JOURNAL 1938

JAMES W. BEE

1/6/38. Dad brought home a Lesser Snow Goose from the Black Sloughs. Davis Co., Utah. This bird had frozen to death and on examination was not found to be very fat. Shot gun lead was found in body. I mounted it and placed in School Collection.

515 Lesser Snow Goose. Black Sloughs
610. m.m. L. 27 1/2 in T. 3 1/4 83 m.m
430. W. 16 7/16 in Toe. 3 76 m.m Davis Co., Utah. Presented
T —— B. by R. C. Bee.
Wing sp. 58" Sex ♀

1/6/38. Four skunk skulls and skeletons were received from Jordan Irr. & Reclamation Co. by Dad.

516. Skunk Davis Co., Utah.
L. 26 1/4"
T. 10 1/8"
F 3 1/16"
Sex ♂

517 Skunk Davis Co., Utah.
L. 23 7/8"
T. 8 1/2"
F. 2 3/4"
Sex. ♂

518 Skunk Davis Co., Utah.
L. 23 3/4
T. 8 7/8
F 2 1/4/16
Sex ♀

519 Skunk Davis Co., Utah.
L. 23 3/8
T. 8 3/4
F. 2 5/8
Sex ♀

503 Skunk ♂ Skull only Ibid
504 Skunk. ♀ "

[For dates 1-2-38 see page 15
1-3-38 " " 16
1-4 and 5-38 see page 17
1-6-38 see page 18 (addition to 1-6-18 on top this page]

Jan 8, 1938 Sand Dunes west of Curtis Sta. Provo Bench.
These dunes comprise a linear area of about 1,600 feet and 200 feet in width. Typical in outline and about the only active dunes in the series of dunes paralleling the bottom of the old Provo Delta. Practically all the other dunes are dormant and permanent. Its movement has impounded small ponds and lowlands to the east between dunes proper and Provo Bench level and excellent snipe swamps to the west. Numerous springs issue from these regions especially to the east. and from these spring there has been sufficient water to have superimposed its course through the dunes in several places. The vegetative ~~cover~~ seems to be unchanged. However cedars no doubt grew here at one time as evidenced by the recently uncovered burnt stumps and limbs. The original growth of cedars that grew in this area have completely passed from the picture. Numerous Indian camp sites are now being uncovered on these dunes. A few arrows points, metates, grinding stones, charred bone's and broken rocks that have been fractured from the heat of the camp fires. These sites are readily detected by the black burnt soil and numerous rock fragments. One can really say that it was no doubt a wonderful hunting paradise.
The original intention for this visit was to check on the activity of the Dipodomys o. utahensis, especially the stage of the reproductive cycle at this time of year.. The numerous tracks and digging indicated that they must be in full Summer activity. These tracks were localized around the burrows of course, but also runways and isolated tracks were found some distant from the holes, especially around clumps of sage brush or bone weed stalks. Several consistently used trails were located being used no doubt night after night. The most interesting observation was the apparent house cleaning operation in which the debris that had accumulated in the burrows was thrown up in a small pile directly outside of hole. The debris consisted of fragments of stems, seeds and vegetative material that was comparable to the seeds & stems

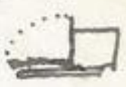
found on the plants growing on or adjacent to dunes.
This recent excavations were more extensive than the ordinary deggings and would measure appro. a quarter square foot in volume covering two feet or more in length from mouth of hole. Thirteen traps were set near entrance but caught one animal. Peanuts were used as bait. Examination of specimen proved it to be a ♀ with normal reproductive organs. The "Hike-Em" specials were just a trifle to large for this type of trapping. The mechanism was a little to coarse for such a small animal but when it did go off. whoa be. that creature that happened to be on the trigger. Personally I think it would have held a cougar. The activity was no-doubt confined to the early evening period at least that night the activity was confined to that period because from 2. o'clock until morning it snowed several inches and no tracks were noticed on snow the following morning. At late twilight something occurred of particular interest. Hundreds of defeks came into the swamps bordering the dunes. Not by tens but hundreds. Sat on dunes 20 feet from where they were lighting and watched their continual arrival and chat. They were still coming in when I left which was about 1/2 hour after dark. A swarm of mosquoes would aptly describe this evening migration. The nights had been extremely cold and most of the ponds and lake were frozen over. It was rather surprising to temperarily reflect back to the time when possibly a prehistoric people sat upon these same sands and was thankful for the abundant food supply offered him. Early next morning they had gone except for seven mallards that had remained secluded in the small streams that intercepted the dunes. These dunes are 1.7 mi west of Curtis Station on Provo Bench. They lay just below the Provo Level of Lake Bonneville (3 block west) and about 300 east of first R.R. tracks. Ut. Co., Utah.

