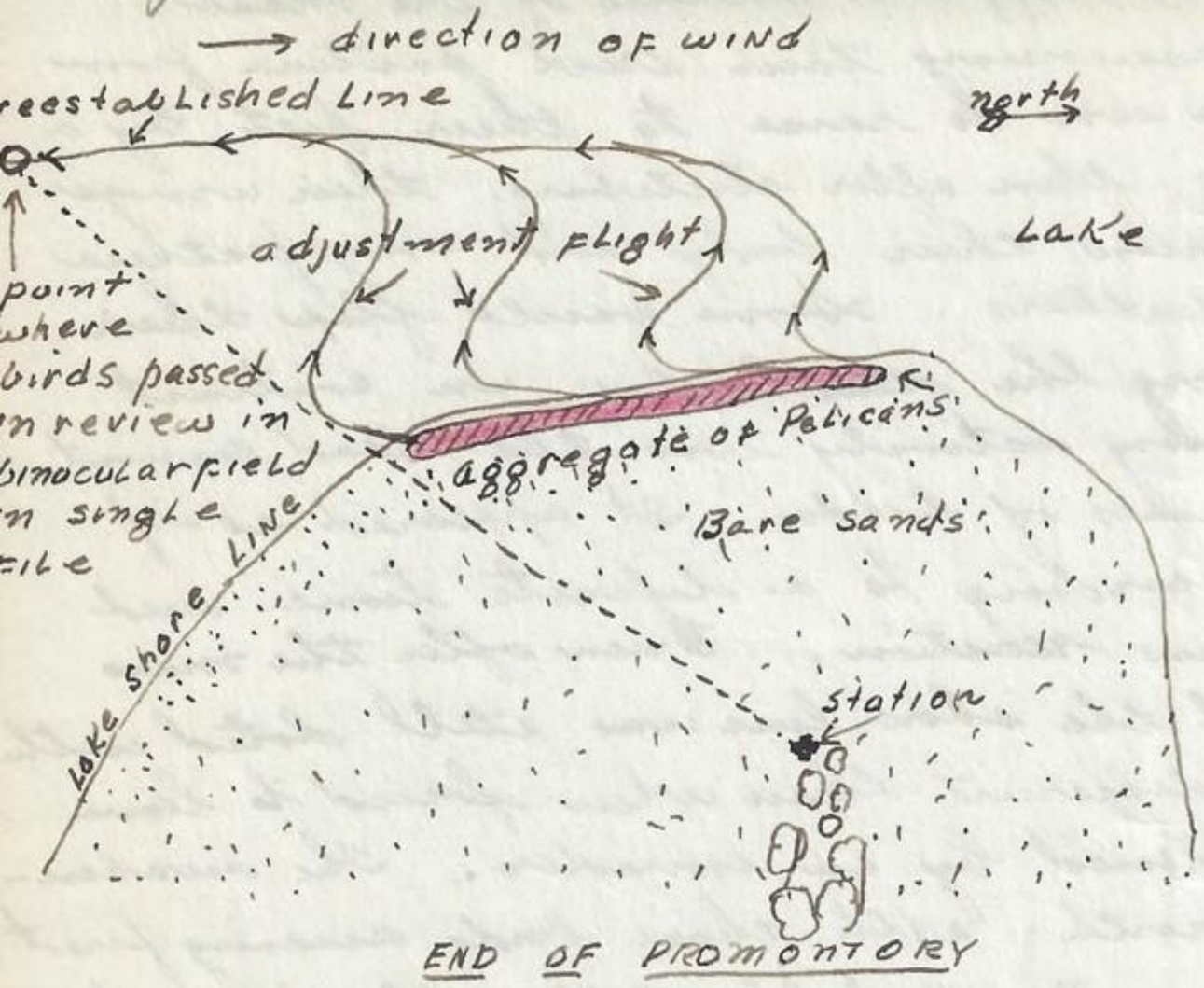
400912-145

with the characteristic pose being with the neck stretch straight up and the bill drawn down paralleling the neck with the attempt being to adjust feathers of neck up as far as it could be reached by the bill. This accentuated and characteristic posed was opposed to the normal resting repose and seemed to subdue size of the resting birds which were lying flat with neck and head under cover represent-ing a flat mass of feathers. Except for those few bird standing, the mass of resting birds was a picture of sound sleep in earnest. The gradual awakening and reviving of life and their final departure was a most impressive picture and a most significant one. My original plan was to stalk these birds and then force them to fly and by taking a picture would be able to get a more accurate count as well as get a picture of realistic value of a mass of pelican leaving the shore line and silhouetted against the glowing western sunset. However a sense of appreciation of those things in nature of a natural occurrence held me back from instigating the originate idea. This witnessing of the natural evolution of leaving their resting grounds in the evening proved more valuable and interesting than getting a pictorial record or temporary thrilled of seeing a large mass of bird leave by a forced stimuli. So as it remained, I kept in blind until after the last bird left the area with every thing being effected in a natural normal manner. Afterall such a departure is the only value that will remain permanent in my mind & memory. After witness-ing such a sete am convinced that pictures and records of spontaneous departure of large masses of pelican is abnormal and the activity is instigated as a result of intrusion of a foreign interference, because such an act is not found in nature as far as my own experience with pelicans can account. In fact the most impressive thing about the manner of evening departure of pelicans to their feeding grounds is lack of instantaneous reaction but one of gradual and progressive evacuation of their resting grounds. In fact it required 38 minutes for this flock of birds to leave with birds on air practically the entire time, at least this was the time required from the time when the first bird left to the time the last bird left. The last 14 minutes of this time found birds rising continually in an never ending pro-cession. The fact remains that they did not leave as if prompted by one immediate impulse. The recording of events are as follow. Observations started 6:29 P.M. finding the birds gradually rising from their resting position, about 18 birds standing in 3.000. at 6:31 P.M 2 groups of 2 and 3 birds sailed in from the north and lit among birds at north end of mass. One of them lit in extreme north end at edge of mass.

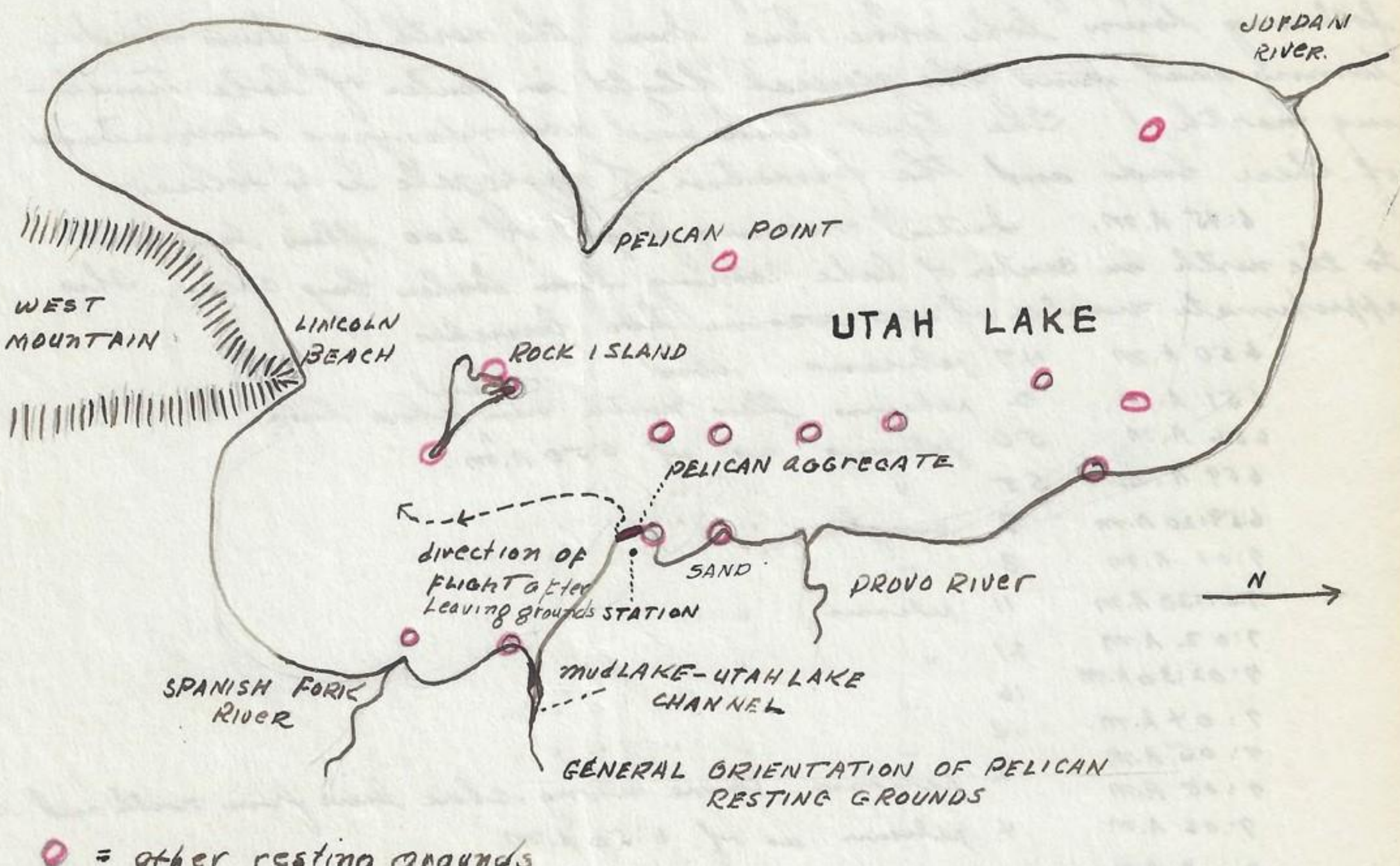
The birds were slowly but continually → standing up and by
6:29 P.M some 100 birds were up with the greatest number
being at the south end of line. The tendency was for small
groups to rise at a time at different sections of the mass.
The usual manner of assuming their erect posture from
their prone resting repose was to raise to their feet by a
few flaps of their wings, then after stretching their wings
would commence to preen their body and wing feathers
particularly the breast feathers. Some would flap their
wings and take among the other birds. In contrast
with this new awakening activity was the dead earnest
slumber of the great masses of birds. It appeared as if
they were awakening according to a definite time and
not effected by the mass reaction. Even after the mass
evacuation commenced the shore line was still dotted with
sleeping birds. Very different than when forced to leave
all at once when frightened by an invader. The awaken-
ing was from south to north. with those birds arising first
being the first to leave. no audible calls offered at
6:29 the first bird left followed by other groups and
by 6:31 P.M 51 birds had left. This first convoy of birds
was from among those at the south end who were first to
rise from the resting position. all but 5 of these birds
flew west toward rock island while the other group, 1, flew
south. The next group did not leave until 6:45. at which
time 4 flew out a short distance from shore and lit on water.
probably to get a drink of H2O. Shortly 4 left north end of
mass, flew down along mass and lit in among them.
This proved to be the rule later on when the northern
birds would fly down the line directly over the main
mass before taking off to the water. The greatest number
now standing up along entire mass but in the main
the rest were still resting but progressively coming to
attention. at 6:50 four left north end of mass and
flew south to center of mass. at 6:50 P.M could see great
masses leaving their resting grounds at the north end of
Rock Island. Rain & lightning in Tintic range and at
isolated spots to south, uneffected here. Sky colors fading
6:54 P.M 4 left north end, flew south over mass and continued
south. 6:54 P.M Slight increase in breeze Pelicans now
commencing flights in earnest not all at once but leaving
in ever increasing numbers. Cared count them one at a
time at first but soon had to count by 10's as they estab-
ed themselves in long lines to the south. To count them
as they left the grounds ~~co~~ would have been impossible

but → fortunately they left area → in such a way that it
was possible to get count as they established their long
line farther to the west and south.

The adjustment flight was made by first flying directly into wind for el-evation then swerving down and to the west taking advantage and being carried by the wind and then turning south again into the wind. Their reestablished line was only a few feet above the water surface. The picture looking straight west was one of confusion and crossings as there were several different directions of flight being carried on at the same moment. but actually their was no confusion except in perspective as even the adjustment flight was regular. Out of it all was a reestablished line of uniform direction, motion & rhythm. A traffic officer could only acquire the secret. It was only along a part of the reestablished line that I was able to make the count. As far as I could tell practically all birds trended south directly into the wind except the first groups which flew west as indicated. Frequently and toward the last the birds passed the binocular fields in such number that it was necessary to estimate them by tens. The lights toward the last were fading and all that I could see was indications of wing beats as they slowly winged low across the water. It is highly possible that there were birds that left on a different direction or were flying high against poor background for visibility and in which case I would have missed, however I am confident that practically every bird passed in same direction across the point where binoculars were trained. The actual count being 2960 and if an error is to be found will be on the favorable side. The flight seemed endless and led one to believe in spontaneous generation from the mass of birds before me. The slight wind was probably responsible for the direction and manner of leaving The flight ended abruptly at 7:08 P.M. at which time the twilight had advanced to the point where it was difficult to define the birds in flight. At 7:10 the geese in channel area made



terrific noise as if objecting to probably. pelican arrived but am not even sure the pelicans arrived at that point. Few drops of rain at 7:15 P.M with wind velocity changing to the command of the oncoming rain at 7:14 storm. This storm originated in cedar valley and followed around base of Wasatch mountains through Provo and hence north. Received only a few drops of rain from the peripheral edge. These pelicans with those on north end of rock island should give a population of at least 5,500 birds. An examination of the resting grounds revealed numerous primary feathers and large white covert feathers as well as many smaller ones Excrement spots every two or three feet apart. Gulls and



= other resting grounds

about 10 cormorants among pelican group. Cormorants appeared to be following pelicans from place to place. Canadian Geese called entire stay from north to channel south. Instead of flying along shore line around point the made a short cut directly over it. Great Blue Heron generally distributed along shore line. Picked up on sick Gadwall duck. Evidence of the avocet, gulls, and ducks having been sick earlier but deliorated & dry remains only present. 1 pelican dead from 4 weeks ago. Left area shortly after 9:30 P.M. In conclusion can say that a worthwhile value is gained in witnessing the somewhat quiet and solemn departure of such a stately & dignified bird.

9/12/40

At 11:00 P.M the crickets at home called 72 times per Minute.

Pelicans, Utah Lake Utah.

9/13/40

Arrived at promontory point north of mud Lake - Utah Lake Channel as of the visit and above station as 9/12/40 P.M. at 6:25 A.M. 7 pelicans already on resting grounds at a point which would represent the south end of the 9/12/40 aggregate. The general flight was as follows. north from somewhere west and south of rock island. South along lake shore from mouth Provo river direction. Return of pelicans that were seen first flying north up middle of lake or they could have been other birds. The most peculiar thing was that no birds were observed south of station nor did any arrive from that direction. Rather peculiar in the fact that all birds left to the south last night. The aggregate in front of us was formed from birds following down lake shore line from the north or from birds turning east from the general flight in center of lake traveling north. The exact time and accompanying observations of these birds and the formation of aggregate is as follows:

6:45 A.M. Initial morning flight of 200 flew low and to the north in center of lake, coming from Goshen bay area. This approximate number of 200 was in two bunches.

6 50 A.M	47	pelicans. ibid.
6 51 A.M.	2	pelicans flew north near east shore line.
6 56 A.M	50	pelicans as of 6:50 A.M.
6 59 A.M	55	" " " " "
6:59:20 A.M	3	singles " " " " "
7:01 A.M	3	" " " " " "
7:01-30 A.M	11	pelicans " " " "
7:02 A.M	21	" " " " " "
7:02:30 A.M	16	" " " " " "
7:04 A.M.	14	" " " " " "
7:05 A.M	2	" " " " " "
7:05 A.M	2	pelican. Came along shore line from north and lit here.
7:06 A.M	4	pelicans as of 6:50 A.M
7 0 8 A.M	12	" " " " "
7:10 A.M	50	in group of 23-18-9 from west and lit here
7:12 A.M	1	" " " " "

in center of aggregate.

7:15 A.M 32 pelicans as of 6:50 A.M but 18 left main flock and arrived from the west to aggregate.

7:17 A.M 16 pelicans from west, paused and then flew north.

7:17:20 A.M 15 " " " " " " " " " three of which left group and arrived at agregate.

7:18 A.M 1 pelican lit in aggregate from the north.

7:19 22 pelicans from west. 5 split left and continued north.

7:20 15 pelicans from north and lit.

7:21 A.M 3 pelicans arrived at aggregate.
7:22 A.M 24 " flew by to north.
7:22 A.M 8 " " " "
7:23 A M 1 " arrived from west.
7:24 A.M 5 " " " "
7:24:20 A.M 8 " " " "
7:24:30 A M 8 " " " "
7:24:45 A-M 4 " " " "
7:24:55 A-M 3 " " " "
7:25 A-M. The pelicans now were returning from the north in center of lake in same manner as the flew north to begin with. These returning birds could have been other birds. Indicated only the numbers of birds arriving and not their direction but in the main they come from flights in center of lake going south and then winging east or from the north down along lake shoreline.
7:27. A.M 1 pelican arrived at aggregate from north.
7:29. A.M Pelicans were flying south in middle of lake in great number and going south west of rock island. In 126 seconds counted 175 bird as they passed one point in field of binoculars flying south in middle of lake. These 175 were in single file and practically continious except for two breaks in the line. Did not keep record of these birds flying in middle of lake from hereon.
7:30 A.M 2 left here and 1 arrived
7:32 A.M 7 pelicans arrived at aggregate from the north.
7:32:30 A.M 8 " " " " " " "
733 A.M 12 " " " " " " " "
734 A.M 28 " " " " " " " "
734:20 A.M 24 " " " " " " " "
7:35 A.M 2 " " " " " " " "
7:35-10 A.M 87 " " " " " " " "
736 A.M 4 " " " " " " " "
736:10 A.M 12 " " " " " " " "
736:20 A.M 4 " " " " " " " "
737 A.M 10 " " " " " " " "
7:38 A.M 20 " " " " " " " "
7:38:15 A.M 46 " " " " " " " "
7:39 A.M 20 " " " " " " " "
7:40 A.M 1-8-3-1 " " " " " " " "
7:41 A.M 10-8-1 " " " " " " " "
7:41 A.M 1 " " " " " " " "
7:45 A.M 1 " " " " " " " "
7:50 A.M 2 " " " " " " " "
751 A.M 2 " " " " " " " "
7:55 A.M 5 " " " " " " " "
7:56 A.M 2 " " " " " " " "

2 Cormorant following the above 2

7:56:30 A.M | 400913-151 | 1 pelican arrived at aggregate from north.
7:58 A.M | 1 " "
7:59 A.M | 2 " "
8:00 A.M | 1 " "
8:02 A.M | 1 " "
8:05 A.M | 8 " "
8:06 A.M | 1 " "
8:07 A.M | 1 " "

Left at 8:07. Before leaving found these birds to be occupying 15% of area that was formally occupied by the aggregate of 9/12/40. at mouth of Provo River found 220 pelicans in raft about 1/2 mile out. They were very nervous as a storm and rain was just arriving at their position. They left after some interesting gyrations. From their quiet resting they became perturbed by the oncoming storm which already was advancing across the water with a bold rain front. During the heavy winds that preceded the storm the pelicans became ever restless. The tendency was for the birds facing the blunt end of the storm to rise from water a with a wheel to the left would fly with the wind along raft to other terminal which put them in the lee of the aggregate with a subsequent protection from driving winds and waves. This wheeling continued from fore to aft until the entire mass of birds had advanced somewhat to the east away from the direction of the wind. Finally the rain struck them and then there was a change action. The birds commenced to fly directly into oncoming storm. It took them about 5 minutes to leave the area as they did not leave all at once but gradually. However their departure was accomplished in far shorter time than was experienced when they left resting grounds for feeding areas. When pelicans are approached by one they remain alert and leave as if by one common impulse. Their leaving is accomplished by considerable fluttering and intended commotion with confusion noises but this is not the case as of the apparent slow normal reaction process when left to leave according to their own desires and group reaction. The last pelicans to leave the soft disappeared entirely, or better were enshrouded by the encroaching mist & rain.

Pelicans, Utah Lake

9/14/40
Tonite drove down to the lake to station of 9/12/40 to check on nite activity of waterfowl and to watch pelicans arrive from their feeding grounds. Camped instead on the very edge of lake shore just 300' north of the regular resting grounds. This would necessitate the pelican to fly over

camp before arriving at grounds. → at 12:10 A.M. took temperature 300' from shore and found it to be 68+°F while temperature at water edge was 65°F, apparently reverse of what it should be. Several large flocks of ducks passed overhead at this time. One blue Heron passed overhead against moon background. Incedently to watch the moon slide in and out among clouds is a most interesting thing but more fascinating is to watch the illuminated edge of the featherylike clouds readjust to the irregularities of the winds. Infact I would pronounce it one of the wonders of the universe. This morning (9-14-40) at 5:30 in early morning lights a night hawk flew by. Not much movement of birds until about 6:20 when 28 caspian terns passed by. not all at once but at frequent intervals of about 3 minute. At 6:32 A.M. some 700 bird passed over camp but instead of alighting at resting grounds the continued to the west. They continued south ~~but~~ to grounds but turned toward rock island. My presence, was no doubt was responsible for their reaction. They recognized my sleeping bag at some 200' and then swerved to the leeward and flew around the obstruction to continue. Their ability to detect a foreign obstacle is keen. They kept their formation regardless of the interference. The second group of about 1,000 birds flew over about 10 minutes later. all these birds had intentions of stopping at resting grounds but continued on toward rock island. The two different groups came in long single line as if endless in extent. If I had been station in regular blind would have witnessed a most unusual arrival of these birds returning from their night feeding grounds. These birds came more abruptly and in more compact number in a shorter period of time than experienced the other morning. 30 pelican lit at ~~fed~~ resting grounds and remained until I left when they all left instantaneously. On beach found 2 pelicans, one of which had been their for some 4 week the other recent. 17 raven near mud lake channel among cattle at edge of water near mouth of Provo river found 4 flickers ~~flying~~ along edge of lake some distance from trees. 227 pelicans over sand promontory north of Station. They swam away when I drove by at 2½ blocks. During attention they all stood in same direction. Four sink ducks along lake shore between station and Provo river. Two gulls eating back of duck which

400914-153

was → paralized but not ↑ enough to keep from interfering with neck muscles, a most pitiful sight. at Brooks river he deep waters recorded the fish congregations with camera. Picture (1-9-14-40) shows the general river habitat and waters pitted with

1-9-14-40

2-9-14-40

gasping mouths. Indicates entrenchment of river and type of vegetation with Black willow predominating: Picture (2-9-14-40) shows a congregation of large 2½' fast carp receiving oxygen from fresh supply of water from the water falls at edge of river. When disturbed from falls the fish required about 15 minutes to regain the formation. This area at base of falls held nearly all large carp. Picture (3-9-14-40) no. no. 3. indicates numbers in a normal stretch of the river. Picture (4-9-14-40) shows how carp line themselves up against log to eat algae from its sides. Picture (5-9-14-40) general view of carp. Find that the great predominance of fish are carp.

4-9-14-40

400914-154

with a few catfish and a green back Hydrophlox and another larger minnow. The carp averaged 10-11 inches, while the cats averaged 6-7 inches. The fish reacted to most every bird that flew across the water from side to side or up the river. leaving a wake of aggitated water trailing flying bird. It was peculiar to watch a mud-hen swimming around on river. Instead of a mass reaction of the fish there was a negative response in that the fish had to be fairly be push away as the bird swam along. Frequently it would

5-9-14-40

Data to picture no 5-9-14-40

This picture shows a typical congregation of fish in the river A great predominance of the river was populated in this degree. From the negetive of this picture counted 1,538 fish by blocking off.. areas in picture. This number does not represent all fish found at this point because many were beneith surface of water. The area represents 22 linear feet of the river or 69.9 fish per running foot of river. The width of river is average here. By multiplying this by the several miles of river occupied by these fish one receives an estonishing number of fish

↙

peck at fish as being annoyed. Found the fish to react to ground vibration and quick motion. If one moved slowly and tredded lightly could walk right along side of bank without interfering with their actions. Plan in comparing known aggregate of fish on these pictures with actual condetions in hopes of receiving a more accurate estimate of numbers of fish in river.

Provo.

9-14-40

Had a cloud burst pass over city this evening after sundown. The cloud came from the south and invaded a clear sky. It probably followed the same course as have other storms of last few day coming from storms form in the Cedar Valley - Tintic range and sweeping around at base of Wasatch Mountains following north to Provo Canyon. & hence north and east. I do not recall of experiencing such a large amount of rain to fall in such a short time. Shortly after storm skies again became partially cleared.

400915-155 Lincoln Beach, Utah Lake. 9/15/40

Drove to Lincoln Beach and return this afternoon. via lower roads at Provo round-house saw 15 night hawk flying together above railroad tracks. Among other birds saw 1 lark sparrow, 10 mourning dove, Vesper sparrows, flickers. In flooded pastures on lowest road that runs from Springville to Spanishfork river and about half way saw large flock of sea gulls and 20 or so white face ibis in flooded pasture. About 1 mile directly west of Springville saw flock of some 4.000 blackbirds in flood field, consisting of Brewers, yellowheads mainly and redwing as well as a few Cowbirds. Observed another large flock of red-wings west of and south of Steel-plant which were mainly redwings. At Lincoln Beach found no Pelicans in sight with aid of 8 x binoculars except 4 or 5 lone ones swimming in lake at 4:30 P.M. Light not to good for distant inspections. In one group of resting shore birds counted:

23 caspian tern
16 Cormorants
4 ducks
30 gulls

The caspians came and left as did the gulls. 2 new cormorants arrived. They were standing on shore line, one swimming near. Ducks feeding on shoreline. Observed a few flocks of ducks flying in center of lake. one flock in single indian file line of 120 birds. Flock of 47 Canadian Geese flew single file west between rock island and Lincoln beach from Spanish fork or south end of lake. They lit on lake to west at 5:00 P.M. At 5:45 P.M another flock of 92 Canadian Geese came from vicinity of Spanish Fork or south end of lake and lit on lake half way between rock island and Lincoln Beach. They swam west. At 6:10 P.M saw 75 Canadian Geese in pasture where road crosses valley to west mountain about 1 mile east of West mountain, bringing the Canadian Geese count to 214 during the afternoon inspection. no duplications. No Great Blue heron, Brewsters or Black Cr. at Lincoln beach because of the fishermen here. On route home from pastures in Springville to round house in Provo as observed along lower road paralleling lower railway tracks counted the ducks coming in to feed as we drove along.

Left Springville pastures at 6:45

flocks of 40, 15, 25, 4, 4, 10 } one area of flooded pastures in Springville.

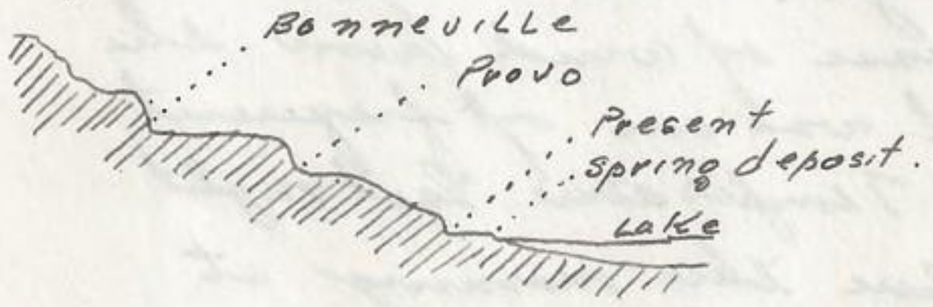
2, 3, 2, 5, 3, 2 } in 1/2 mile stretch on flyway S.W of Steel plant

5, 3, 1 } same as last.

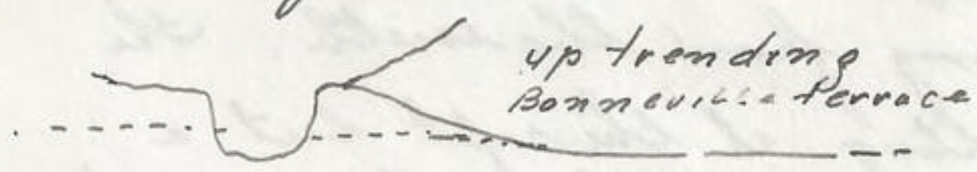
Arrived at Provo at round house at 7:05 P.M.

Ducks listed as observed and occurring first in the 2 areas listed. It would appear that flooded pastures

are held as a premium. The sunset as we left Lincoln Beach was a rich yellow without cloud outlines. On road south of Lincoln Beach found four snake that had been run over by cars. The snakes occurred in pairs and near each other. The first first two were found just below medium caves on road and were within 150 of each other. One was a Blue racer measuring 3' long and the other a blow snake 2'4" long. Both recently killed is blow snake still retained a reflex. Same 1½ mile south of Lincoln beach on east side of west mt and probably a ½ mile beyond first pair of snakes found two more a Blowsnake measuring 3' 2" and a Blue racer measuring 2 feet. They were several days old and both together. They could have been fighting or attracted when run overs. The shore lines might indicate another present stage in receding of lake Bonneville.



The present level of last 100 years has made another wave cut terrace in either basic rock or unconsolidated material which is just about as conspicuous as the other prominent terraces. Can see to north on Traverse mountains still another level above Bonneville level. at least it is so pronounced that it would indicate another level regardless of how unlikely it would be. The bonneville level at mouth of Provo Canyon run up to meet the canyon entrance some 100 feet or so. above Bonneville height



Utah lake at present has wide extensive shore lines. Sparrow hawks appear in abnormal numbers and probably in migration from Canada.

Pelicans, Utah Lake. 9/14/40

From foot hills east of Provo could see with 8× binoculars about 3,000 pelicans on north terminal of Fork Island. Wind blowing from the south and raising dust cloud several hundred feet from mud lake channel to mouth Provo river. Fishermen in 3 boats at point of station 9/12/40 and no pelicans could be seen as a result.

Pelicans, Utah Lake. 9/19/40

Spent last nite at station as established on the 12th of same month. Very few birds flying or calling either late last night or early this morning as contrasted with previous mornings. Shortly after dawn found thunder clouds in sky with mountains east of Provo and Timpanogas mountain capped with a large flat bottomed cumulus type cloud. As I awakened found a mixed group of California and gulls and Caspian tern resting of shore line n.n.w of station. These birds probably arrived here at daybreak

or ite→ (possible that →) they could have arrived even earlier.
Two Great Blue heron remained just ~~as~~ north of station
the entire period of observation resting hunch backed along
the shore line. At daybreak heard swallows flying
overhead. Could not see them but with aid of 8x binoculars
found them flying S.W high in sky as if evading a thunder
cloud that was approaching from the south. They passed
over in waves or group, each group generally distributed. This
cloud approaching dropped a few drops of rain for about 10
second, the shortest storm I have encountered. Another short
shower later about 1½ minutes later. These storms had a
N. E. trend. The last storm came from ~~to~~ Lake mt and
follow N. E along west half of lake. The clouds hung
along east mountains and kept sun from shining on
the east side of lake and it was not until about 8:00
A.M that it finally broke through. This mild early
down was followed by an increase of wind from the
south. As the day turned out was one of frequent
rain and cold temperatures. Temperature last night
was 56°F at 11:00 P.M. Temperature this morning at
daybreak = 50°F. The general pelican flight began
on time and came from the goshen bay area, flying north
in middle of lake. at first the trend was north but
soon was stopped as a large group lit in lake along route
and formed the nucleus of a raft which continued to
grow as from the bird still coming from the south. The
great percentage of pelican were alighting at the raft but a
few deviated and flew east to arrive at the resting grounds
just north of the station. after remaining on raft for some
time they left and flew directly to the resting ground
and joined the small group already here. The arrivals
were as follows:

The main and initial flock of pelicans from goshen
bay north flew north in two main flights. Those flying
to north beyond mouth of Provo River some 2 miles out from
mouth flew by in this order:

3-44-11-29-8-1-12-7-29-1.

Those following formed raft N.W of station and about 8 blocks
out from shore line: Their arrival at raft ~~as~~ was recorded as:

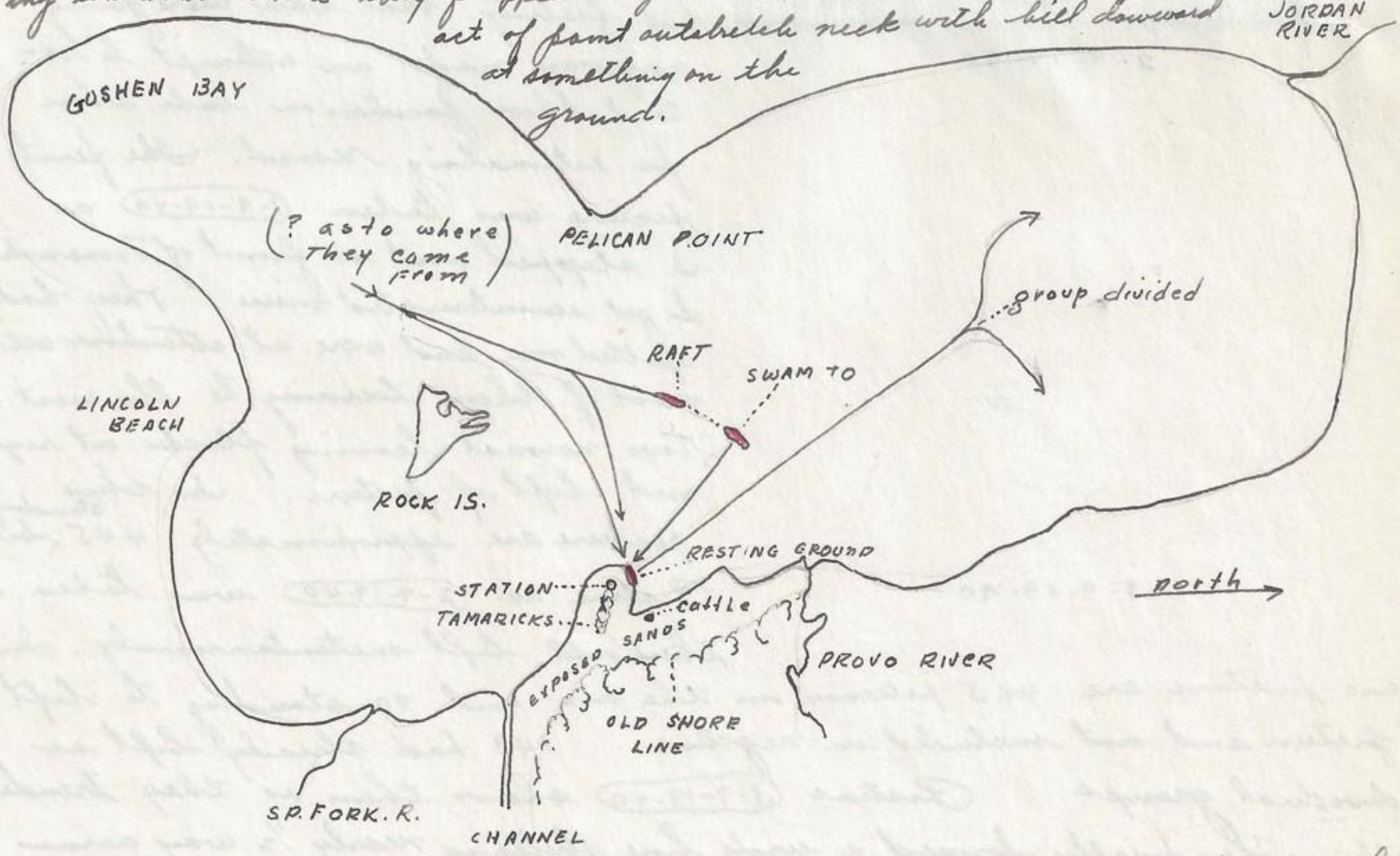
50-7-21-1-12-2-35-5-3-33-10-10-1-12-20-12-6

25-10-5 The second flight of pelican, each flight of course
taking probably 20 or so minutes, to arrive at raft is:

14-42-38-17-3-1-8.

The pelican arriving at the resting grounds at station
and all coming from the S.W from parts of the initial flights ~~as~~:

5-49-42-12-40-19; Shortly after another group followed of:
63-1-13-13; The next group to arrive was birds from the
raft that had previously formed in lake. Their arrival to the
resting ground was in this manner. and in such numbers that
filled the lake horizon. Their arrival however was of such a
periodicty that I could count them accurately. They are: 31-
35-160-141-10-15-2-1. A few came later from the
S. west and joined group at resting grounds and are: 2-13-7-
3-1-.
Could see that others passed north on west side
of lake but the mirage effect did not permit a count. Those
birds to arrive here then ~~totaled~~ numbered 678 individuals.
The second group of 44 birds of mixed flight had a cormorant
mixed in among line. The pelicans allowed for it in their
formation. Generally speaking the pelicans spaced themselves
equivalent to 4-5 lengths of the bird or 9-10 feet. While on
resting grounds three vultures flew directly over the pelican
group but did not cause any disturbance. not even the
slightest concern. Vulture only 20 feet above surface of the
ground. Group of 32 ovocets flew east by pelicans along
shore line. 2 great Blue heron remained near entire stay.
Pelicans original position on promontory governed by group of gulls and Caspian
Pelicans reacted to sun when it first hit them was by some leaving shore line and waddl-
ing landward where they flapped wings and struck a momentary, rigid Sandhill Crane
act of point autabeleh neck with bill downward
at something on the
ground.



General orientation and itinerary of flights of this morning. The
manner of arriving of the pelican was interesting. they would ~~by~~ land
and bask for a few second but would soon start freening their feathers,
especially the neck ones. Then shake their body with bucks forcably
extended. This was generally followed by a yawning with bill held open.

while they 400919-158.1 they were standing up the entire time except for about 2% which had already taken their resting position. As the cattle came from the old shore line to edge of lake for their morning drink the pelicans would come to attention for a few seconds but waved again revert to their normal postures. The attention fall-in is made by all birds standing erect with heads & ~~backs~~ necks held rigid and high with bills and body pointed toward invader. If it be a false alarm they soon fall-out in 10 seconds or so. If some of the birds are resting they rise with a flapping of wings to their feet.. This morning the cattle, which were some ½ mile away, came them to come to attention several times. Finally they decided to leave and was accomplished as follows. 1-1-2-3-10-4-20-10-8-18-8-25-4-10-19. My general policy has been to come & leave the station without interupting these resting pelicans but feeling that they were going anyway made an attempt to record their position on lake shore for estimating record. The first picture was taken (1-9-19-40) as I stepped out in front of Tamariks to get uninterupted view. They had spotted me and were at attention with most of them turning to the west. Two normal leaving flocks at right and left of picture. In this standing picture are appoximately 445 birds. Picture no. (2-9-19.40) was taken as they all left instantaneously. In this picture are 445 pelican in the air and 90 standing to left of picture and not included in negative. 143 had already left as individual groups. Picture (3-9-19-40) shows them as they trended north. They finally formed a wide line stretching nearly ½ way across lake. This line got so spread out that it split, as indicated in the map. This single line in a broad side view was certainly a most interesting site with the line moving along like waves of the ocean. These birds flew out of site to the north. Birds left at about. 8:10 A.M.

1-9-19-40

2-9-19-40

3-9-19-40

Flock of 23 avocets passed. 8: Great blue heron on shore line between station and mouth of Provo river as I drove along. 5 of them standing in an isolated rush mat some 30' from water. 2 sick ducks. 1 of them partially eaten by a marsh hawk while duck still with head elevated. Pelican group on sand promontory to north between Provo River & Geneva. During the mornings observation recorded the number of ducks that flew by. Time of observation of these ducks was from daybreak to 8:00 P.M. As these observations were made as secondary to pelican observation probably missed about 30% of the intrinsic number. These ducks were flying, in the main, in a southernly direction. The grouping and their time of occurring are: 12-18-6-4-6-45-5-21-7-1-5-4-9-2-2-2 for a total of 149 birds

Provo. 9/20/40

Rained considerably last nite

Pelicans, Utah Lake. 9/21/40

Spent tonite, 20th at station as of 9-12-40. atmosphere as if smoked, presenting a most beautiful fall sunset. Good north wind blowing. at small bay N and east of station count 48 ducks, 310 at shore line N.N.W of station and 788 resting on shore line W.S.W of station. will designate as flocks A-B.C. Planned on keeping occurrence record correlated with time. The wind was no doubt responsible for duck flights. On way down lake shore observed several flocks of ducks flying about lake. Arrived at 6:15 P.M. of the 20th

6:16 P.M 12 ducks flying south
6:17 P.M 24 " " "
6:18 P.M 18 " " "
6:20 P.M Sun down
6:21 P.M Groups of 6 and 9 ducks.
6:25 P.M 2 ducks flying south
6:30 P.M 6 " "
6:35 P.M 3 ducks
6:40 P.M 1 duck. Temperature 60°F
6:41 P.M 100 ducks left B group and flew north
6:42 P.M 100 " " " " " " "
6:45 P.M 60 ducks flying south 12 of which stopped at B. group.
6:46 P.M Boat from rock island going north.
6:50 P.M 60 ducks flying south.
6:52 P.M 4 " " "
6:55 P.M 35 ducks flew overhead to south. The visibility now poor with western sky only place to see duck silhouetted. Can still faintly see rock island. ducks still resting on shores. Skies clear with Cygnus (constellation) directly overhead. Moon not up as yet.