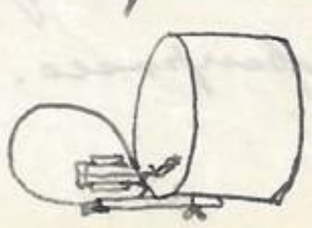
1 1/16/38 Sand Dunes west of Curtis Sta. Set traps on dunes late this evening. There was considerable evidence of activity since the visit on 1/8/38. House cleaning has no dout in the vogue for several ned holes showed the debris accumulat - ion. Permscuous diggings were faund near the centers of activity generally near some burrowing in permanent use. Weather since the last visit had been exceptionally mild and spring like. Took mother on trap line to show her the unusuall duck site seen the frevious visit but was rather disappointed for no ructors arrived that evening. The lake and fonds were open on this night and that along would probably account for the total lack of ducks. in these springy marshes.

Animals collected

520. Dipodomys. O. utahensis. ♀
length 250 m.m. tail 152 m.m. foot 39 m.m.
Preserved fresh tissue of reproductive system; no. skull (taken alive)
SENT TO KEN

521 Dipodomys O. u. ♀
L. 245 m.m. T. 140 m.m F 38 mm.
no skull. Preserved reproductive system. No-post-mortem changes occurred in tissues. Taken alive.
SENT TO KEN

1/17/38. Sand Dunes west of Curtis Station. Provo Beach. Yesterday I felt the need of a series of trap more suited for collecting Dipodomys. For this histological work one must have the live specimen. The specimen is asthenized and the reproductive system taken out and fixed before any post-mortem changes occurr. So a coffee can and mouse trap was concocted to take care of the situation. → 
This apparatus is larger and has the ordinary mouse trap base. This elemnates the causer mechanism of the rat trap style and the larger can opening does not permit the annual to get in the way of the closing lid that trap him when the spring is released.

Set-up → 

The main difficulty with this trap is that occasionally the wheat is eaten just to the tregger

and then he leaves. A mirror in back of the cow may may attracts him into the cow where he will come in contact with the trigger. No ducks came in tonight.

Species collected

522 Dipodomys o. utahensis. This animal died in trap from exposure and possibly this tissue will show post mortem changes. Saved skull Sent to Ken.
L. 240
T. 136 ♂ Preserved reproductive System.
F. 41

523 Dipodomys o. utahensis, Preserved reproductive system but may show p. m. changes. Dead five hours but in low temperatures. Saved skull
L. 255
T. 142 ♂ Sent to Ken.
F 41.5

524 Dipodomys, o. utahensis. Preserved rep. system. Sent to Ken.
L. 254
T. 141 ♂ Dead for six hours. Preserved in
F 42 early morning temperatures. Saved skull.

525 Dipodomys o. utahensis. Preserved rep. system
L. 240 dead six hours before system was
T 136 ♀ taken. Saved skull. to Ken
F 39.5

526 Dipodomys. o. u. Preserved reproductive system from
L. 248 m.m live animal. Saved skull.
T 141 m.m ♀ To Ken.
F 40 m m

527 Dipodomys. o. u. Preserved reproductive system from
L. 245 m.m live animal Saved skull.
T. 147 m.m ♀
F 38 m.m

528 Dipodomys. o. u. Preserved reproductive system from
L 252 m.m live animal. Saved skull.
T. 150 m.m ♂ Sent to Ken.
F 40 m.m

529 Dipodomys. o. u. Preserved reproductive system from
L. 242 m.m live animal. Saved skull.
T. 147 m.m ♀ To Ken
F 38 m.m

530 Dipodomys. o. u. Gave this specimen to D. D. Jorgensen for histalogical purposes. no. skull, measurement or rep. sys.