Next morning. Down at 5:30 A.M in a clear sky. Excessive amount of dew causing a saturated sleeping bag covering. Temperature 47°F at 5:30 A.M. no wind. Moon just west of being directly overhead. Last nite awoken several times and found

flocks of 400921-160 ducks to be passing south. At 7:05 P.M - 9:20 P.M - 7:22 P.M. - 900 P.M - 9:30 P.M. and 11:35 P.M. Wind subsided at 9:30 P.M. At 9:30 a Great Blue Heron passed south croaking as it flew. Black Crown Night Heron started calling after late ~~twilight~~ twilight. It could be traced by its calls. Western Grebes called all night. This morning at: 9/21/40

5:53 A.M First 15 ducks flew north from the south. Noticed that 20 resting ducks and 18 gulls plus 2 Heron were resting at 5:30 in same area as of last nite, indicating that the great masses of ducks had left and that the Blue Heron and gulls had arrived since then. I believe the gulls must arrive before lights are sufficient to see them came. If this is not true it means that they would have had to come during the night which is not very likely. Invariably one finds groups of gulls along the shore line early in the morning where the last thing the night before, they were not there.

6:03 A.M 24 Canadian Geese came down east shore line and instead of going out around peninsula they cut across to mouth of the channel. She call frequently as they flew along in formation some 150 above the ground and finally continued south toward Sp Fork river.

6:05 A.M. A few gulls active and calling. In generally however they do not fly around until later when one finds them continually in the air generally flying high with directed flight.

6:14 A.M. 2 gulls flew south being some of the first ones also 2 caspian terns flew by. They generally call as they fly.

6:15 A.M. Ducks on north shore left. (20)

6:18 A.M Six geese followed same course as those of 6:03 A.M.

6:19 A.M First slight breeze from Sp. Fork Canyon way

6:23 A.M Sun on lake Mt. Just hit top at north end and 18 ducks flew north coming from Mud Lake direction.

6:24 A.M 14 ducks flew north in middle of lake

6:32 A.M. 3 geese flew south as of 6:03 A.M

6:35 A.M First swallows passing by and high.

6:36 A.M The first pelican active. It came down from the north and following around promontory lit by 3 gulls on old resting grounds S.W of Station.

6:37 A.M 6 ducks from the south flew along the end of the promontary.

6:38 A.M 8 ducks from the north flying along the shore line.

6:39 A.M. Sun now on Station.

6:40 A.M First Pelicans from Goshen Bay area flying north in middle of lake.

6:41 A.M First Cormorant from the north and let here.

6:47 A.M Pelican from the north and lit on NW side among group of gulls. This invariable happens when a small group of gulls will influence the place that a group of pelicans will choose.

6:50 A.M 4 ducks from the south. 3 pelicans flying north in center of lake.

6:51 A.M 4 pelicans flying north in center of lake. nearly all pelicans fly just above the water. One lone pelican, however and a little later flew high.

6:52 A.M The pelican that alighted first here left to the north.

6:54 A.M 9 ducks from the south flying along the shore to the north

6:55 A.M 49 " " " " " " " " " north.

7:00 A.M Counted 320 Western Grebe from a point directly south to a point directly north across the western waters. These grebe are continually heard and can be seen from the shore to a far distance out into lake. While they are mainly found generally distributed, they are also found in small groups. Early in the morning the grebe are found close to the shore line but later move out into lake away from the shore.

7:03 A.M 5 pelicans flying as those of 6:40 A.M.

7:04 A.M group of 2-3-5 pelicans as of 6:40 A.M

7:05 A.M " " 5-1 " " " " "

7:06 A.M 15 ducks from the south flying north along the shore

7:06 A.M 12 pelicans flying as of 6:40 A.M

7:08 A.M 4 " " " " " " 2 ducks from the north arrived here. Only three group of migrating swallows this morning.

7:14 A.M. Can see great strings of pelicans moving up west side of lake. They were at such a distance and mirage effect so interfered with vision, that did attempt to count. These birds were no doubt, some of those that normally flew up center of lake.

7:15 A.M 5 ducks from the south along shore line.

7:19 A.M groups of 4 and 3 ducks flying north in center of lake.

7:19 A.M 10 ducks flying north along shore

7:21 A.M 10 " " directly overhead going south

7:22 A.M groups of 1-10-17 pelicans as of 6:40 A.M

7:22 A.M Pelican left from shore to north. These are the only two pelicans that patronized this resting grounds this morning.

7:26 A.M Pelican flew by from the north but did not alight.

7:30 A.M 1 pelicans as of 6:40 A.M.

7:32 A.M 2 duck flying south along the shore

7:38 A.M. " " " north " " ". Can see 7 Great Blue Heron on shore line to east generally distributed

7:41 A.M 2 pelicans as of 6:40 A.M.

7:42 A.M → The two Great blue heron → east of here which had been there since daybreak, left on own accord toward Rock Island.

7:42 A.M Second pelican flight started of 9-1-4 grouping.

7:43 A.M Pelicans as above and of the same direction as of 6:40 A.M = 4-2-1

7:44 A.M. Pelicans as of 6:40 A.M numbering 3. Groups of 2 and 3 and 6 caspian tern let in flock of gulls N.W of Station.

7:48 A.M. Nine Pelicans as of 6:46 A.M.

7:49 A.M 18 ducks flying north in middle of lake.

7:53 A.M groups of 23-5- ducks flying south toward rock island.

7:57 A.M. 70 avocets let on gull group N.W of station. 20 remained while the others left after 5 seconds. They broke lines but reformed them. 1/2 minute later the remaining birds started to feed, preen their feathers and etc.

8:00 A.M. 1 pelican as of 6:40 A.M.

8:04 A.M Avocets left north. They were started by 3 or 4 raising their wings over back.

8:08 A.M 1 pelican as of 6:40 A.M

8:08:30 A.M 1 " " " "

8:09 A.M. 4 " " " "

8:10 A.M. Heron flying to rock island

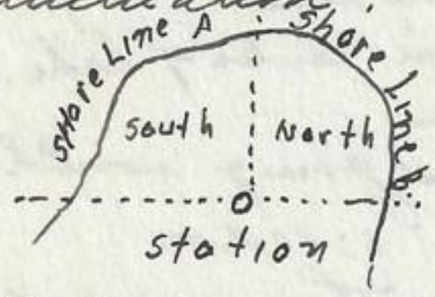
8:11 A.M. 3 pelicans and 1 cormorant as of 6:40 A.M. The pelicans allowed second position for this cormorant but did not give it full spacing. Blue Heron left and flew toward rock Island.

8:25 A.M 8 pelican from north flew south.

8:26 A.M 10 avocets from the north flying south along shore

8:26 A.M Temperature in shade = 58° - Temp in sun = 80°F

During the morning took censues of birds resting on lake shore line at end of promontory at different times to indicate fluctuation. Made two areas out of the terminal. as the other one directly south to directly west and from directly north to directly west.



	Ducks		Calif Gull.		W. Grebe		Caspian Tern.		G.B. Heron.		Cormorant.		Pelican		
	A.	B	A.	B	A.	B	A.	B	A.	B	A.	B	A.	B	
6:50	✓	✓	15	46	15	10	✓	✓	✓	2	1	✓	1	1	AREA A
7:53	✓	3	5	40	✓	✓	✓	8	✓	✓	✓	✓	✓	✓	
8:05	✓	3	7	27	✓	✓	✓	5	✓	1	1	✓	✓	✓	AREA B
8:15	✓	✓	32	13	✓ grebe must be within 100'	✓	✓	✓	✓	✓	✓	✓	✓	✓	

Such a listing does not, of course, include complete list of forms to have inhabited the lines this morning. Left here at 8:30 A.M. with not much bird activity. As I drove out of east end of Tamaracks frightened a large G.B. Heron which was on land some 300' from water. Frightened this same bird (?) from same area as I drove in last night. It flew to water and lit. In bay counted group of 16 gulls, 2 killdeer, 2 G.B. Heron and 30 ducks. On sand point north of Slaton point counted 200 gulls or so. The gulls are frequenting such points and the shore line is characterized by such groupings. 5 B. Heron in cat-tail at edge of lake some 30' from water. These same birds (?) were grouped together in a stand of cat-tails near same place. Four flickers on beach among cat-tails. These isolated groups of Cat-tails have invaded newly exposed sands and shallow waters. Picked up 2 sick ducks on beach 3 blocks south of mouth of Provo River. One pintail and 1 shoveller. The gulls had been eating shovellez and while it was able to keep head erect the ~~body~~ back, and tail was picked clean with the lower intestines exposed and contents running out of body cavity. 12 pelicans attempting to alight at mouth of river. Large group on point far to north and several dozen in bay north of mouth of river.

Birds at mouth of river and immediate shore-line.

	south side	north side.
Calf gulls	21	210
B. Egret	7	1
G.B. Heron	4	1
Ducks	2	5
Caspian T	4	18
Spot-Sandpiper	1	

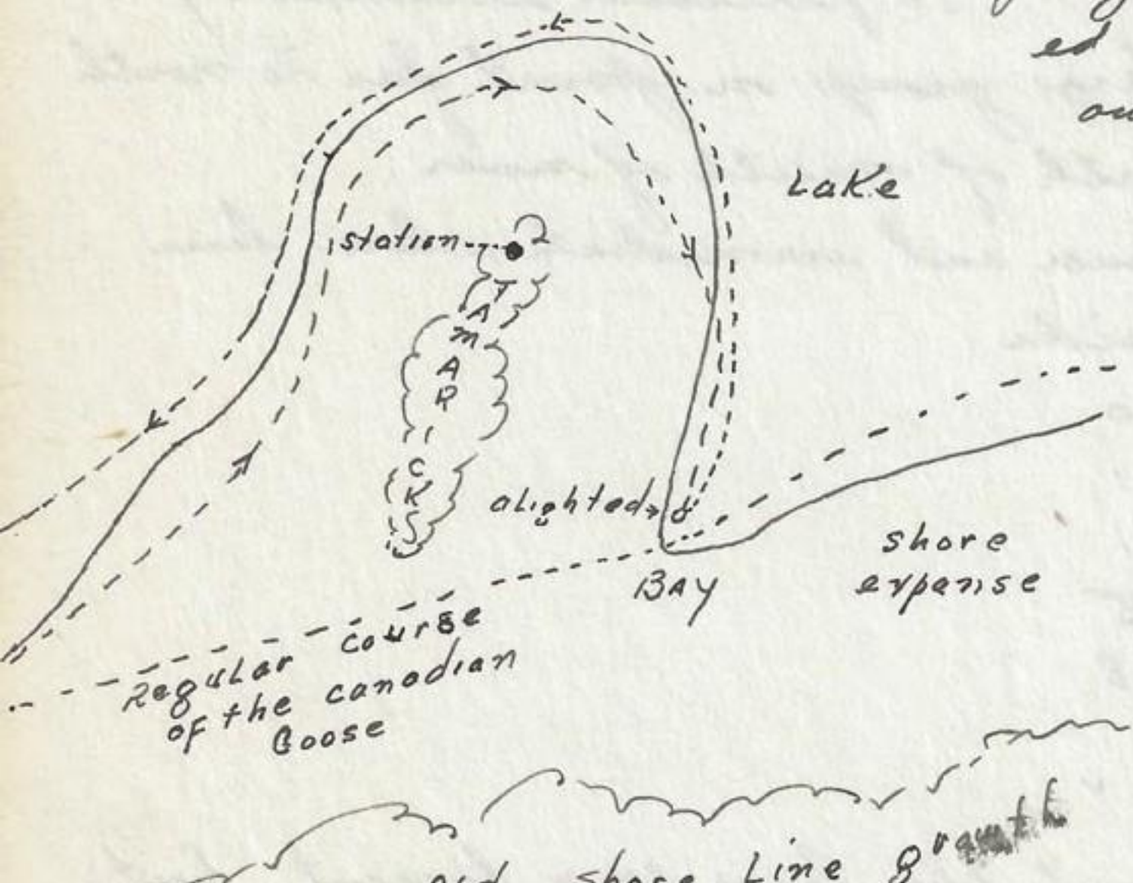
In river ~~found~~ 1/2 mile up found the large carp present but small ones gone or else they were at bottom and could not be seen. However could see bottom at places and did not see carp. Few jumping however. Small groups of Richardsonius hydrophlox (?) in schools swimming at surface of water. During the period when river supported the great numbers of carp, the minnows were generally single. Blaine Carlson reports that during the time the river was supporting such large numbers of fish in the slow deep water the fish were also found in river in great number at Cider mill at lower river bridge highway. In summing up this morning's observation can say that the normal pelican flights that I experienced here of recent days was confined to west side of lake

and could probably be due to new aeroplane activity along the east shore line in last few days. Observed 1,386 duck during observation of last night, and also heard many passing South during the nite and counted 272 this morning in small flocks.

Pelicans, Utah Lake. 9/22/40

Arrived at station, which was established on the 12th of this month, at 6:42 A.M. Groups of gulls and terns in same areas used on previous morning visits. 1 pelican already at resting grounds to the south west. Planned on recording numbers of ducks passing by this morning as well as to check upon the pelican flights. At 6:42 counted 27 calls of the adult western grebe in one minute. The young calls were not recorded as they called continually.

6:42 A.M 10 ducks flew north from the south along lake shore
6:43 A.M 24 " " " south " " north " " "
6:52 A.M 10 " " " " " " " " "
6:53 A.M 18 " " north " " south " " "
6:54 A.M 5 " " south " " north " " "
6:57 A.M 2 canadian geese left mouth of mud lake - Utah lake channel and flew around promontory shore line and then east along shore line to bay where they alighted calling as they progressed. (at 7:10 A.M they returned to channel as indicated in the outline). Temp. at 7:00 A.M = 56°F



6:58 A.M. Single pelican from the south pass to the north.
7:03 A.M 10 ducks from the south to the north
7:04 A.M 7 ducks from the south flying to the north.
7:05 A.M Single pelican from the south flying north in middle of lake.
7:06 A.M. 10 ducks from the north
7:06:20 A.M. 18 " " " "
7:06:45 A.M. 2 " " " South
7:15 A.M 4 ducks from the south flying north.
7:20 A.M 4 pelicans from the north flying south in middle of lake.
7:25 A.M. 5 ducks " " " " " along shore
7:26 A.M 11 ducks " " south " north " "
7:28 A.M 510 ducks left from mouth of channel and flew west to north side of rock island.
7:29 A.M 4 ducks from the north flying south along shore line.
7:31 A.M flocks of 22 and 16 ducks as of 7:28 AM above. These groups included mallard, teamp, pintail, shoveller and green wing teal.
7:32 A.M 32 western grebe in binocular field held at one point. as well as 4 pelican and numerous ducks.
7:35 A.M. 3 ducks from the south to the north in middle of lake.

7:35 A.m grebes calling 23 per minute.
7:40 A.m 20 ducks from the north flying south along shore line.
7:41 A.m 9 " " " south " north " " "

From 7:45 A.m to 8:01 A.m recorded the numbers and directions of flight of the gulls across a point in binocular field. Binoculars trained directly west. Birds as far as could be seen and are as:

7:45 A.m	S-S-N-S-N-N-S
7:46 A.m	S-S-S-S-S-S-S-N.
7:47 A.m	S-S-N-N-N.
7:48 A.m	S-N-N-N.
7:49 A.m	S-S-N-N
7:50 A.m	S-S-N
8:51 A.m	S-S-S-S
7:52 A.m	S-S-S-S
7:53 A.m	S-S-S-S-S
7:54 A.m	S-S-S-S-S-N-N
7:55 A.m	S-S-S-S-S-N-N
7:56 A.m	N-N-S-S-S
7:57 A.m	S-S-S-S
7:58 A.m	S-N-N S
7:59 A.m	S-S-S-S-N-N-N
8:00 A.m	S-S-S-S-N-N-N
8:01 A.m	S-S-
8:02 A.m	S-S-S-N-N.
8:03 A.m	N-S-N-S-S.

N = north direction
S = South direction
Birds flying rather high and mainly over water, however many flew along shore line. During this period 3 groups of ducks flew by as:

7:49 A.m = 21 ducks.
7:56 A.m 5 "
7:57 A.m 3 " all flying South

8:06 A.m. Six Great Blue Heron generally distributed from mouth of channel to observation station 130 ducks now on shore lines at station but have been recorded in above census. The ducks appeared to be occurring in usual numbers from 8:06 until I left but was concerned with the pelicans from here on and did not keep check on them.

8:15 A.m 20 Canadian geese flew from water some 1½ miles north of rock island as a motor boat trended toward rock island. At 8:30 A.m the above motor boat was about 8 blocks from the island and at that time the pelicans on rock island left. Could not see them resting from station here either due to curvature or their position of the north end of island. They left and flew south toward Goshen bay. The air was white and the mass stretched out from north end to south end of island. They did not leave all together but took about 1/2 minutes to leave. Estimated 2½ thousand birds. I do not know how they arrived at island unless they made their approach before I arrived this morning as there was little activity of pelican flight this visit except as indicated a few small groups and isolated birds. As a result of these birds leaving the island received a little activity here. The first pelicans to arrive were at 8:34 taking 4 minutes to ~~reach~~ make the trip. They arrived in a long line of 18 birds, then a few seconds later a group of 13 birds and then 4. 33 cormorants accompanied the first group of pelicans and retained a more or less

400921-166

distinct groups. They all lit on resting grounds which was being held down by 5 cormorant. In ten minutes the cormorant had distributed themselves out on the shore line with an average spacing of the equivalent of 3 birds. Their formation was bunched upon landing. I came later at 8:45 A.M. at 8:45 A.M 17 pelicans arrived from the north and lit upon shore line on N.W resting ground with 8 other pelican and flock of gulls. Another cormorant arrived at 8:57 A.M. and lit with other cormorant.

8:54. groups of 60 - 10 - 3 pelican lit on S.W resting grounds
8:56 " " 2 " " " " " " "
858 " " 8 " " " " " " "
858:30 " " 1 " " " " " " "
8:59 90 dowitchers (?) flew north along shore line.
9:00 1 pelican lit in S.W resting ground.
9:01 One of the cormorant left the group and flew out to a small group of pelicans swimming about 300 away and west of the main group. This was followed by other cormants which left at 9:05 A.M (2) 9:06 A.M (4) 9:07 A.M 19 cormorant left and flew out to same group as above. These birds were definitely following the pelicans around. 9:08 1 pelican arrived. At 9:10 A.M the pelicans were nearly all in their resting position when something disturbed them and they all came to attention. This attention formation was given several other times before this one. The birds left and flew out to the small group just out from them where cormorants lit to form raft in water. Birds on N.W resting grounds remained. Left station at 9:20 and when I arrived at east end of promontory found someone digging out car that had been stuck in sand. This was probably responsible for the evacuation of the pelicans from the resting grounds on the south side of promontory. However, I am sure that some attention formation is effected from only false alarms. Just south of mouth of Provo River picked up a sick shoveller which had been taken on the backs and through to the body cavity. Yellow intestinal material flowed from the punctured cavity and bird still alive and able to hold head up with eyes normal and generally alert. A pintail also was picked up and brought home where it was cured and released. These were the only two recent affected birds along entire shore line. Observed also 7 Blue Heron & 5 ~~yellow~~ red-shafted flickers on some area as observed on previous trip. In summary observed 747 ducks from 6:42 A.M to 8:04 A.M with many more after them but no specific record.

168 Pelicans arrived at station otherwise except for the disturbed

flight from rock island, the flight this → moving was decidely poor.

Completion of notes of 1-21-40

9/28/40

Recorded the following birds at mouth of Provo River. An area about 2½ acres free of ice. Remaining lake otherwise frozen tight. A cold piercing wind strong enough to create a wave on the surface of the watth. About 50 birds in all. Identified a few closer ones.

American Golden Eye. Probably about 15 birds. They travelled in pairs, singles. One male approached a female with neck outstretched and riding on surface. One group of 2 males and 1 female. These birds were confiding and were observed to be diving continually.

Buffle-Head about 18 birds travelling in groups of 1- pairs, etc. 3 ♀ in 15 ♂. One group of 1 ♂ and 1 ♀; another 1 ♂ and 5 ♀. These birds divided continually.

Mallard. 3 ♂ and 3 ♀ in one group.

Pintail several birds

Horned grebe (?)

G. B. Heron. One bird arrived from the south and lit on edge of the ice and struck a resting pose.

Calf. Gull or ringed-billed: about 12 birds

Am. pipit. Probably 8 or 9. They fed on edge of ice where wave washed surfac scum upon the edge of the ice. The birds kept on very edge and appeared to be picking up small black object either seeds or insects. Travelled in singles but frequently met at different points

There may have been other species of ducks present but could not identify because of distance away. The ducks swam up river pass me in order to gain protection from the cold winds sweeping across the waters. These observations above from about 60 minutes before sundown to sundown. A flock or two east of here hundreds of blackbirds passed south. The migration took about 3 minutes to pass. They lit in wetlans and field.

(see page 400929-150 for Sept. 25, 1940)

9/28/40

Drove down to mouth of Provo river to check on fish in river but found only a few jumping. No reaction to vibration. They did not present themselves at least. They could have been there but were not at the surface. Last few day. Cold, cloudy etc.

9/29/40

Pelicans, Utah Lake.

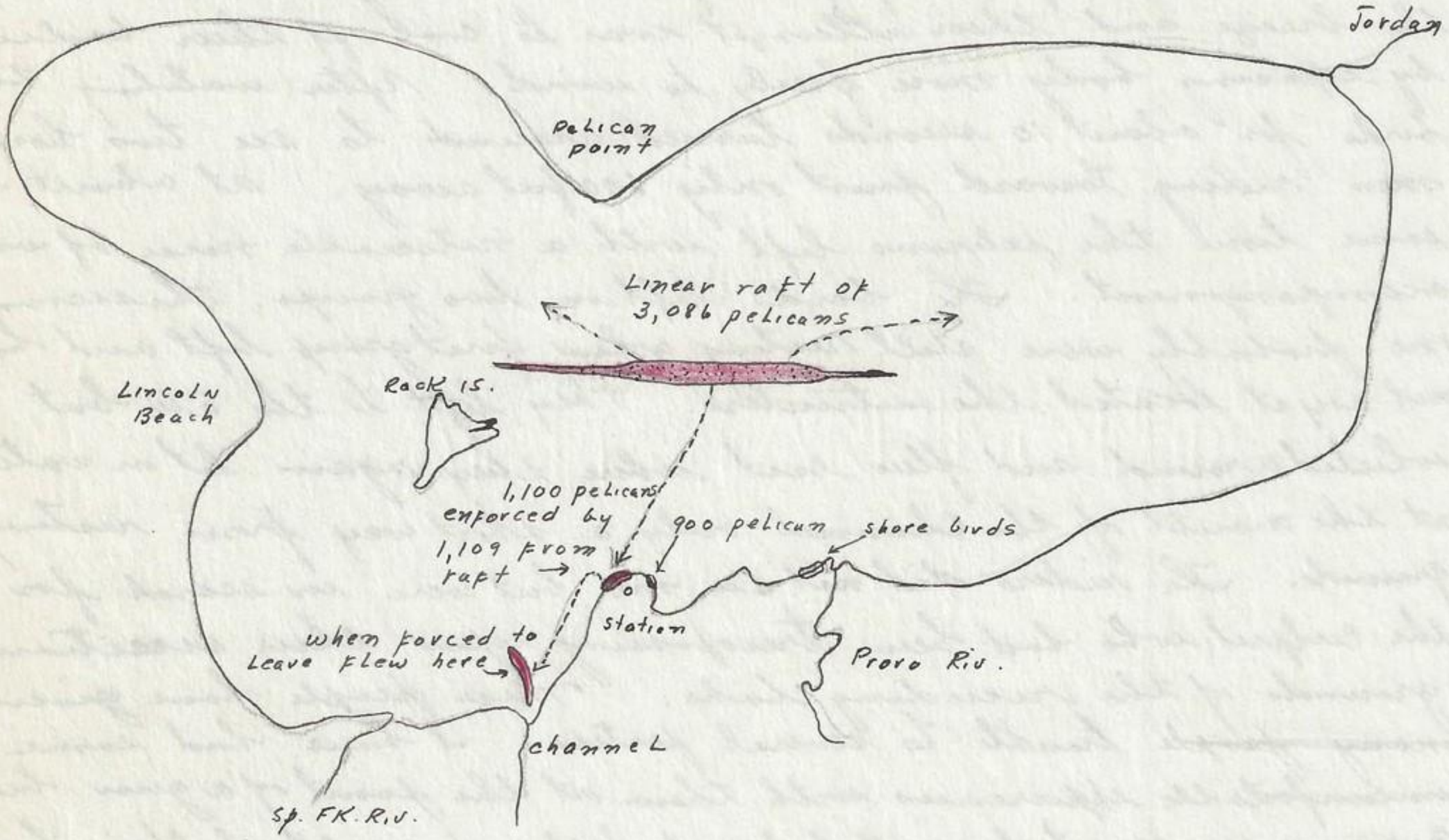
Drove down to mouth of Provo river to inspect the pelican situation on lake. On arrival at 10:30 A.M. found the pelicans

on a raft → formation on ← water some distance out from water edge. This raft of 3,086 bird, as determined by blocking and estimation, were in a long linear formation from a point directly west from mouth of river to a point south near rock island. The ends were thin but the main mass was a solid white front. It was an exceptionally long linear raft of birds and to follow along the entire length with the binocular, seemed endless.

Could see another group of pelicans on resting grounds at station area established 9/12/40. Another group toward Pelican point and others generally distributed to the N.W of Rock island. The day was absolutely quiet without surface aggitation of water which lent itself to serine comfort for the resting pelicans on the water. Such, summery like day general mean a lack of activity of bird life but found it to be reversed with more bird life in evidence. While at mouth of river observed a fishing boat preparing to leave for lake and knowing that the birds would be disturbed decided to drive down to old observation station and wait for them to arrive from water, if they decided to do so. On my arrival the birds (pelicans) on N.W resting ground left and flew out into water. They could plainly see car approach although several blocks away. The pelicans on the S.W resting grounds did not leave because the tamarix growth prevented them from seeing full approach of car. From car carefully worked out to blind without being seen by the birds. These birds now could be used as decoys for the main raft of birds on the lake, once they were forced off the water by the fishing boat. and providing they decided to come here. There were about 900 birds on N.W resting grounds and 1100 on S.W resting grounds. The birds on the S.W grounds, at 11:30 P.M after new reinforcement from raft occupied about the same area as the birds observed on the 12th of Sept. From the observation station watched and waited and at 11:03 the fishing boat approached north end of raft. The birds rose from the areas nearest boat and flew north in long unwheeling lines. As the boat proceeded south the raft gradually dissipated with the birds flying in groups in different directions. Of these birds 1109 of them lit on the S.W resting grounds, making now 2209 birds. They arrived in large groups but all flew past one point making the count accurate. The readjustment or the time of leaving raft was 25 minutes. The flocks were again stable at 11:30 A.M. except a few the isolated & scattered birds on lake. The resting birds remained until about 12:00 P.M. when

an interesting thing occured and an instance which frequently happens and which, however, should be guarded against. at 12 o'clock the birds came to a rigid attention and numerous birds began to flap their wings and some moved about. This occurrence happened at exactly the same moment that a breeze started to blow upon an otherwise quiet shore line. I immediately assumed that their nervousness and flapping of wings was merely an reaction to the breeze and their attempt was to cool off their bodies by exposing body more freely to wind. After watching these birds for about 10 seconds turned around to see two horsemen riding toward point only 300 feet away. at about the same time the pelicans left with a noticeable noise of wing accompaniment. The birds left in two groups, the second one probably were still resting when first group left and had not as yet located the intruders. They left to the S.W but wheeled around and flew east where they again lit on water at the mouth of the Channel only a short way from resting grounds. The riders did not see me but were on search for the culprit who had been trespassing upon their recreational grounds of the receeding lake. These people have given trouble to several parties. I have had some uncomfortable experiences with them at the point of a gun but the pelicans ~~are~~ must be watched and followed inspit of their lack of concern as to who's property they come to rest upon. The waters off the lake had been blown upon the broad bare expanse of the sandy beach by some strong westerly wind in days past and the route across such grounds was problematical as to whether one might sink in muds or stick in sand blown reefs. A great change has occured since the 12th of Sept when the beach was nearly homogeneously smooth and safe to travel The water had nearly reached the growth on station promontory. Lake still going down and is now critically low. On returned trip observed the usual congregation of gulls at different points. Small group of 12 Brewster egret in Bay. 7 Great Blue along shore line between station and mouth of river. 3 blocks south of the mouth of Provo river observed 32 killdeer feeding along shore line. 2 blocks south of river 40 killdeer passed south in one flock. At 1 block south of Provo river counted 79 killdeer, 2 semipalmated plover, several western sandpiper feeding in small bay. The river had been dredged an the muds and silt had moved south along shore lake to creat this feeding area.

The semipalmated plover runs like snowy flower but with greater speed and endurance. These fast move with incredible speed. they choose the drier beach only a few feet however from the water. The western feed in irregularities of beach at water edge as well as in water. Shorebirds have been exceedingly rare of previous visits.



Orientation of pelican activity today.

Observed also today for the first time since Sept 10th when I began observations, the forster tern. The Caspian and gulls still present. In tamarisk growth at station observed a flock of 210 am. pipit as well as several warblers in migration. The pipit left the tamaricks. The total pelican count this morning is:

3,086	in raft
1,100	on S.W resting grounds
900	" N W " "
500	generally distributed to the west, + south beyond raft
5,586	pelicans

This fegure is based on very accurate counts and estimations and if anything is conservative in number.

Provo Peak, Wasatch Mts. (see page 400921-147 for proper entry) Entered Sept. 30, 1940 date 9/5/40

Made hurried trip to base of Provo Peak and return. Itenerary included: Base of trail at foot of mt. on Bonneville level at 6:55 A.M; up trail to devils gate at 8:00 A.M; point where Maple flat trails leaves main trail at 8:25 A.M.; Continuing up slide canyon to spring at sheep flat or Bear flat at 9:10 A.M; Continued south to divide looking down into slate at 9:30 A.M.; hence up east ridge to a point above chokecherry trees and then on trail that leads around this mountain to divide looking directly down on cold springs, arriving here at 9:45 A.M

400930-1.71

Left here at 10:20 A.M and return to divide as of 9:30 A.M and then up over maple flat mt to maple flat to here as of 9:30 A.M and spring to point as of 8:25 A.M ; here down regular trail to car. Day clouded around mountains but clear to west.

Birds observed:

Batchelder Woodpecker : observed 2 or 3 at sheep flat.

Hairy Woodpecker. 4 or 5 along course mainly up slide and in vicinity of sheep flats

Juncos Generally distributed. (common)

Robins Indication of migration along Wasatch front but not noticeable back in range. one flock of 32 birds flew to south at the Y. on the front. Seen on Oquirrh range at 7:21 A.M. being late because of cloud interference along Wasatch.

Red-tail hawk. Two birds at cold springs flying together. They gradually gained elevation and circled high above.

Sharp-shin. One flew north near divide west of cold springs. The hawks were few and indicated no migration

Golden eagle 2 birds flying along mt south of the divide of first left hand of Slate canyon.

Pine-siskin. One group of birds

Aud. warblers. Intense migration in general but mainly in aspen grove in vicinty of sheep flats

Utah Jay. a few mainly in Slide. From the devils gate the woodhouse is generally replaced by the Utah Jay.

Clarkes Crow. One group and few individuals.

nuthatch (red-breasted?) Frequently heard and associated with warblers. The canyon of upper slide that enters sheep flat was main migration lane.

Woodhouse Jay. One front of range

Mt. Bluebird. Few on ridge west of Cold Springs

Solitaire " " " " " " "

Other warblers were present but could not identify positively.

no marked migration of hawks as of last trip on Mt. Timpanogos.

Could see the pelicans from Maple flat mountain. They were congregated on rock island on the west shore - north end and peninsula running S.W of island. Also a small group on first point south of mouth of Provo river, one small group South of Geneva in lake.

Mammals observed

Deer. numerous tracks from 8:25 A.M on up slide. The deer were found in association with aspen and tracks in trail at all points. The north and west side of maple flat mt used for bedding grounds.

Thomomys. Tracks in snow

Eut. d. utahensis One, face of mt.

Eut. m. conss Heard but did not see

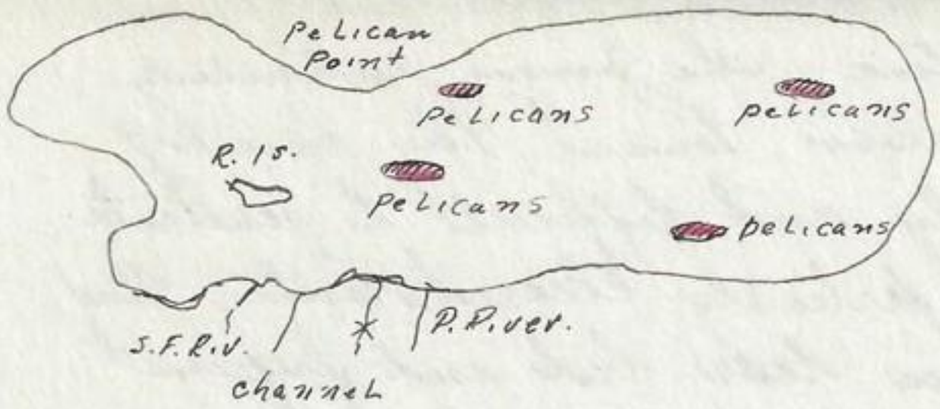
Eut. umbrinus Watched one call squirrels from fir tree.

Tamiasciurus h. ventorum 400930-172 Few called near Sheep Flat springs
no grouse or Citellus armatus in evidence
Ste Sceiophorus graciosus graciosus were out on returno trip
The greatest percentage berry about 1 1/2 inches long. Grass-
hoppers associated with lizards. Met two young boys on re-
turn who claim they had killed 3 rattlesnakes near devils
kitchen. Chokecherries perfect some long ◯ this size
Elder berries ok. service berries dried or gone. aspen leaves
predominately yellow and still on trees, however few trees
bare and ground covered. The north side of last hill among
conifers about 60% leaves and 40% bare. The golden yellow
leaves on dark ground among conifers an unusual site.
The vegetation is coming back since sheep have been
prohibited. The sheep flat near spring has, in the last
4 or 5 years supported several dominant plants, each varying
according to the year. a most drastic change having taken
place. On the first flat of slide canyon where trail leads to
maple flat one finds now grasses 4' and 5' high. It central the
flat with very little other vegetation present. of years past
at this same time have found the flat at one year dominated
by nigger-heads, others years by stinging nettle etc. The old
chenopians weeds are still found being crowded out by the
grasses. Snow present in protected places from this
flat on. Gophers active. the entire route. Springs
as usual. Sever erosion at base of mountains and below
Y. The erosional scars on Provo Peak are being checked
by invading vegetation. One dense growth having invaded
about 1/3 way from top of gullies. General cold brown
and red with green still clinging on. The rock colors, however,
have passed on except in few spots. Maple leaves in general
are gone and trees bare. Found name of Tom Gessford 1925
on aspen below sheep-springs. Mt ash leave mainly gone
with berries a deep red. not as orange as general. No recent
Badger diggings. Coyote tracks present. On return trip found
bees in conifers. few butterflies. Can see breath nearly all
time. I know of no prettier trip than this one, a trip
when continued down rock canyon is not too long a trip.
to tire one.

9/30/40
Utah Lake.
Found at mouth of Provo River 133 pempalmated (?), 23 least (?),
and 35 killdeer. Toward sundown and birds preening
increase activity. Marsh hawks disturbs them.
Snow on mountain to maple flat level. persisted next day 10/3/40
nearly gone on the 5th except in protected places.

Pelicans, Utah Lake. 401008-173 10/8/40

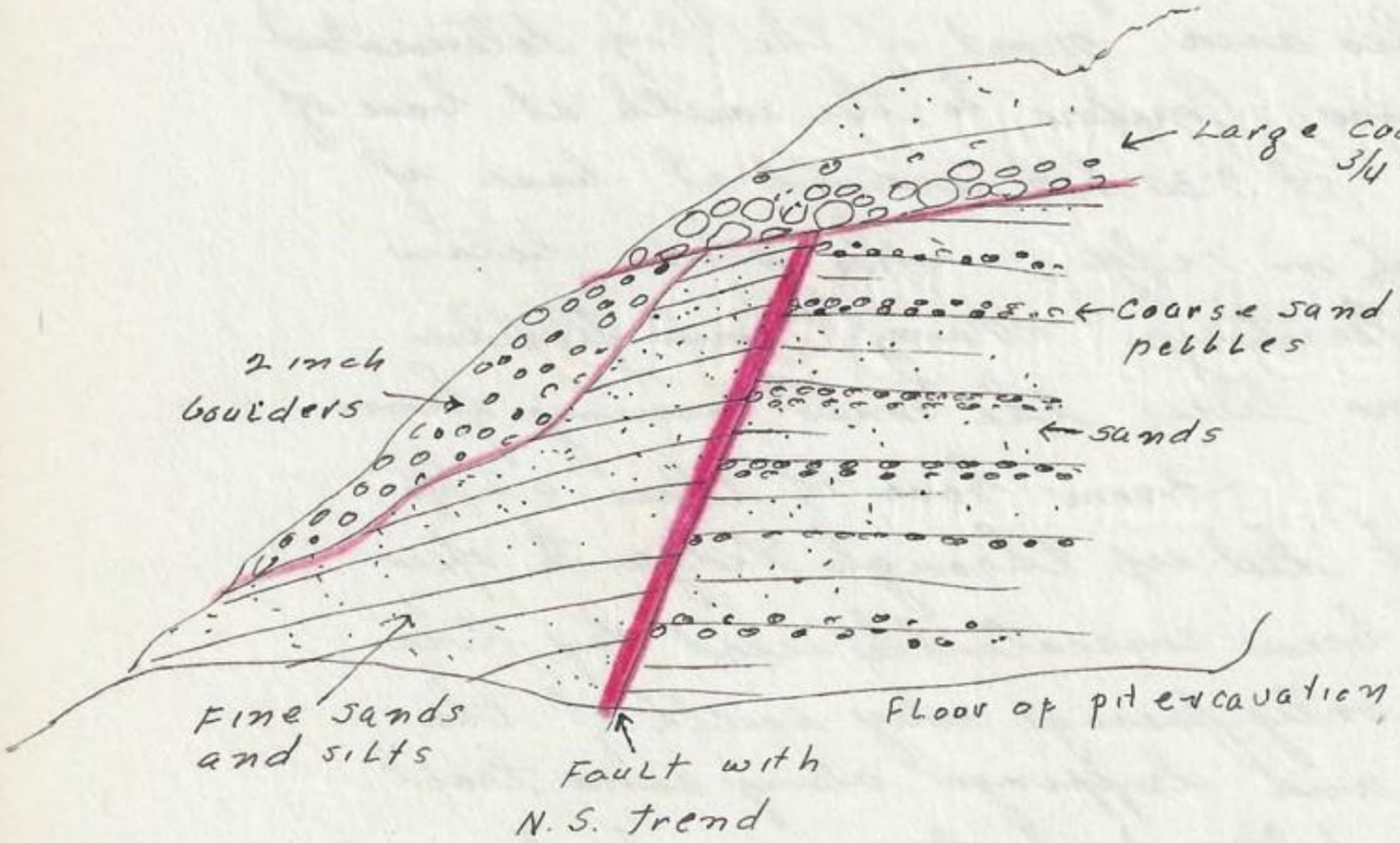
From mountains east of Provo could see the pelicans on Utah lake: They were congregated in four rafts on water. No birds on shoreline, nor on rock island as far as I could tell Their aggregate would probably make a total of 4.000 birds but from this distance would be unsafe to say or even estimate.



This observation was made at 11: oclock A.M.