All the tissue were killed and fixed in saturns and then run up to 70% alc. where they remain permanently. (see 1-18-38 page 24 for insertion of this date.)

1/18/38 Sand Dunes. 1.7 miles west of Curtis Sta. Provo Bench, Utah Co., Utah. Set trap line of 17 live traps. Made set in evening and returned about 10.30 that night. Five were in traps then and several others showed that the Dipodomys had eaten the wheat back to trigger. Next morning 5 more were in traps showing that they accidently spring the trap during the course of their nights movement.

Animals Collected

531 Dipodomys o. utahensis.
L. 228 m.m.
T. 130 m.m. ♀
F 39 m.m.
1 hr. old. Post mortem changes have no doubt occurred. Saved skull. and rep. sys. Sent to Ken Duke.

532 D. o. utahensis
L. 240 m.m.
T. 140 m.m. ♀
F. 40 m.m.
Dead for four hours. Saved skull. and rep. sys. Sent to Dr. Kenneth Duke

533 D. o. utahensis
L. 222 m.m
T 129 m.m. ♀
F. 38.5 m.m.
Fresh tissue from live animal. Saved skull. and rep. sys. Sent to Ken Duke

534 D. o. utahensis
L. 248 m.m.
T. 146 m.m. ♂
F. 40 m.m.
Saved skull only. no tissue taken from this animal. Sent to Ken. Duke

535 D. o. utahensis
L. 252 m.m.
T. 141 m.m. ♀
F. 41 m.m.
Preserved reproductive system from live animal. This ♀ had four embryos. Saved skull. Sent to Ken. Duke

536 D. o. utahensis
L. {injured
T. {tail tip. ♀
F 39 m.m.
Preserved reproductive system. from live animal. Saved skull. Sent to Ken. Duke.

537 D. o. utahensis
L. 243 m.m. ♂
T. 142 m.m.
F. 40.5 m.m.
Preserved reproductive system from live animal. Saved Skull. Sent to Ken. Duke.

380118-7

538 D. O. utahensis, ♂
no measurement!

Fresh tissue. Saved sk.
Reproductive system saved.
Sent to Dr. Ken Lofke. Duke Univ.
This animal was kept in cage in a warm room overnight. Died during the night and on examination of organs found the bladder to be abnormally extended. No tissues save except skull taken.

539 D. O. utahensis
L. 238 m.m.
T. 138 m.m. ♂
F 40 m.m.

540 D. O. utahensis
L. {injured
T. {tail tip ♂
F 40 mm.

This animal met the same disaster as no 539. Skull only. Urinary bladder also extended.

(See later insertion of 1-18-38)

1/22/38. Sand Dunes 1.7 mi west of Curtis Sta. Utah Co., Utah. When I arrived at sand dunes on continuation of trapping found that the Dipodomys were already on their night activity. This was just after the sun had gone down over the distant horizon and the east mountains were still receiving their last bit of sun rays. I set traps and at 6:30 one of the traps went off. at seven oclock another went off. Shortly after seven oclock when complete darkness shadowed the valley I retraced the trap line with flashlight to find that nearly 80% of the traps had been of wheat and a regular trail carried over the fine lid into the burrows. This indicates that they are very active shortly after sun set or even before. Replace wheat again and returned next morning to find six animals had been taken after 6:30 of last evening. From the way the trails are accentuated near mouth of hold would be of the opinion that they make several trips in and out of burrows during the course of the night. Why they do not go into the back of the shallow can where half a hand full of wheat is placed I do not know. They do however during the night finally run into the cereal cache. Probably they have an affinity to the human in that distance lends enchantment and the sooner they leave home surrounding the better.

While waiting to check the beginning of their activity I felt the significance of human interference with geographical distribution. On all sides I heard the continual barking of dogs, a great number of these no doubt go on nightly wanderings as well as the cats that must be represent as commonly as the dogs heard. The wedge of human occupancy with its dogs & cats must certainly act in separating certain species of the same species from one another and a factor in the cessation of intergradation that would normally occurr along this valley of western desert forms with the eastern Wasatch forms. The setting tonight had been visited by a cat that had moved one of the cans several feet from its original setting; while the previous day six of the holes had been dug into by some neighboring dog.