10/8/40
The aspen grove directly above middle section of maple flat has turned yellow at its lower limit. The upper limit has passed beyond yellow while the center portion is still green. The aspen groves north of this one have been yellow for some time. The aspen in general on mountains to the east are yellow.

10/8/40
Examined a faulted section lower of L. Bonneville sediments just north of slate Can. Faulted section examined in pit: 15' The cross section here is east-west. The faulted section smooth and straight where exposed at different parts of the pit. Situated above road at north end of City trash pile.



Cascade mts, Utah Co., Utah. 10/12/40

Dwight Taylor and I made trip to Cascade. The objective was to check upon the deer and dusky grouse. Left Provo and drove to head of Pole Canyon via of Provo Canyon and Pole Canyon. From divide of Pole Canyon and 2nd left hand fork of Rock made ascent of the Cascades. Near bottom of Pole Canyon near main highway observed a cottontail along side of road. A short ways beyond here among the artemisia, Quercus saw 1 jack rabbit. Daybreak at 5:25 A.M. Arrived at Divide at 5:55 A.M with lights just right for trail. One block down from divide found 1 buck standing in road at 5:53 A.M a large one about 180 lbs. It left lights of car and ran south toward divide. Also observed another buck at about 5:45 standing along side of road in aspens. Neither of these bucks appeared to be overpeated by lights of the car. The early morning lights

were → emphasized in Provo → Canyon where lights were allowed to enter the valley through the canyon itself. Left divide at 5:58 and went east along the divide ridge, up base of Cascades and made entrance to upper slopes via of first accessible route to the north. at 6:15 A.M heard a few birds active. The Juncos particularly. One grouse left divide. Contenued up the slopes toward the base of the Cascade. These slopes are very brushy and difficult to penetrate. Frequently one comes to flat portions with partially cleared route. Over these brushy hill slopes found numerous deer beds and frequent fresh signs of deer. Definetly observed one trail with 5 sets of deer tracks. Other single tracks at other points. 6:25 A.M. Audubon Warblers and Bluebirds. 6:38 Sun on top of Oquirrh range. 645 A.M. Temperature = 47°F Magpies, Hairy woodpecker, Aud. warblers and Chickadee in evidence and calling. a few siskin. Interesting rock slide to right. Considerable evidence of burnt conifer trees as if fire had at one time range up through this area. Most of the logs deteriorated but some still in good preservation. Conifers to the south at base of mt not so effected by fire. at 7:30 A.M arrived at base of cliffs. Clarks Crow called high on ridge. This slope below cliffs is indeed a good deer territory. Many Pinus flexilis cones along this slope but no trees. the cones coming from above the cliffs in the main. From base of these cliffs found a good deer trail that led up through ledges to open slopes above. This trail had been consistently used by the deer and was practically the only passage way south of the first canyon. Coyotes tracks and droppings along some trail. One changes abruptly from two different situations as he leaves the talus slopes so to speak of the Cascades and enteres the cliff and open slopes above. The first thing one observes is the presence of the conifer trees and the wild life associated with them. The trees now are predominately Pseudosuga and Pinus flexilis. On the lower slopes the tree is principally the Pseudsuga but on the more rocky situation the Pinus flexilis comes into dominance. On the north slopes of the ridges one finds the Abies concolor. It is interesting to note the apparent lack of this tree on exposures dominated by the Pseuds-and flexilis. On good north exposures and higher up on mountain one finds the Pinus engelmanni and Pinus ponderosa. Abies lasiocarpa no doubt present. Would say that the Douglas fir is the dominant tree but flexilis dominant in proper exposures and rocky situations. Ground solid and light film of frost. Plants mainly brown. at 7:40 A.M heard a Cat. umbrinus and

and watched another one in a Pseudsuga → working over the cones. It would inspect on cone after the other and it appeared to me that it was smelling the cones rather than attempting to eat them as the visits to each cone was too rushed to make more than a olfactory contact. It seemed particularly interested in the scales of the cone. At the base of this tree and at the bases of many other trees found the eaten cones with only the apis and base of scales left. It appeared highly possible that these chipmunks brought their cones to the base of the tree to eat, rather than husking their life out on a limbs so conpicuous to the hawks. Observed also a few grey-headed Juncos and chickadees. The clark Crows at this time of morning were calling every minute or so. At 7:50 A.M. met a flock of mixed birds feeding among the Pseudsuga and working progressively south. This gregarious group included: Juncos, mt chickadees, kinglets (western Cr.) and audubon warblers. One Eut. umbrinus in Abies concolor. Coyote tracks and signs in evidence. 7:51 1.M. 2 dusky grouse left from lower limbs and flew up into top of tree. 7:56 1.M at first main Conyon Crossing. Noticeable breeze in bottom of conyon gulch. From here trended north and slightly up with the intention of intercepting the many conyons to the north and then finally to work up to top of ridge at north end. 8:05 Ridge at flat portion. 8:10 A.M 2 Eut umbrinus. 8:12 1.M 2 Eut umbrinus and 1 Utah Jay 8:14 A.M 5 doe moving ahead of us along some trail. about 300' While watching these deer observed a red-tail hawk dropping down slope of mountain with partially closed wings. It fumbled on a conifer tree as if it had taken a chipmunk and then flew away. It is very likely that it was hunting for these chipmunks which were found frequently on the exposed outer limbs of the conifers. 8:21 One Eut. umbrinus and 2 Tamiasciurus calling. 8:30 A.M Dusky left and flew down slope among conifers. 8:33 1.M Dusky flew down slope. 8:35. 1.M A Dusky sailed south and down from the north being unaffected by our appearance. Its flight was started somewhere to the north without our presence being the factor. 8:37 A.M Conyon bottom. Good rock slide with two cove at head Aspen trees on north edge of slide. Followed deer trail across slide. Small bush-like maples with leaves practically gone. 8:41 On other side of slide found deer bed with aspen tree and small conifer tree scared by horn rubbing. Juncos and 2 Eut. umbrinus here. 8:44. Ridge on flat portion.

8:45 A.M. 401012-176 → 2 dusky grouse ← chickadee-kinglet group. Have noticed several badger holes but nothing recent. 8:55 1 dusky grouse 8:58 A.M 2 dusky grouse. These grouse are on ground and when approached they fly up and then sail down mt. side. 9:00 A.M one three point buck in good shape. almost fearless and approached us, then stood on paint for sometime and finally decided to leave after making us believe he was going to approach us. 9:02 bottom of canyon. 901 AM: 2 dusky grouse 9:12 ridge. 2 Tamascaurus observed near each other and calling 2 Cut umbrinus 922 1 Dusky. 3 Cut umbrinus. 1 doe. 9:26 A.M 2 dusky grouse. 9:30 bottom of canyon 9:50 1 white breasted Nuthatch very concerned about our presence and returned after having left us. 2 Cut umbrinus 10:02 ridge above highly eroded cliffs. This ridge leads up to the second peak on cascade from the north end. Continued up this ridge and found 2 unscalable cliffs directly on ridge. Pinus flexilis dominant. 10:05 Tamascaurus and Cut umbrinus calling. Having top cut across to top ridge between two first peaks 2 large buck left from conifer growth at 10:40 A.M 5 minutes later another large buck left and ran north over ridge below north peak. The first two deer would weigh about 220 while the third one would probably weigh 290 lbs. very large antlers. Arrived at top at 10:55 P.M. From this pass went north to end of ridge at highest point arriving at 11:00 Country to east an cirque dry and barren looking. Interesting view of Mt Timp. perspective flat however. Smoke in Utah valley but clear in Heber valley. Smoke up rock and over windy pass. Snow on uintahs and on north exposure on cascades some places 2-3 inches. Slight drift on lee of top ridge. Left the north end of Cascade at 11:15 A.M and followed south to south end of cascade. This mt-top makes a nice trail along the crest without too abrupt decents or ascents between passes and peaks. The entire coarse taking only 1½ hours. Only birds observed on top were siskins and 1 sharp-shinned hawk. Deer trail on top. The deer in several cases crossed ridge. The dominant tree on top is Pinus flexilis. The dwarfed conifers hugging the slopes make ideal bedding grounds for the buck deer. Have observed that they consistently use the upper or lee slopes of the conifer growth as bedding grounds and trails and indicates that this constant use of the upper limits of such growth, prohibits their dispersal up hill. This reaction upon the conifer growth may account for the characteristic

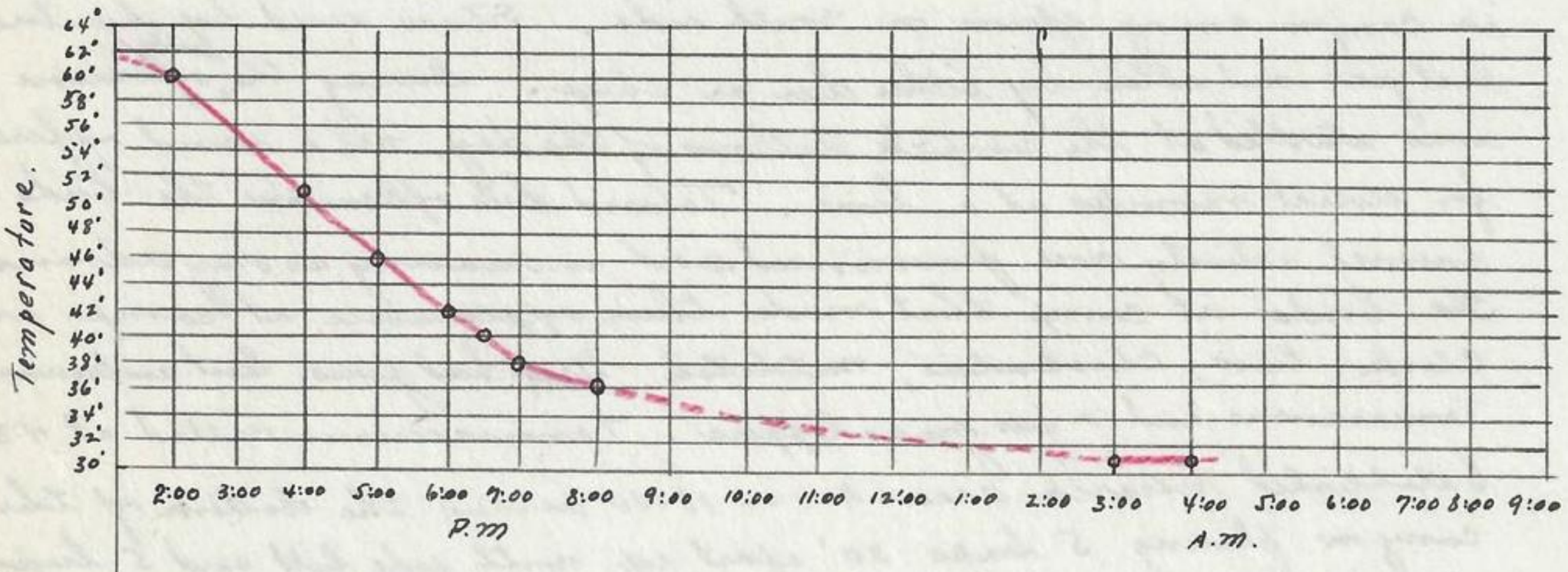
lateral or horizontal trend. If such a → growth pattern is → prevalent on a mountain side, and if not governed by rock structure would assume that deer, elk, mt. sheep etc have been or are now found in good numbers. While the Pinus flexilis is most frequently found on top, the douglas fir, Engelmann spruce. etc are found just below top making up the dense and dwarfed masses. 11:25 Pass 11:34 Peak 11:55 Pass above old camp of previous years 12:00 top of peak. 12:10 A.M 2 buck left just down from ridge. 1 extra large one left shortly after. Utah Jay associated with deer These deer were all large probably ranging 200 lbs - 200 lbs and 250 lbs. with beautiful horns. 12:15 Pass porcupine gnawings everdence. 1 active gopher. Few of these animals but not many. 12:28 Top of last high prominent peak. 1 small buck or rather large but small in comparison with other bucks left and ran down west slope. 1 extra large buck with large set of antlers, pointed face and black tone to face left and ran south to last point of cascade then down windy ridge for a few hundred feet and then dropped down in to cirque, running across slide rock directly below us. This deer followed the circular escape so many deer indulge in. This deer would probably weigh 300 lbs. Arrived at south end of Cacades at 12:45 A.M at point where one looks down into rocky canyon. Remained here until 1:52 P.M. From observing the deer today find that they inhabit two zones on the mountain; one just above precipetous west cliffs of the cascades and the other just under the ridge on top among the dwarft conifer growth. The old and large bucks are found in this high zones while the does seem to favor the timber below. Have never failed to find large bucks in this upper zone. Definite ~~fore~~ trail mark this upper zone. It may be used because of the inaccessability from west and quick escape to the east side of Cascades to cirques. Large buck invariably love such a combination for protection. One butterfly on top and a few Asilid flies. Observed again the interesting fold east of Provo Peak. Left the south peak at 1:52 P.M after taking temperature of 68° F in the shade. Followed down west ridge to prominent point then north north slope to point where we gained entrance to

Cascade. 401012-178 A definite trail leads for
→ slopes this morning.
several block down to this gateway from the upper slopes
to Pole Canyon. Many coyote tracks and droppings in evidence
along entire route. Also found 5 more Eutamias umbrinus and
one Eutm. consobrinus on return. Consobrinus was found about
3 blocks down from top. 2 more dusky grouse to list.
Arrived at car at pole canyon pass at 3:27 P.M. Slat of
Pole canyon coarsely plowed, probably for receeding or
crossing control. The animal and bird lists were only
as complete as time would allow. From top of mt observed
the pelican on lake in raft out from point at Salvieux.
This morning snake arranged itself in several distinct
horizontal layers on all valley to the west but none
to the east of Wasatch Range except near Solduc
summit direction where the smoke and haze had probably
pass through mts or as a result of trains in canyon. Sky
clondless and practically no wind on top. In partial
summary saw 11 large buck and 6 does with signs and fresh
trails indicating at least that many more. Definitely saw,
however 17 deer today. Also saw 23 Eutamias umbrinus
and 17 dusky grouse. and 5 Tamiasciurus h. ventorum
as well as others species as indicated in notes of less importance

Deer Trip to Indian Springs, Indian Cr. SW Strawberry Reservoir. 401018-179 10/18/40
Station at Indian Springs. Left Provo in time to reach camp about 1:00 A.M. In the upper head of Sheep Canyon found the hillside colorless with tree leaves dead or off. The oaks with trees either bare but generally still retaining the dry, curled and wrinkled leaves. Would say that probably 50% of the dead oak leaves were still remaining on tree. The maple trees are generally or consistently bare, however, a few trees still retaining dry leaves no colors present except dry dull faded brown. no green from tree foliage. The aspen trees ~~dead~~ without leaves on all exposures except in the bottom of the main canyon where they were still yellow. Crater to west of Sheep Creek very interesting. Arrived at camp at 1:00 P.M. and soon had camp in order. no hunters on route. Country dry in appearance with no snow in evidence even in protected places, however, the soils damp in canyon among spruce on south side. Straw used by hunters last year not eaten by either deer or sheep. During the early afternoon was startled at the complete dullness of the day, not a sound offered for several minutes at a time. Toward late afternoon the birds and animal activity more pronounced and increasing as day advanced. The birds at camp that made their appearance at camp are: Clarks Crow, Chickadees, nuthatch, Gray-head junco, Ent. emberiza, Tamiascurus and a few grasshoppers. Tamiascurus called at 4:30 P.M. Established research area 4-10-18-40 across the bottom of the canyon placing 5 traps 20' apart up north side hill and 5 traps 20' apart up south side hill. North side hill open and rather steep, with Symphoricarpus, aspen and Pinus flexilis. South side of Spruce, aspen, a typical Cleithronomys and Phenacomys territory. Checks on these traps every morning and nite and at the end of the 4th day ~~found only~~ had one Peromyscus to the good. It measured: 172 m.m long, 81 m.m. tail, 19 m.m foot. ♀. From my notes of two years ago from this same area supporting several Peromyscus. at Camp we had trouble with mice and ~~factions~~ even on our daily hunts frequently observed Microtis like mice activity during the day. That was ~~last year~~ 2 years ago. but this year there appeared to be a decided lack of mice of any form. However observed this year at several places the tracks of mice made during the nite but nothing compared to the trails and evidence of mice the trip of 2 years ago. It would indicate that from general observations that the mice population of 2 years ago was at an optimum but this year at a low ebb in population numbers. The temperatures appear to be in contrast so will

enclude → temperature range → of this trip to be compared with those of 2 years ago. Temperatures of the 18th are: 200 P.M = 60°F, 4:00 P.M = 51°F, 5:00 P.M = 46°F, 6:00 P.M = 42°F, 630 P.M = 40°F, 700PM=38°F, 8:00 P.M=36°F day clear without Clouds. On the 19th the temperatures are: 300 A.M = 31°F, 4:00 A.M = 31°F, 7:00 P.M = 38°F, 8 P.M = 36°F. day clear without clouds. On the 20th the temperatures in afternoon were in general 1/2 degrees lower than 1st day. On the 21st the temperature are: 500 P.M = 47°F, 7:00 P.M = 38°F. Clouded for the first time. The temperatures of the first day and next morning are indicated to show typical curve: all temperatures taken at Camp on south side of canyon where sun rarely struck and which supported a spruce forest. Temperature from edge of forest in Canyon floor 150' above road crossing of creek above Spring or about 400' above spring itself.

Temperature Curve.



Assume that day temperatures are close to 60°F but did not have opportunity to check at that time of day: at 5:45 P.M a Eut. umbrinus and chukaka called. Tamiasciurus called up until 6:10 P.M after. which they were silent. Great Horn Owl flew by at 6:15 P.M. Very little evidence of deer in immediate vicinity of Camp.

Deer Trip (Continued) 10/19/40

Morning star (Venus) just coming over east ridge at 3:55 A.M. 4:30 A.M G.H. Owl called from south side of canyon. Left camp at 4:40 A.M just about 3/4 hours too soon. Daybreak at 5:30 A.M. 5:45 Coturnix called. 6:10 lights ok for hunting. 6:50 A.M Sun struck simultaneous on high Peak to west and on Lone Sheep Knoll. The first shot was fired at 6:30 A.M and before 7:00 A.M 83 shots had been fired by hunters in area as far as could be heard. The siskin are the first birds in evidence and flew by at 6:30 P.M. Today spent around Lone-Sheep Knoll, head of 3rd water and down ridge to aspen timber and brink of high country between 2nd & 3rd water hence back again to camp. At spring in aspen parkland found the bear tracks, large and fresh. Have found these

here every year. The bear walked on the grassy knolls among the boggy spring. Other forms observed during the day are: One nearly white snowshoe rabbit, 35 does, 5 bucks, Cooper hawk, Utah Jay, ~~Canad~~ R. Mt Jay, Gray headed Junco, Sisken, Hawk, Hairy, R.B. nuthatch, Gophers. while waiting shortly after good lights this morning had a Cooper hawk come directly toward me but swerved off at about 20'. Few patches of porcupine hair scattered among timber as if had been eaten. At the bear springs heard 5 coyotes calling. They offered their usual call but, was so ideally situated that I heard other secondary calls that are not usually heard. The calls first started across the canyon among the oaks but was soon picked up by coyotes on my side of the canyon where they were ignorant of my presence. Sun set on Wasatch Range at 5:38 P.M. after sundown one has about 25 minutes of hunting left before twilight prohibits visibility except at 20' & 30' feet.

Deer Hunt (Continued.) 10-20-40

Today covered about same area as yesterday. measured one Abies concolor above bear springs just above last abondoned ancient spring slop or bench which measured 171 inches in circumference at 3' above ground. True regular nearly to base of roots. measured many others being 3' - 3½' - 4' in diameter. During the day observed 12 ruffed grouse in the following grouping - 2-2-2-1-1-2-2 The deer observed during course of day are: ♀♀ - ? - ♂ - ♀♀ - ♂♀ - ♂-♂-♀ - ♀♀ - ????? Porky tracks frequently found in trail. The grey ruffed grouse was observed feeding among aspen leaves this morning before lights were sufficient intense to allow for clear identification. One flew up into an aspen tree and after a few minutes dropped down to leaves again. Instead of dropping down on an angle it dropped directly down and being 12' above ground it hit with an unexpected thud. This morning shot 5 shells at a buck the shells lighting within 1 or 2 feet but it did not move. After the 5th shot it very carefully drew back into timber. It was below in clearing among aspen & conifers. This has been the case several times when bucks remain still even with shell striking the ground around it. A Cut. umbrinus came to spring and drank for several seconds in evening. Heard today a call like the Tamiasciurus but more like a car horn. It could be a variation of the Treesquirrel. Found a dead snow shoe with 3/4 white pelage. Hind foot measured 152 m.m. Many aspen trees 60 inches in circumference. Several fresh badger holes, many old ones. Saw 15 does and 3 bucks. Usual birds and animals observed today. First days without bagging deer. 2nd day 1, 3rd day 1

The one I 401020-182 lbs. Dads weighed 165 lbs. One can
carry a 150 lb deer (shot weighed 104) on a stretcher without serious effects the day after.