Animals collected.

541 D. O. utahensis.
L. 235 m.m.
T. 130 m.m. ♂
F 39. m.m.
Preserved rep. sys from live specimen. Saved skull. Sent to Ken Duke

542 D. O. utahensis
L. 242 m.m.
T. 142 m.m. ♀
F 40.5 m.m.
Preserved rep. sys. from live specimen. Saved skull. Sent to Ken Duke

543 D. O. utahensis
L. 252 m.m.
T. 141 m.m. ♂
F. 40 m.m.
Preserved rep. sys. from live specimen. Saved skull. Sent to Ken Duke

544 D. O. utahensis.
L. 243 m.m.
T. 142 m.m. ♀
F 39 m.m.
Preserved rep. sys from live specimen. Saved skull. Sent to Ken Duke

545 D. O. utahensis.
L. {injured
T. {tail
F. 38 m m ♂
Preserved rep sys from live specimen. Saved skull. Sent to Ken Duke

546 D. O. utahensis
L. 255 m.m. ♂
T. 150 m.m.
F 40. m m
Preserved rep. sys. from live specimen. Skull saved. Sent to Ken Duke.

380122-9

547 D. O. utahensis.
L. 253 m.m. ♀
T. 150 m.m.
F. 40 m m.

Preserved fresh tissue of rep. sys. Skull saved. Sent to Ken Duke

548 D. O. utahensis.
L. 252 m.m. ♂
T. 142 m.m.
F. 40 m.m.

Preserved rep. sys. Saved skull.
Used wheat for bail in all above cases. Sent to Ken Duke

all specimens up to this date of D. O. utahensis are preserved in 70% alcohol and fixed in Bouins killing and fixing solution (from 1-8-38 to 1-22-38)

1/22/38 Mr. John Hutchings gave me a skull of the Weasel. Taken near his home along the canal bank, Lehi, Utah Co., Utah.

549. weasel. Skull only. no skin measurement.
Lehi City, Utah Co., Utah.

1/23/38 Dad, mother & I visited Mr. & Mrs. Bader of the Jordon Fur and Reclamation Co., commonly known as the new State Duck Club. Met Bill, Betty & Patty children of the Baders. Bill had just returned from his skunk trap line. He had saved two skunks skeletons for measurements and skulls. One interesting comment Mr. Bader made was nearly every den of skunks has characteristic features about that the family individuals, all possess. If he finds a skunk that has narraw stripes the entire family has narraw stripes. The same thing holds true with the other two characteristics found in skunk; large stripes and stripes that do not carry entirely through. These three characteristics hold true in every family and that is his basis for calling them three distinct sub-species or species. The skunk dens are located on the higher mounds along the channel and river edge. He showed us several specimens that varied in tail pattern. Some with white on both top and bottom and others with white on undersurface only.

He claims that skunks do considerably wondering. Several black skunks were introduced in a town in southern Utah to controll the depradations of the mice and gophers. Every farmer was to protect these skunk for several years and when the time came in which there was no more use for the preying animals, they were to be trapped and skins. Would it be possible that the eastern form is still intergrading with own western form. in this particular area.

550 Skunk. ♂
L. 27 1/8 in.
T 12 1/2 in.
F 3 1/16 in.
Skull and ~~skin~~ Skeletal measurements only. Taken on Jordan Fur and Reclamation ~~Project~~ Co. S.L. Co. Utah. By Mr. Bader and presented by Dad. Animal very fat.

551 ♂
L 26 7/8 in
T. 10 1/2 in
F 3 1/8 in
Same as above.

552 ♂
L. 26 1/4 in.
T 10 1/2 in.
F. 3 3/16 in.
Taken on Farmington Bay Project. The dead carcass was found in borrow-pit and thrown upon the bank. It no-doubt came from. Jordan Fur ✓ Rec. Co., South west of F.B. Project. Skull & ~~skin~~ Skeletal measurements only.