Deer Hunt (continued). 10/22/40

Left this morning. Took picture no. (1-10-22-40) of the camp
left by a part of 4 camped below us. Such a site is the
general rule. Absolutely
no regard for those who
may come after. It
indicates that the sportsmen
program is not getting
over to their membership
the training and thinking
that is inducive to a
higher and more permenant
1-10-22-40
value. It indicates that the education of the younger generation
of a better appreciation for our great out-of-door is our only salvat-
ion. Such a ruthless devastation and cluttering up of an other-
wise beautiful canyon floor should be punishable to the greatest
degree. Education I'm sure would not be of any effect to such a
group. The name Indian Springs as applies to this area at present
would be a disgrace to any Chief. The area is overgroged with
the gully entrenchment draining the water from the roots of the
willows resulting in the death of these forms. Nothing remains but
the dead butts of these willows. Did not keep specific record
of observations of birds and mammals as will indicate in a general
summary of forms observed on this trip in immediate vicenity of
hunting territory comprising Indian Springs and in general 2 miles to the
N.W from springs. No observations or trips to east, south of Springs:
Roll calls is:

Goshawk: Only observed one bird flying ~~east~~ north from lone
sheep knoll. The country is ideal for goshawks but failed to
see more than one nest or any evidence of goshawk depredation.

Coopers Hawk: One bird observed (see notes)

Thrush: Probably Aud. Hermit. Observed at least 1 or 2 of these
birds every day but consider them uncommon. No singing heard.

Grey-hooded Junco. Common bird generally found at edges of
the spruce growths, particularly in the late evening when one
finds them feeding and probably preparing to enter trees for nite
These spruce thickets are dense and dark with very little life;
The peripheral edges are favorite place for these juncos. Traveling
in small groups and giving their characteristic calls.

Pine siskin: Common bird. A bird found early in the morning before sun arrives generally flying high accross the area. It is the first active bird in the morning.

R. Mt. Jay: Common and generally distributed. Frequently would see 10 or 12 a day. They were more frequently found associated with the conifer stands but among the aspen stands as well. They are f either found alone or in company with the Utah Jay. Pairs or 3 were most common numbers in group. Why these birds should not be found in the Wasatch range to the west is indeed a problem. I do not see any reason why they should not be found there because the habitat is, from all general appearance nearly the same except the degree of extensiveness. This jay is practically fearless and will approach one within 12 feet and help itself to the fat of a deer that one may be cleaning at the time. In many cases they would even approach near. Their flight and activity among the trees and on the ground is accomplished without effort and their movements delicate and as light as a feather. When leaving the ground one hears a noticeable wing vibration as they fly up into the branches of the trees. This flight is effected at a 80° angle from the horizontal. One could readily see that the confidence this bird places in man is to its own disadvantage.

Utah Jay. about as common as the R. Mt. Jay and frequently associated with it. It offers its usual calls and seemed to favor the Goshawk imitation call:

Poor-will. Generally one bird heard early each morning.

G. H. Owl. Observed one bird but heard their calls in the evening and early morning. They prefered the dense conifer stands. no evidence of depredation.

Mt. Chickadee. Frequently heard in conyons and at camp traveling in small groups.

L. T. Chickadee. 1 bird.

R. B. Nuthatch. Calls most frequently heard.

Magpie this bird was common, seeing 6 or 7 a day. It is truely a bird of the aspen country as it appeared very much at home here. These birds, as well as the two jays followed the deer in their activity and were telltales in this respect. Found that the nuthatches were good indicators of intrusion. Also the Eutamias and Tamiasciurus generally let one know he was in their territory

Hairy Woodpecker. Heard a saw a few birds

Clarks Nutcracker. Met up with six groups of these birds during the four days but may have been duplicates. They are more frequently heard than seen.

most impressive thing was their lack of any
Grey-ruffed grouse. The most ↑
large group formation, nearly always being found in pairs or singles
these birds commence feeding long before the other birds in the
morning and generally among the dry aspen leaves where they make
considerable noise. Their distribution is general and not localized.

Grosbeak (R. Mt). no doubt present but did not see it but
thought I heard it.

Shrike Large shrike lit in top of Conifer at head of second water
near Lone-Sheep Kenall.

Hawk. Only observed this one and probably a Swainson. Large
hawks of the soaring type are indeed rare here at this time of year.

Mt. Bluebird. One bird in lower Sheep Creek.

Bear. 2 reported taken from this area.

Deer. The country in the immediate vicinity of camp of years
past has alway been a productive area with many signs and
evidences of deer as well as many deer themselves but this
year the area was supporting very few deer. There appeared
to be many deer taken from this country but in these last
remaining areas where the deer have remained because of
difficulty of hunting. Now with an increase army of hunters
and their organized driving methods these last stands are being
invaded and the deer taken. Any apparent increase of deer
for this country is probably due to the increased hunting to
the west and adjacent country where the new road of last
years has allowed many hunters to approach the west than of the
few years before. From my observations would say that the buck
population, at least the large animals, have steadily decreased
every year since we started hunting here. and any apparent in-
crease can be explained as invasion from contigent areas.
With new roads into all parts of the country allowing for better and
easy accessibility and with better marksmanship and ruthless
sportsmanship the buck population is doomed to decrease
out of all proportions to what it should be for sex ~~ratio~~ ratio.

Badger. Many holes with few very fresh ones. Most of these
holes are have dirt mounds of about a gallon capacity indicating
shallow digging. Others with extensive digging. Some areas
have 5-or 6 holes in same area.

Peromyscus. minimum level from all indications.

Eutamias umbrinus Common. Frequently heard and seen. Most
frequently associated with Conifer and tree stands.

Bobcat (?) One reported by a hunter.

Coyote. many signs of tracks and droppings in all situations.

Tamiasciurus. Common. Several one pile in evidence.

Porcupine. Tracks in trails. 2 killed by hunters. no serious destruction to trees.

Gopher. Generally distributed. In many cases there appears to be an increase in activity with some mounds of bushel capacity, other area where the entire mound accumulation is recent indicating that a new complete system of chambers being excavated at one time.

Butterflies rare

Diptera very few mainly an asilid.

Grasshoppers Can be heard on sunny sidehills

Crickets Few of these felows.

Picea engelmanni. dominant conifer especially on north exposure

Picea pungens Present.

Abies concolor dominant conifer where partially open. Many large trees of magnificant proportions. Mainly at heads canyons draining to west to low country. Englemann in canyon or flat plateau country.

Pseudotsuga mucronata. Mainly on south exposures and associated with the white fir.

Pinus flexilis. Mainly south exposures in rocky situations.

Other present but the above the important.

Aspen. nearly all bare with leave colorless but crisp to walk on. Those aspen remaining yellow are extremely few. When among conifers the golden leaves on the dark ground among the dark conifers is a most elequent site:.

Equipment list:

matches
Tea towel 1
Face towel 1
Hand Soap 1
Laundry Soap 1
six salt sacks
Coffee pot.
Sugar 1 pint
Salt. pepper
good pants 1 pair
~~2 pairs of sox 1 change~~
2 pairs silk sox
2 pairs light wool sox
1 pair heavy wool sox
Hunting Coat
Sheep Skin
gloves
Handerchiefs
1 pair good shoes
hunting Caps
rubber boots
Sew kit
First aid
tape
mercurochrome
burn salve - bantage - tuigers - mirror

tent
tent fly.
pins for fly
stove
pipes
canteens
iron tent pegs
Knife - fork - spoon
large spoon (1)
frypan (1)
2 plates
2 cups
1 kettle
1 water bucket
camera
film
Binoculars
Gas lamp
mantles
gas for lamp
flashlights
Guns
ram. rod + oil
1 rags
ammunition
hunt Knives
friction tape.

whet-stone
axe
saw (hand)
pocket hatchet
pack rocks
licences
shovel
Mosquito reelent
wash pan
pliers
file
tin cutters
nails
wire
rope
bolts
straps
for two { 3 sleep bags, 2 quilts, 1 blanket
duck pillows (2)
pencil - notebook
watch (alarm clock)
thermometer.
gunny sacks
Car Chains two rope.

1 loaf bread per day
1/3 lb butter per day

other important food items

Coffee
milk
lard
potatoes
Cheese
lunch meat
apples
fruit
Jams
cookies
Chocolate
bacon.
wood box for packing

401025-186

10/25/40

Bears killed during hunting season.

The following bear were taken during the deer hunting season of this year from the 19th to 30th of Oct in Utah County.

1. Mr Farley - west on 6th So - Provo.
2. Mr Elmer Castleberry - 341 So. 1st E.
3. One of a party of which Paul Larson was present.
4. Denzel Brown - Provo - a 400 lb bear in fifth water area in Diamond Fork, Utah Co., Utah
5. Lew Carter - Provo, Upper Section Hobble Cr. a 600 lb bear seven foot 4" long. Utah Co., Utah.
6. Byron Hatch - Springville. Taken in Diamond Fork - 400 lbs on the 24th
7. Mr. Madsen reports 2 bear in camp at Madsen Camp in Strawberry.

Provo, Utah 10/25/40

Observed the aspen patch above Maple Flat east of Provo to be dead and leaves gone. (see previous observation) Mr. Pope of Provo says that pepper sprinkled inside of deer will keep blowflies from depositing eggs.

Provo. 10/26/40

Snowed on Cascade mt and equivalent altitudes.

10/27/40

Provo

Snowed to "Y" on mt. A decided change from Indian Summer to typical winter. Cascades look as if they had received their full winters allotment of snows.

Dipodomys at Sand Dunes west of Curtis Station - Provo Bench. 10/31/40

Commenced trapping of live Dipodomys last nite to be shipped to Reed Fautin at University of Illinois for experimental purposes. Caught three out of 15 traps. These were placed in cage in car but only 1 remained alive next morning, regardless of a blanket placed over cage and heat generated by body of friend while sleeping in car. The measurements of those declared are:

(1-10-31-40). Dipodomys 245-144-38 ♀ uterus normal

(2-10-31-40) Dipodomys 244-146-39.5 ♀ uterus normal

Found on examination of the bladder of these animals that it was highly distended. This condition is invariably found in those animals that have suffered from cold temperature or exposure during the night and indicates a probably delicate water adjustment of normal animals. One finds that the older animals are more susceptable to exposure than young animals. In sub-zero temperature those animals remaing in traps for six or seven hour during the night are found either dead or in such a shape that their recovery is beyond control regardless of preserving favorable temperatures later one. Trapping procedure was to place trap at entrance of holes that showed fresh debris and otherwise likely looking holes. With small coal shovel excavated a hole 4 inches deep and place trap in bottom of floor so that the animal could not help but visiting trap on way out. In this way one is more likely to catch the cohabitant

of the hole. However find that other → dipodomys visit → the hole and trap from surrounding and adjacent areas. They like a depression or a foot imprint or furrow made by the foot in the sands. In furrows made intentionally in the sand are found tail marks and foot imprints in a greater concentration and directive coarse than the other general sand surface experiences. From inspection made every hour from sundown to 11 o'clock find that they become active about 1 hour after sundown and continue throughout the night but particularly during the first few hours after sundown. Find that the dipodomys return to trap as soon as 7 minutes after replacing ba[illegible] to 1½ hours. In the main the rats remain in the immediate vicinity of their holes and return many times in a short period. One hole had been 1 quart of dirt near entrance and rats had used it consistently as a stomping or resting ground. Nearly all holes which were used had [illegible] new sands kicked out of the holes. no rats caught after 11 o'clock P.M from holes that looked likely. Examined newly exposed indian artefacts on dune, superimposed upon the original dune and then covered subsequently with additional sands. The definite layer some 4/5 way up present sand dune. Debris mainly heat broken pebbles and rock of sandstone, limestone and igneous boulders. numerous charred bones, very few flint chip. nite of clear sky. On arrival watch 2 farmers boys go out near their home and shoot 3 pheasant. I thought at the time that this was their way of controlling pheasant depredation on their property but after them continues and shot 3 flicker and 2 raben was convinced that it was a matter of lack of education program of the sportsmens organzation.

Pleasant Hunt. Geneva. (see page 194 for 11-1-40)

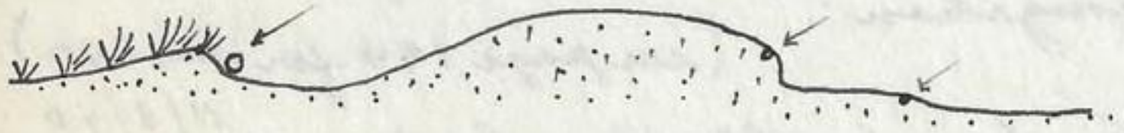
11/3/40

During course of day found hunters ruthlessly shooting into flocks of redwing blackbirds. Others formo shot here. 1 gr. horned owl, short eared owl, 2 magpie, flicker, rabbit as well as the female pheasant. One cannot conceive of the toll of wild life taken besides the pheasant. Found 2 dead male pheasants shot in the last two days before open season. One held a crop of whole corn cornels and was probably shot by some farmer in the act of feeding on the corn. Day cold, rainy & windy. On lake shore found 3 rafts of about 300 pelicans, 12 Canadian Geese, 15 avocets, 12 Wilson Snipe and 30 Spoonbills near shore. many other ducks on lake. Wren preferring Tamarabs for nesting medium in preference to native scirpus, Typha etc, even when a piped gravity was used. Lana pipiens active. One find a transect of Scirpus, Tamarabs and Typha lakeward.

401103-188

The → Tamarisk spring
these definite rows of Tamarisk are very noticeable. from rows of debris washed up by the lake.
Dipodomys. Sand Dunes. Curtis Station. especially abundant in springs. A small white water boatmen meant con-
11/2/40

Continued trapping with 3 mice out of 15 live traps. Active between 6:15 P.M and 7:15 P.M. Reset one trap that had failed to go off and in 8 minutes caught the animal. The mouth of burrow was completely covered with tracks and tail marks as if it had remained near entrance or made frequent visits to and from its burrow. In one case ~~reset~~ rebaited trap 5 times at hour intervals before catching the animal indicating that it remained near hole or at least made frequent trips to it. Reset many traps at holes which I had trapped 3 days ago but without results during that time. These holes still showed evidence of being used since then so set trap again to find that these holes held animals which would indicate that probably same ~~same~~ Dipodomys stay in more than one day at a time, or these holes are reoccupied irregularly. In one case I definiely know of catching three animals from one hole during the course of trapping. From evidence of lack of activity of other animals while rightful owner was in trap would be led to believe that those animals caught on a subsequent time ~~co~~ had appropriated the abondon hole. Several other hole from which animals had been taken on previous nites showed excavation but nat reoccupation of abandoned holes. The sand accumulation from the evening excavation is a dry-fine sand as compared to the damp wet surface sand. The holes of the animals, are in the main, on the irregular contours of the sand especially on points or on the peripheral edge of the dune where the encroaching vegetation has retained a ridge of sand while the main dune had moved on.



Only on a few occasions were holes found on the broad moving expanses of smooth surfaced sands except when associated with weeds or vegetation. Some holes were small in aperture but typical dipodomys in circumference below surface as if used as breathing holes. Found the holes widely separated except in a few cases. One area of 10 x 6 supported 5 holes with each one with fresh digging at entrance to burrow, no doubt connected with one domaine. A gopher had invaded sand dunes some 40' from edge and had preoccupied a Dipodomys hole that had been trapped three days before but animal nat taken. The gopher had dug 1 bushel of sand from this hole and another bushel some 18' away. Excavation material nothing but pure sand. Opened burrow on two occasions on different nights and while it was not replaced with a plug that night up to midnite, was on the following visit was blocked. This is one instance where a

gopher had appropreated the burrow system 401103-189
subsequent enlargement. ↘ of a Dipodomys with
(see page 194 for 11-6-40 entry)

11/6/40

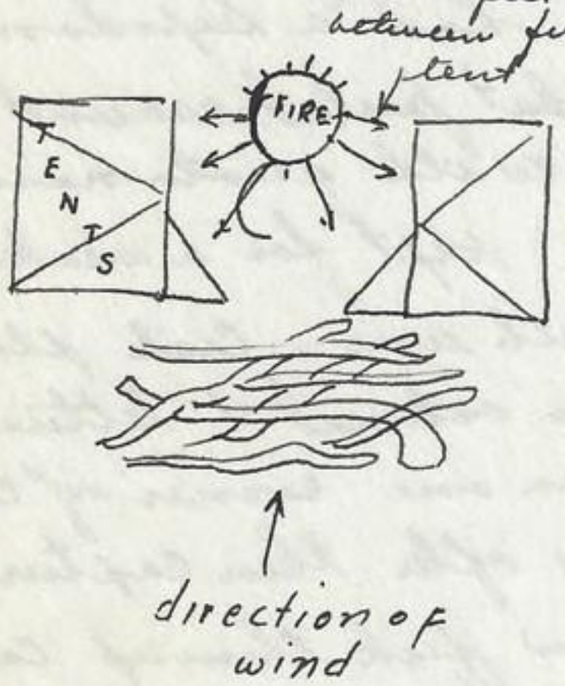
Dipodomys - Sand dunes 1.7 miles west Curtis Station
Continued trapping on dunes catching 3 out of 15 traps. Mainly active between 6:45 P.M & 10:00 P.M. One definitely caught at 7:45 PM found a child of the earth or sand baby digging in hole with sand accumulation as such an etent that would confuse with Dipodomy diggings. Out of a closely grouped set of 4 holes which had been excavated recently only one was used last nite by the Dipodomys one trap had been visited by a cat which had a Dipodomys in and as a result the trap had been somewhat pushed around. Used wheat as bait which was taken ravenously. With quota now in my possession discontinued trapping. Kept for a week in separate chamber of a crate with ends open with wire. Crate placed in completely dark room of a temperature of 68°F. Fed them oatmeal & lettuce. They would take the oatmeal and place it in one corner of chamber. These rats will fed from the hand immediately after their capture without the slightest sign of fear. One can pick them up carefully without their objection, however, if any quick movement is made the slip right out of one's hand. Once they decide to rest or go to sleep, noise or dog scent does not seem to interfer with their slumber. They sleep with head on floor as if standing on their head, but in a curled position. If one is careful in not exposing them to low temperature and offering them a dark room one can keep them indefinely. Shipped eight to Red Fauter at University of Illinois without a death. with these requirements posted on box. — 70°F - dark room - do not disturb.

11/15/40

Top of maple Flat mountain. East of Provo.
Scarib of 51 placed Honor Hike Plaque on Top of Maple Flat mountain on a two day trip. Left base of "Y" trail at sundown which was at 5:05 P.M and arrived at Sheep Flat or Bear Flat at Springs at 8:25 P.M. and by 11:00 P.M had camp set up. Greatest number of bird tracks near base of mountain - Cottontail - quail, pheasant, Junco and Pipilo tracks most common forms found. A few robins calling late. At the eagle pass took a picture (1-11-15-40) of Provo City. Exposure wide open and 10 minute duration. on verichrome. Just deer tracks in snow a few blocks up slide Canyon from eagle pass. The tracks progressively increased with

11-15-40

maximum numbers at Bear flat. Snow from eagle pass on. Found the snow to increased in depth abruptly at head of slide canyon where canyon takes southern trend toward Bear flat. Snow at Bear flat about 11" deep. Temperature here at 11:00 P.M = 26°F with constant wind down canyon to the north. Camped at terminal of medial ridge on flat portion of east shoulder. First collected about 20 small dead aspen trees for fire wood and placed on windward side of camp; then cleared snow from ground and set up tent and built fire between them. The position of fire should not be on the center of the clearing between the two tents but toward the edge where the wind can carry flame and sparks beyond tent and at the same time give off lateral radiation. The fire should be 3 feet in diameter with flame volume about a square yard for best results. A guard must be constantly on the alert for flying sparks which might fall on tent or sleeping bags. With such a close arrangement one must be absolutely sure that the wind is prevailing and will not change in the least degree during the entire course of the nite. Found that the ground supported considerable water with mud developing 2 feet from edge of fire. This muddy condition remains at edge of front of tent and develops under groundcloth, so fir bows are important in keeping ground cloth & bed above the water soaked ground. Outside the immediate confines of fire, the ground remains solid and frozen except during the day time when the area exposed from the removal of snow become generally muddy and soft. Such a camp will be a wet one until the water on soil are removed which involves several hours. Water will continue to issue from bows under sleeping bag inside of tent, so precaution should be taken to place sufficient fir bows under ground cloth. My watch came at 4:30 A.M to daybreak so (11-16-40) had a chance to watch the new day issued in. The full moon make a most eloquent sete of the snow covered mountains, giving to it a brilliance that is most enchanting daybreak came with the bright moon still in the western horizon. Temperature at 4:30 A.M = 31°F. at 6:22 A.M = 33°F Morning star up at 6:22 A.M with daybreak well advanced. At 7:00 A.M the first birds became active including the L T. Chickadee, Utah Jay, R. Mt Pine Grosbeak, robin. Temp 33°F. At 8:00 P.M. Temperature 32°F. The temperature range is a little out of the normal range with irregular fluctuation. After breakfast we



left camp and gained the west ridge leading 401116-191 the Maple Flat mountain where we placed the Copper Plaque in a Douglas (up to top of) fir tree at highest point of mountain. From the top took 2 picture. Picture (1-11-16-40) shows Slate Canyon in immediate foreground with the Roafer Mt and Nibo range in background. The smoke nuisance of Utah Valley is more than evident in the picture, which is the general rule. The southern terminal of the valley receves the sum-total of all smoke of cities to the north. The abrupt dip side of Slate Canyon presents

NO RECORD.

1-11-16-40
of the rock structure on the south itself. Picture no (2-11-16-40) pictures the group of fellows makeng this trip to the top. From right to left are Jan Bell, Lee Carlson seated, Bob Free and Dwight Taylor in foreground, with plaque in his hand. Timpanogos in back-ground. The tree are principally Abies concolor & Pseudosuga with cercocarpos montana on south exp-osures. Aspens leading up east side of peak but replaced by con-ifers on west side. Found a good occurrence of Mt. Ash on east side mixed in among the aspen. The Ceonothus is a con-spicious plant on ridge leading up to peak from the north. On flat east of peak and just below top measured an Abies Pseudosuga which was 15'4" in circumference. On the east side of the Maple Flat peak is found signs of extensive fire and subsequent (?) cutting of timber with stumps remaining. The conifers on west exposure are mixtures of Pseuds & Abies. Snow depth on east side averaging 1 foot 8 inches. No wind on top.

NO RECORD

2-11-16-40
Some of the interesting observations are:
Golden Eagle. One bird soaring near top as we approached. It con-tinued soaring to the east and gaining altitude and then with wings partially closed flew or rather sailed south across Slate Canyon.
Snow-shoe rabbit. The tracks of the snow shoe were the most frequently encountered. While the tracks were generally distributed there were areas where there appeared to be fewer of these tracks in an area which did not appear to be drastically different from the

other areas. 401116-192 most frequently inhabited are areas
↘ The areas →
in the immediate vicinity of conifers. The surface around the
base of these trees are completely trampled. From these conifer
stands the tracks range out into almost every conceivable place
that might be covered with snow. From the frequency of tracks
would say that these rabbits are at a maximum peak. On
two occasions found the remains of these rabbits, having
fallen prey to either hawks or owls. One examined showed
that it had been taken early this morning. One area of 1 square yard
showed many marks on snow where struggle took place. From here
the rabbit was drug 10' to where it was eaten. The stomach, intestines
and a few pieces of fur were the only parts left. The hawk had either
eaten it completely or had carried it off to some perch. Rabbit kills
are generally indicated by the presence of only the alimentary canal and
a few bits of hair.

Deer. The greatest activity of deer as indicated by trails in the snow
is to be found in floor of canyons and particularly at spring where trails
completely crisscrossed the entire field near water. While the water was
available they did not seem to come here to drink. One place they
had dug down to the masses. Examined several horning trees of
recent use. Some were associated with their bedding grounds. Just
over top of high point of Maple Flat Mt found the deer to have been
milling around with frequent resting beds. It would appear that
these deer just dropped down, so to speak, in the snow without any
attempt at making an excavation. Such spots appeared to be used
just a temporary resting grounds during the day. Most of the deer
tracks were traveling with purpose of destination in mind except
on flats and in canyon floor of slide. Tracks in snow mainly deep,
however some on surface only. Would say that main concentration of
deer tracks are now in the Canadian or aspen Zone with snows.
1½ - to 3' deep.

Dusky grouse. No birds and only two sets of tracks
G. R. Grouse 3 birds. One feeding among aspens on east side
of peak on surface of snow. It flew into aspen and remained on
20' approach when it left 100' and flew without abrupt motion but
with a gentle flight. On return down first right hand fork of Rock
Canyon near where it converges with main canyon found tracks of
a group of about 5 G. R Grouse together.
Cedar Waxwing (?) Flock of 42. Most undecided as to their
course of direction. Their wheeling irregular but flight and soaring
effected in a rather smooth & gentle manner.

401116-193

Tamiasciurus h. v. Found tracks → that could be this
form but their frequency and general distributions outside
their normal conifer habit would lead one to believe probably it
would be the weasel. The fawn feet in some position with
jumps of about 1½ feet. If it is the tree squirrel they
have an entirely different distribution than I have been led
to believe.

Peromyscus. Few tracks. Found them, however, in greater
frequency in vicinity of rock slides on lower Rock Canyon.
Hairy Woodpecker, water beetles, Hawk (Swainson?) one hymenopterous
insect also present. at mouth of rock Canyon took
picture (3-11-16-40) shooting down
Canyon with tintic quartzite ex-
posure of north wall. Exposure
of 1/5 sec and wide open at about
4:00 P.M. This section of the
canyon offers an interesting and
rugged exposure and most
impressive when coupled with
deep shadows and high lights.
The rock wren and canyon
wren were found in these
ledges. The overturn structure
is decernable at this point.
While this trip proved enjoy-
able and I personally experienced comfort, [redacted] am im-
pressed with the fact that the closed tent and stove is the
practical tent setup for winter camping. because of the con-
servation of the wood supply if nothing more.

NO RECORD

3-11-16-40.

11-17-40 ← Dates below entered this date

(insert) 11-1-40 (see page 187 for proper date entry)

Drove up to Deer Cr. Dam in Provo Canyon. Water just commencing to back up into valley. No duck along entire course of Provo River. On return trip observed an unusually long sun-set with clouds above remaining intense red. a clear-greenish blue sky separated the clouds from the mountain skyline in the distant west horizon.

(insert) 11-6-40 (see page 189 for proper date entry)

made after dinner trip to Maple Flat and return. Left Bonneville level on regular trail up log trail at 1:45 P.M. Sled not conform to trail proper but made own graded trail on north side hill part of the time. The itinerary and time correlation is: Bonneville level 1:45, first rock cliff gate 2:19 P.M., Last rock gate (natural gate) 2:50 P.M., point where level trail cuts around north end of Maple Flat to Springs 3.23 P.M, continued up log trail to top 3:40 P.M., South across Maple flat to Point or Mother Sunas Nose 4:00 P.M., Left point at 5:00 P.M and descended to bottom of gulch just east of point 5:43 P.M, mouth of Slate Canyon 6:20 P.M, home 7:00 P.M. Birds and animals correlated with time:

1:45 1 magpie, 1 red tail.
1:45 8 Shufeldt Juncos
146 10 Shufeldt Juncos
1:48 12 Shufeldt Juncos
2:12 1 rock Wren
3:23 3 S. Ruffed Grouse
3:24 3 Chickadees
3:45 Leucosticte.
4:00 Goshawk
4:40 Leucosticte.
5:00 Goshawk

Deer tracks numerous. Birds mainly on east side of Sunas nose in maple and oak at head of canyon bordering the Point of Sunas nose. numerous snowshoe rabbit tracks. The greatest aggregation of animal life was found at city garbage dump where the entire depasal area was one clattering of tin cans and crunching paper. Must be thousands of rats.

1-7-41 The following entered this date. (see first page 1941 for proper entry date)

This afternoon made trip from Union Pacific Round House in Provo, south to Hobble Creek River bridge in pastures west of Springville. This railway runs just west of Roundhouse and trends south. Walked along track entire way and return. Country mainly cattle dairy pasture land. with weed and cattail growth along railroad grade. Few ponds and small creek enroute. Many summer ranged cattle are winter fed in these pastures. Birds and animals observed and counted as follows.

401117-195

only two cases

white-crowned Sparrow 2

Song Sparrow 82 (mainly in singles but found in flocks of 3-5-7-8

Mallard 44 (one flock of 40. the rest singles)

Pintail 150 (one flock of 148, two singles)

Gadwall 15

Shoveler 13

Killdeer 7

Crow 42 (in following grouping 8-3-3-10-1-1-1-15)

B. Blackbird 34 (" " " 15-10-1-1-1-1-1-1-1-1-1)

Tule wren (?) 1

Pipit 31

G. W. Teal 300

Marsh Hawk 2

Baldpate 10

Red-wing blackbirds 2500 in one flock

muskrat 1

On the return trip counted specifically the song sparrows only. mainly in cattails along railway grade. They number 102 and were generally distributed wherever favorable habitat was found. This figure compares with 82 on trip over and could be a difference of time of day or more concentrated effort in counting these forms alone. Also observed on returned trip 5 pheasant, 1 flicker and 8 English Sparrow as well as 1000 Crow which were not observed on route over. Crow had moved into area.

12/29/40

Two hours observing in the field.. made trip from Provo Round House to Hobble Creek and return via lower railway tracks. Trip identical as above. Left 12:00 A.M and returned 4: o'clock in afternoon. Kept record on one way only. Weather dull, occasional rain. Observed following.

R. N. Pheasant. Approx. 12, some running across open fields, others along vegetation growth along railway right-of-way.

Crow. Approx 900 in one aggregate. Many others generally distributed from Bullock Fur Farm South to Hobble Cr River bridge. Found mainly in pastures and fields used by winter fed stock and were concerned mainly with dung. Others found around haystacks, corn field, blackbirdlans. but mainly on ground. On foot one could look in any direction and see birds in evidence. They called continually. Observed the above flock of 900 and the manner in which they traveled from one part of the country to the other. They kept moving from area to area but not in mass formation. From the time the first bird leaves an area until the last bird leaves involves in this case

about 20 minutes. During this 20 minutes there is a continual line flight of birds between the two areas involving one, pairs or small groups passing a certain point at all times. This flight line is supported by continual calls from the birds. Have noticed this type of movement common to many forms of wildlife.

Am. Pipit. 2 birds

Mallard Approx 35. In 80% of the case these birds were paired into 1 ♂ and 1 ♀. When feeding in small groups they left in pairs.

G. W. Teal Approx 120 in one group resting and swimming in pond west of Columbia Pipe Plant. They called frequently.

Gadwall Approx 60 - with teal.

Am. Coot 1

Shoveller 7

Marsh Hawks 9

Killdeer 18 arrived in one flock and lit in pasture.

Song Sparrow. Common in weeds and cattails along right of way. Nearly always in evidence and frequently were observed flying from one side of the track to the other.

G. B. Heron. 2 in flight. Held neck straight for 4 minutes as they circled around the marshes. This habit is not characteristic of the Sandhill Cranes alone.

Brewer blackbird. Flocks of 500, smaller groups preceding in front along tracks. One group always found in near vicinity of animal slaughter yard.

English Sparrow. 31 following the last mentioned group of Brewer Blackbirds.

Magpie 1

Meadowlark 2 calling

Rana pipiens 1 large one in creek

Muskrats 3

Shufeldt Junco 1

401229-197

ADDENDA 1940 The following entered on Dec. 29, 1940

Provo, Utah Co., Utah
may 25, 1940

On this date compiled the following research informations on an annulation and aspection study of several communities of animal and plants. The areas are 1. The flood plains of the Provo River, 2. Rock Canyon alluvial fan, 3. climax and subclimax forests at aspen Grove and environs. The dates, starting with march, 30, 1940 and ending May 19, 1940 are; March 30; april 13 and 27; may 4, 11, 17, 18, 19.

The research areas are:

Provo River Flood Plain:

A-3-30-40 shrubs. Dates checked: March 30, April 13 and 27; may 4, 11 and 25.
B-3-30-40 birds
C-3-30-40 ground
D-3-30-40 herbs
E 3-30-40 tree.

alluvial flood plain, mouth Rock Canyon (Provo)

A-5-11-40 ground
B-5-11-40 herbs
C-5-11-40 artemisia, ground
D-5-11-40 " shrubs
E-5-11-40 " herbs
F-5-11-40 grass ground
G-5-11-40 herbs
H-5-11-40 shrubs.

Research areas checked on May 11, 1940.

Climax and subclimax forests, Aspen Grove, Mt. Timpanogos utah

A-5-17-40 climax montane forests, birds. checked May 17, 18, 19
B-5-17-40 climax forest, mammals checked May 18, 19
A-5 18-40 aspen forest, birds. Checked 18.

A-B-C of each research area are 3 separate plots investigat the same research area but by a group of different investigators. including James a Bee, Burton Hunt, Eldon Landall, Harold Hutchinby, Harry Chandler, Lawell Miller, Ted allen, Bill Higgmbotham, George Cannon and Irwin Mc. Arthur. Prof. Lynn Hayward conducted the research.

The sections were carefully examined for all forms of vertebrate and invertebrate forms. The herb study was effected by sweeping 50 strokes on the herbs with an insect net of known diameter. Ground studies of 1/10 sq. meter. Tree study by shaking

a known size tree over a ground tarp to capture falling insects. etc. Bird census on 5 sq. acres. mammals by trapping a measured area. Inspections were about 9:30 AM on each day the areas were checked (average every week for 2 months).

The research areas are defind in the following paragraphs, tables and charts:

Research area no. C-3/30/40 Provo River Flood Plain. Aspection. First 1½ inches of debris down to and some soil. The surface was generally loose debris of leaves, sticks, misc trash under cottonwood, Boxelder and other reparian like trees. Dominant trees are Populus angustifolia, Populus fremontii, Acer interior, Cornus stolinifera, Crataegus rivularens. also typical understory. Temp april 27 = 50°F, may 11 = 70°F, may 4 65°F, may 26 - 62°F. Ground temp 55°F.

Research area no D-3-30-40 Herb study (as above). Standard net, 50 strokes over herbs. Counted + grouped into species. Herbs in open areas between cottonwoods.

Research area no A-3-30-40 Shrub study. Ibid. Because leaves not grown until 5-4-40 did not start until then.

Research area E-3-30-40 Tree study

5-4-40 Group A = 4 cu. meters - Boxelder.
Group B = 2 cu " cottonwood (leaves out)
Group C = 2 cu " " "

5-25-40 Group A = 2½ cu. meters. Populus "
Group B = " " " " "
Group C = 3½ " " Crataegus (in blossom)

5-11-40 Group A = 2 cu meter cottonwood
Group B = 2 " " hawthorne
Group C = 3 " " boxelder
Group A = 5 " " P. angustifolia
Group B = 3 " " " "
Group, C = 2 " " " "

Research area B-3-30-40 Bird census. 5 sq. acres in flood plain. 10 members in field for 18 minutes

Research area A-5-11-40. Ground survey. Disturbed area at mouth Rock Canyon populated by Lycium, Salsola pestifera, Umbella mustard, Sunflower, Senterezia, Quercus gambeli utahensis, Balsamorhiza, artemisia tridentata, Agropyron, tallyhack, clover, mustards. The area represented

(Continues at bottom of tables)

401229-199

Rearch Area B-3-30-40 (Bird census)

(the groups A-B.C are 3 test plots each 1/10 sq. meter.

	3/30/40			4/13/40			4/27/40			5/4/40			5/11/40			5/25/40		
	A	B	C	A	B'	C	A	B	C	A	B	C	A	B	C	A	B	C
Penthestes atricapillus septentrionalis	1	1	3	3	6	7				2	1							1
Phasianus colchicus torquatus	1		5															
Melospiza melodia fallax	5		5		2	2		2	1		1							
Sturnella neglecta	1				2	1												
Oberholseria chloura	1									1								
Passerella iliaca shistica	1			4		1			1	1						1		
Colaptes cafer collaris	1	2	1	3	3			2	1		1						1	
Falco sparverius sparverius	1											1						
Turdus migratorius propinquus	1		1	1	3	9	1	3	1		8					4	6	2
Cyanocitta coltami	1				2													
Lophortyx californica	2				3	10				3	2	1						
Larus californicus					2	2												1
Troglodytes aedon parkmani						1	1	1	13		7	5				1	3	9
Dendroica auduboni									2	5	6	8				12	7	28
Zenaidura macroura marginella							1				1	2				1	4	5
Hylocichla guttata audoboni																2		1
Hedymeles melanocephalos papago																3		1
Vireo gilvus swainsoni																5		3
Selasphorus p. platycercus												1				1	1	4
Flycatcher																1		1
Icteria virens longicauda																2	3	
Setophaga ruticilla																4	4	
Spinus tristis										3								
Iridoprocne bicolor.												1						

401229-200

Ground 1/10 sq meter each group A.B.C.

FLOOD PLAIN STUDY C-3-30-40

3-30-40			4-13-40			4-27-40			5-4-40			5-11-40			5-25-40			
A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
7	4	8	2	18	2	5	22	12	3		6	1		17			10	Orcobectix striges & depressa
2		4																Diptera (small adult)
	3	11			1		6	23	3	8	1		4	24			4	White mite
11	7	28																Collembola (yellow)
3	1	3		1	2		1		1				1	3			2	red mite
1		4																pale red sat
1		4			1													Diptera larva
1	2	3																Elaterid adult
12	2	2	3	4		3		2	4	2		3		2		1	17	Arachnid
		14	3	4	14	2	8		9	21	18	7		2	2	1		Elaterid larva
1	2	5	2	5	6	3	1	4	1	9	7		2	6				Centiped
17	8	1	1		1	18	10		21	4		5						Annelids (white)
		1		1	2	2		1		3								Annelids (red)
		1																Slug
		1																Carabid
		2					1											unknown white larva
		1			2									5				Cut worm (Lepid larva)
10		1	4		40									24				Collembola (white)
		1			2	2			1	2		1	2	1		1		Millipede
2		1	1	1				1		2		1		1			2	Porcellio
		1			1			5										Tenebrionid larva
3	2						4			3	1						5	Midge
1														3				Collembola (brown)
1							1	2			3		2				1	Lepidoptera Larva
	6		3		1													Black ant
	1																	Crab Spider
	1																	Snail Eggs
	1																	Lygaeidae (black)
					1													Moth larva
			1											4				Diptera adult
			17	1	57	36	1	63	32	4	16	50	1	26		10	27	Thysanura
			1				1											Ground beetle
				1											1			Boxelder bug
				3	2			1			2			3	1	1	4	Staphylinidae (adult)
				2				1										nematad
					4	2	2											Diptera pupa
					1													Curculionidae
						10												Gnat
						25	5	24	16	7	10	21	3			13	50	Collembola
						4	2	7	8	3	9	8	3	1	10	8	7	Ants.
								3										Downy scale (Coccidae)
							16							8				Collembola (black)
							2											Collembola (large black)
								13	1									Ball bug
								1										Fungus beetle
																1	1	Leaf hopper
												1						Drosophila
													1		2			Gastropod
																1		Hemiptera
																1		Cercodentia
											1							Phyllocephora
					1								1	1				Diplopidae
						2			1	1								Tubidae
										1								Polydesmidae
			2	5	3					8	7							Geophilidae
					3					1								Scolopendridae
1	2	5				3	1	1				2		6				Chilopoda

Research Area E-3-30-40

401229-201

Tree Study

	3/30/40			4/13/40			4/27/40			5/4/40			5/11/40			5/25/40		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Elateridae	4	1			14	1	2	1	2	3	3		1	4		1	10	9
Arachnid	6	4	11	10	11	12	3	10		9	24	7	13	38	14	11	54	35
Chrysomelidae	1	1					1	1					1	1		2	1	1
Slug																		1
Boxelder Bug	3	6		5	1			1		1								
Coccindellidae	1					1												
Black Gnat	1		1		2													
Cut Worm	1	1																
Crab spider	1																	
Lepidoptera Larva		2										1			9		3	1
Midge		1					1	3										
Plecoptera		1																
Mayfly			1	1								1						
Leaf hopper					3			2				6	1	1	2	2	1	
Hemiptera						1		1										
Aphids				1		25		1					2	9	8	2	2	3
Gall Fly					1		6	3	2									
Remotemid				1													3	
Miridae					5													
Geometrid Larva						4	3	1	1			1			1	1	2	
Cicadellidae					2													
Caterpillars								1										
Sawflys								1										
Misc Diptera							1	2	2			1	3		1			2
Melyridae									2			1						
Ants									1	25	8	18	1	15	3	30	5	33
Hymenoptera							2	2										
Camptheridae							1											
Calliphoridae							1											
red mite							1			1			3	13	1	5	57	41
Chironomidae								6	1									
Chrysopidae												1						
Moth												1						
Tree hopper												2						
Curculionidae													48	2		1		
Col. Lembobia													1	5	1			
Gnats													1	1	1		1	
Staphalinidae													1	1	2			
Cecidomyiidae Larva																		2
Unknown Larva															4			
Materidae																	1	
Coleoptera																		2

the recently exposed sides of an impounding and unusual central dam covered mainly with timothy. 1/10 sq meter quad not examined as usual.

Research Area B-5-11-40. Disturbed area (Herbs) Procedure as usual with timothy used as subject.

Research Area C-5-11-40 Artemisia Area (ground) 1/10 sq meter quadrat in Artemisia area taken among the sage growths

401229-202

RESEARCH AREA A-5-4-40

Shrub Study

	3/30/40			4/18/40			4/27/40			5/4/40			5/11/40			5/25/40		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Curculionidae															14	5		24
Arachnidae										4	2	2	14	1	10	4	3	2
Diptera										3	1		3	4	3	5	2	10
Formicidae										2	3	5	7		6	10	13	7
midges													1		1	1	1	
Tree hoppers																	1	
Boxelder Bug										2							1	
red mite										1			18		8	2		2
Chloropidae																	1	
Anthomyidae																	4	
Sepsidae																	1	
Ichneumonidae													2				1	
Cynipide Gall wasp																	1	
Hymenoptera														13	13			1
Apid														6				5
Myleridae											2							1
Plant Lice (Aphidae)															1			
Chalcidae													1					
Leaf hopper										1	1		5		18			
Cicinellidae													1					
Elateridae										1				1				
Chrysomelidae										1	1	2			1			
Muscidae											1			1				
Gall fly														1				
Gnat										2								
Moths										1								
Bibionidae										1								
Chironomidae											1							
Coccidiidae												2						

The area unquestionable suffers from periodic floods from the active arroyos, rock canyons and does not represent too stable an area. Procedures as usual.

Research Area E-5-11-40. Artemisia Area (shrubs). Same area as above and employing similar procedure for shrub study. Artemisia main subject.

Research Area D-5-11-40. Artemisia Area (Herbs) Ibid but using small herbs for study and sweeping.

Research Area F-5-11-40 Undisturbed Grass Area (ground quadrat) on sidehill near above areas. consisting of the added factor of tall grasses. $\frac{1}{10}$ sq meter.

Research Area G-5-11-40. Undisturbed Grass Area. (Herbs) Usual methods employed.

Research Area H-5-11-40 Undisturbed Grass Area (Shrubs) Ibid. Usual methods employed.

Not enough evidence available to even suggest the

Research Area D-3-30-40

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Herb Study

	3/30/40			4/13/40			4/27/40			5/4/40			5/11/40			5/25/40		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
midge		1	1	4	1	1	2	1		4					1	5	3	
Gall flies					2					12					2			
Arachnid	2	2		15	5	5	1	2		12			5	1	5	11	2	1
Formicidae					1			1		17			4	1	3	13	3	
Leaf hopper				8		2				8			17		1	4	9	6
Hemiptera										3								
Chrysomelidae				5						3								
Diptera				3	3	2	2	2		8					2	10		8
Elateridae										2								
Ichneumonidae										3							1	
Aphid								1		1								
Hymenoptera										2				1	1			1
Threvidae										1								
Lepid Larva										1								
Saw fly				1			3		1									
Miridae		3		5	1	2	1											
Boxelder bug				2	7	1	1	3								2		1
Gall midge								1										
Melyridae					2			1										
Curculionidae													7	2				
Pentatomidae														1				
Tachinidae														1				
Aphid				23		1									1	2		
Muscidae				3											2			
red mite															1			
thrips																25		
nabidae																2		
Aphid Lion																1		
Antheridae																	2	
Coleoptera (small)																	2	
Gnat (black)			1															1
red mite																		1
Crane fly			1															
Membracidae	1																	
Cicindelidae			1															
Anthrophoridae		1																
Mayfly						1												
Coccinellidae					1													
nomatidae						1												
Bee					1													
Cympidae					1													
Spittle bug.					1													

A Gully this date.

original vegetative cover of this area. The general opinion is that at one time the section supported grasses of the Grama type as dominant with Artemisia following at a later date. The evidence is merely presented for any deduction that can be made from it.

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Research Area A-5-11-40. Disturbed ground area.

A-B-C are 3 test plats each 1/10 sq. meters

	A	B	C
Hemiptera	.		4
Mayfly	1		
Staphylinid Larva	1		
Leaf hopper	1		
Hemiptera (Lygedidae)	1	2	
Beetles (chrysomelidae)			4
Grasshoppers			2
Silver Fish			1
Arachnidae			1
Arachnid (Running)			6

Research Area B-5-11-40 Disturbed area (Herbs)

	A	B	C
Leaf hopper	10		
Grasshopper	11	5	15
Pentatomidae	1		
Flea beetle	1		
Spider	2		
Melyridae		1	
Hemiptera		1	

Research Area C-5-11-40 Artemisia area (ground)

	A	B	C
Silver Fish	1		
Diptera Larva	1		
Spider	4	2	
Grasshopper		1	
Ants (Large)		-	2
Ants (small)			80
Apid			4
mites	2	1	

Research Area D-5-11-40 Artemisia area (Herbs)

	A	B	C
Chogs		1	
Midges		4	
Lice		1	
Diptera		3	
Lepidoptera Larva		1	
Muscidae	1		1
Grasshopper (nymphs)	4		2
Curculionidae	16		1
Nabidae	1		
Hemiptera			1
Small diptera			2
Gnats	15		
Lygidae (Small)	1	1	
Spider	2		
Leaf hopper	29		
Melyridae	1		
Ants	9		
Large Lygidae	1		
Mordellidae	1		

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Research Area E-5-11-40 Artemisia area (shrubs)

	A	B	C
Miridae		1	
Bee	1		1
Grasshopper			1
Beetle Larva	1		
Hemiptera			10
red mite	8		2
Diptera	8	2	1
Muscidae	1		
Coccinellidae Larva	2	1	
Coccinellidae adult			2
Ants	15	2	
Lady bug	1		
moth	1		
Lace wing	1		
weevil	2	1	1
Aphid			33
Spider	8	1	2
Lygaeidae.	40		10
Leaf hoppers	153	3	
Aphid		15	
Gall midges		2	
midges			2
Lepidoptera Larva		2	1
picture wing fly		5	
Muscidae		2	
Staphrionid Larva		1	
staphrionid beetle		2	

Research Area F-5-11-40 Undisturbed Grass Area (ground quadrat)

	A	B	C
mites			11
Spider	4		1
Ants	2	9	4
Maggot	1		
Lygaedae		4	
Leaf hopper		6	1
Centipeds		1	2

The following forms listed constitute the stemmed findings of the above research areas of the flood plane and Rock Canyon areas:

Mollusca:
- Oreohelix strigosa depressa
- Agrilimax agrestis.
- Eggs

Diptera:
- Misc adults
- pupa
- Chironomidae
- Gnat
- Ceratopogidae
- Drosophila
- Chloropidae
- Calliphoridae
- Tipulidae
- Bibionidae
- Anthomyiidae
- Tachinidae
- Muscidae
- Sepsidae
- Chrysopodae (ant lion)

Acarina:
- white
- red

Hymenoptera:
- Formicidae
  - pale red
  - black
  - Misc ants:

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Research Area G-5-11-40 Undisturbed Area (Herbs)

	A	B	C
midges			1
Arachnid			1
Hemiptera			2
Diptera			4
Muscidae			1
Lygaeidae	20		
Leaf-hopper	72		4
Gnat	9		
Ants	25	5	
pea weevil	3		
Nabidae	2		
Striped Lygaeidae	2		
thrips	36		
Spiders	6		
Diptera	4		
Grass nymphs	2		
Lacewing	1		
Coccinellid	1		
Lepidopterid Larva	6		2
mites	1		
Lygaeidae (small)	10		
Leaf-hopper		30	
Hymenoptera			19
pea weevil		2	
Staphylinid		1	
Midge		6	5
		1	

Research Area H-5-11-40 Undisturbed Area (Shrubs)

	A	B	C
Grasshopper			3
Coccinellid			1
Coccinellid Larva			2
worm	1		
Ant	5		
Gnat	6		
Bibionid (March fly)	3		
Spider	6		
Leaf hopper	13	3	
Diptera	7		
Cocanellidae	1		
Lepidoptera Larva	2		
Muscidae	1	1	
mite	1		
Aphid	1		
Negro bug nymph	1		
Chrysomelidae	1		
Spider	2	2	6
pea weevil		1	
Hymenoptera		7	
Diptera		1	
Aphid		8	
Neuroptera			2
Midges			3
Lygaeidae Larva			2
Staphylinid			1
Aphid (different from above)			5

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Hymenoptera: (cont)
- Ichneumonidae
- misc. Hymenoptera
- Tenthredinidae
- Cynipidae
- Anthrophoridae
- nanatidae
- Cholidae

Collembola:
- yellow
- white
- brown
- misc
- black
- large black

Coleoptera:
- misc
- Elateridae
- Elaterid larva
- Caralidae
- Unknown
- Tenebrionidae (larva)
- Lygaeidae (black)
- Staphylinidae
- Curculionidae
- nitidulidae
- melyridae
- coccinellidae
- altiidae
- Cantharidae —

Arachnida
- misc arachnids
- chelonethida
  - Pseudoscorpion
- Araneida

Chelopoda
- Geophilidae
- Scolopendridae

Diplopoda
- Julidae
- Polydesmidae

Annelida
- red earthworm
- white earthworm

Lepidoptera:
- cut worms
- larva
- Tineata
  - Geometridae
    - larva

Crustacea:
- Oniscidae
- Paicilio

Entotrophi:
- Campodeoidae

Hemiptera:
- Aleyrodidae
- Misc hemiptera
- Pentatomidae
- Miridae

Nemathelminthes:

Homoptera:
- Coccidae
- membracidae
- Cicadellidae
- Aphididae
- Cercopidae

Corrodentia:

Neuroptera: (chrysopidae)

Thysanura:
- Thripidae.

5/17/40 - 5/20/40

Results of a General Ecological Survey of Climax and Sub-climax forests

Problem no. 1

Ecological Survey of Climax and Sub-climax forests of Mt. Timpanogos. This problem was established for the purpose and consideration of the general problems of mountain ecology and to determine; kinds and per-cent frequency of bird life in the climax and sub-climax associations and zonations; mammalian make-up of climax association and climatic rating of a mountainous situation.

In the main the analysis is qualitative and is more or less concerned with special aspects of an ecological study and therfore not typically representative of an complete analysis. The methods and procedures employed were not of the type that would allow for the complete analysis. The matter of fact is that the procedure is more a matter of gaining an appreciation and an experimentation of methods rather than one with intent of acquiring the intrinsic values or true picture of the problems under consideration. A source of error can be looked for when evaluating the individual records which constitute the composite record. The policy was for 3 organized group of individuals to conduct separate but identical investigations and then to pool their findings. This not only allowed for a greater amount of work to be accomplished but allowed for verification. The individual data indicates signs of a lack of experience in contact with the field, questionable identification and technique. Included in the party headed by Prof. Lynn Hayward were. Burton Hunt, Eldon Randall, Harold Hutching, Harry Chandler, Ted Allen, Bill Higginbotham, George Cannon, Irvin Mc Arthur and Lowell Miller.

List of equipment included: Binoculars, quadrat string 100 traps, oatmeal, note book, termometer.

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General → Considerations of the Mt Timpanogos problem are: The aspen grove area is located on the east side of Mt. Timpanogos at the base of a range of majestic Alpine Peaks. The mountain peaks themselves tower up to 12.008 feet and support permanent snow banks. The precipitous nature of the mountain allows for distinct zonation but because of the instability of the slopes a typical zonation is inhibited in many places. The evidence topographically indicate a relatively young mountain with recent glacial action, erosion etc. Many of the present physical factors as seasonal snowslides, rock slides, exposures, cirques and moisture play an interesting part. The area represents the Canadian zone with the Hudsonian zone tongueing down along favorable exposures and stream channels.

Research Area A-5-17-40

Established research area A-5-17-40 in a climax montane forest at aspen Grove. While the area is typical climax, is rather limited in extent. It represents a north exposure and adjacent to a creek lined with Spruce and Cottonwood. Considerable evidence of human interference in the form of established trails and habitation. Area supports stands of conifers in all ages with evidence of some tree which having reached maturity have fallen over. Others felled by man. Shrub layer poorly developed. Surface of ground supporting an accumulation of conifer needles, dead stems and normal debris accumulation. Soil dry. Examined three conifer. with ages of 100 - 134 - and 102. The Symphoricarpos rotundifolia and Physocarpa were the dominant shrubs among the conifers particularly where the sun rays allowed for free penetration of foliage. In many places the conifers were in such a dense stand that they excluded all types of ground vegetation. The Amelanchier alnifolia presented a most elegant site with their conspicuous white flowers contrasting against the dark green of the conifer background. The following plants were observed on the 5 acre area:

Abies concolor
Pseudosuga mucronata
Physocarpus malvaceus.
Polemonium albiflorum.

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viola montanensis
Clematis columbiana
Thalictrum fendleri
Smilacina amplexicaulis
Smilacina sessilifolia
Galium triflorum
Desporium tachycarpum
Pachistima myrsinites
Frazeria
Geranium fremontii
Rhus parviflorum.

Odostemon repens
Amelanchier alnifolia
Prunus melanocarpus
Acer grandidentatum
Sorbus. scopulorum
Ceanothus
Symphoricarpus rotundifolia
Tetradymia robusta
Senecio serra
Rosa

Record of the Bird Census of this 5 acre quadrat is compiled for the 4 day period. Each group of observers control a definite limit of the 5 acres and results were combined for this record. Time indicated.

Research Area A-5-17-40

	5/17/40 4:50 P.M	5/18/40 6:00 A.M	5/18/40 4:45 P.M.	5/19/40 5:15 A.M.	
Regulus calendula calendula	7	8	2	2	
Selasphorus platycercus platycercus	1 *			2 *	
Spinus pinus pinus	8 *	11 *	4 *	21 *	
Sitta canadensis	3	1	2	1	
Empidonax hammondi (?)	2	5	5	4	
Buteo borealis calurus	1				
Sphyrapicus varius nuchalis		1			
Junco caniceps		1		1	
Turdus migratorius propinquus		2			
Accipiter striatus		1		1	
Dendroica audoboni			2	1	
Cyanocitta cottami		1			
Hylocichla ? audoboni			2	1	
Troglodytes aedon parkmanii			1		
Vireo gilvus swainsoni				1	
Total	22	31	18	35	

* Bird passed over only:

More evident Mammals					
Tamiasciurus hudsonius ventorum	6	3	3	6	
Citellus armatus	3		1		

401229-211 Research Area B-5-17-40

Established research area B-5-17-40 in climax conifer forest within research area A-5-17-40. Vegetation same as outlined in above. Set out quadrat 1/2 sq acres or 150' x 150' or 24.500 sq feet. Arranged traps in 10 rows of 10 traps approx 14 feet apart. Traps in peripheral edge six feet in. Baited with oatmeal. Result of 2 nights and 1 day catch:

Temp 34°F 5-18-40 5:40 A.M.

mammals trapped.	5/18/40 5:40 A.m	5/18/40 4:30 P.m	5/19/40 5:15 A.m	Total	
Peromyscus m. sonoriensis	5	0	4	9	

During the day several traps had been sprung as if by some large mammal such as Ateles etc.

Research Area A-5-18-40

Established research area A-5-18-40 in aspen forest located at Mule Flat some 2 miles north of Aspen Grove. This area is not typically represented and is influenced by proximity of a spring and temporary human habitation. Total area of 4 acres inspected by 10 men. Began census at 11:30 A.m and concluding at 12:20 P.M. Creek temperature 68°F while the water from the springs proper were 48°F. The limits of the area were roughly within the area bordered by the road on the east, the spring on the north, clearing to the west and the lateral spring gulch to the south. This area is typically aspen but being bordered on all sides with so many openings am wondering if the area represents a typical section. Possibly it approaches a forest fringe edge and not the typical aspen grove or forest. As with previous census the party commanded definite area and then compiled the final data as represented on the following census on following page. This area has supported, in my opinion, an unusual aggregation of bird life.

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Research Area A-5-18-40

Troglodytes aedon parkmoni	7
Dendroica auduboni	9
Coloptes cafer collaris	8
Tachycineta thalassina lepida	7
Piranga ludoviciana	2
Dryobates pubescens leucurus	2
Dryobates villosus monticola	6
Sphrapicus varius nuchalis	2
Turdus migratorius propinquus	3
Junco caniceps	4
Spizella passerina arizonae	1
Hedymelas melanocephalus papago	2
Vireo gilvus swainsoni	2
Spinus pinus pinus	9
Tachycinetta bicolor	3
Scalia curvicorides	3
Red-Tail	1
Un Known	5
Total	76

Rather surprised to find that the martin was not represented.
Enroute to the above research area recorded the following birds and mammals from aspen Grove leaving at 8:54 A.M.

The Gillmans Warbler.
Cattelus armatus
Robin
B-H. Grosbeak
Broad-tailed Hummingbird
Red shafted Woodpecker
R.N. Sapsucker
L.T. Towhee
House Wren
Red tail
G. H. Juncos
Hammond flycatcher
Audubon Warbler
Utah Jay
Sharp shinned Hawk
Eutamias M. Canus
Hairy Woodpecker
Tree Swallow
N.S. Green Swallow
Batchelder Woodpecker.

Arrived at Mile Flat at 10:55 A.M. After completing the census of area A-5-18-40 returned via peak to west ridge line at the apex of the flatiron fascital spur. Recorded the following:

Bluebird 2
House Wren 4
Flicker 2
Cattelus 27
Chipping Sp. 7
Hairy Woodpecker 3

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audubon Warbler 5
Deer tracks common
Coyote tracks present
White throated swifts 2
Hermit Thrush 1
Flycatcher 2
nuthatch 2
Eutamias umbrinus 3
Junco G. H 2
Cliff swallow, several

This group represents forms observed from mule Flat to top of peak. From this peak took a 9 picture panoramic of the country under consideration (1-9) 5-18-40. Also no 10-5-18-40 from same point.

Miscellaneous notes for period under consideration which might shed light upon interpreting census evidence. On the evening of the 17th recorded the birds active during the period from 7:25 P.M to 8:00 P.M representing the beginning of twilight and definite change toward nite. Twilight generally commences at about 7:25 P.M

Robin . at 8:00 P.M these birds are calling vigorously
Kinglet
Hummer active during this period
Wren
W. Tanager
Spurred Towhee
Pine Seskin
Poor will - call at 7:45 P.M. for the first time.
G. T. Towhee
B. H. Grosbeak started about 7:50 P.M
Junco
Audubon H. Thrush. Commenced about 7:55 P.M.

These birds may have called beyond 8:00 P.M as I did not remain in vicinity.

One. Gray-Ruff Grouse drummed continuously from 8:55 P.M to 9:05 P.M. Temperature at 9:00 P.M 46°F.

The morning of the 18th found these birds singing for the first time. Robin 4:10 A.M; Wren 4:45 A.M., R. Cr Kinglet 4:50 P.M, hummer active at 5:15 A.M. Temperature 5:30 AM - 33°F

Birds active or singing at 7:20 A.M are:

Cassin Purple Finch - Singing and courting, head cap raised wings vibrating, body held in same plain as limb.
Pine seskin
W Tanager
Audubon Warbler
Mt. Chickadee
Chipping Sparrow
G. H. Juncos
Robin.