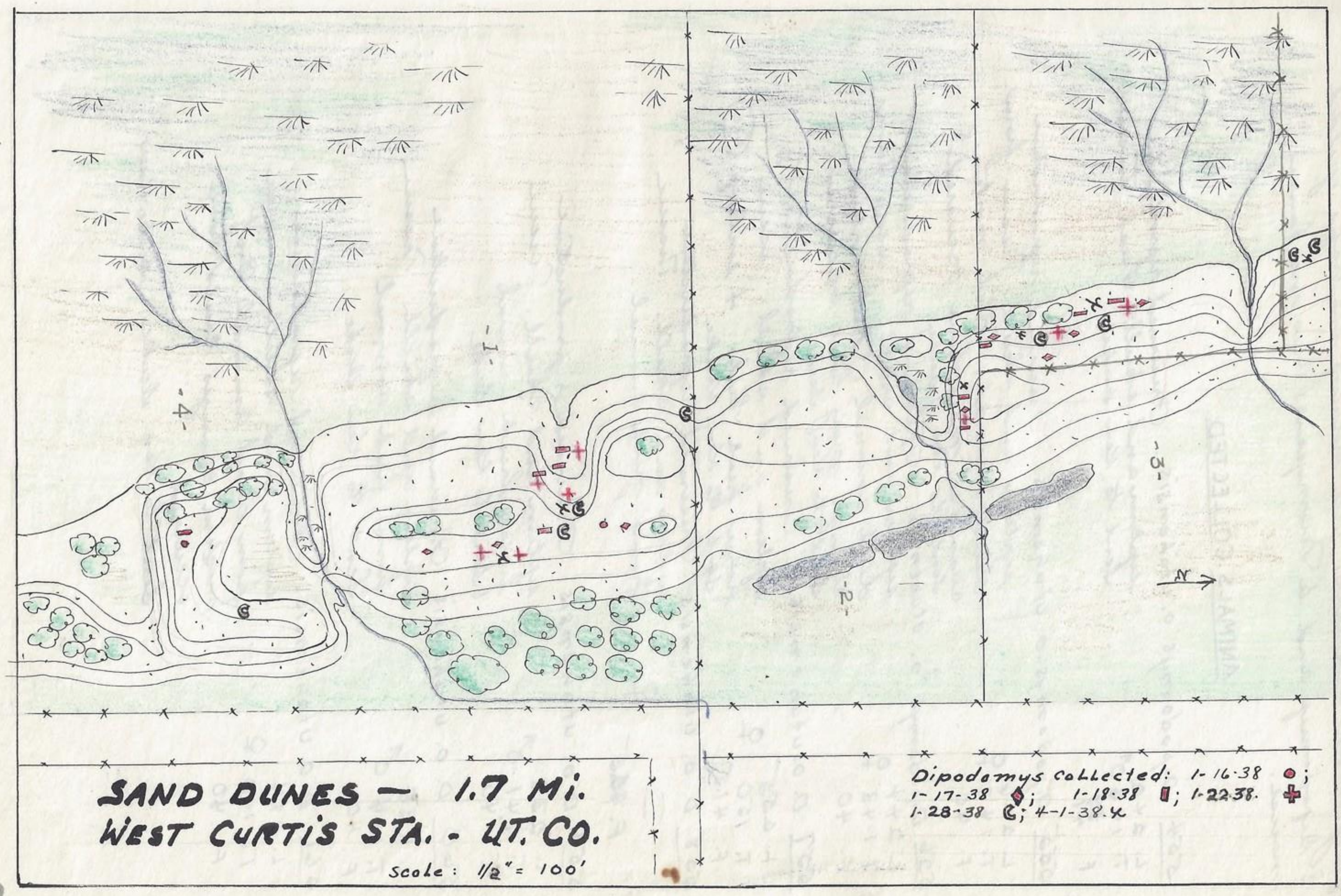
1/22/38 Sand Dunes 1.7 mi west of Curtis Station, Utah Co., Utah.

553. Dipodomys. ordii. utahensis. ♂ Sent to Ken Duke
Sufficient time has elapsed for post-mortem changes to have occurred. Saved skull and reproductive system.

1/23/38 Sand Dunes. 1.7 mi west of Curtis Sta, Utah Co., Utah. Started with traps for dunes but met face to face with a real winter blizzard. attempted to set out all traps but was forced to stop on the tenth one. This wind and snow blizzard was accompanyied with very low temperature. Practically all the old holes were covered with sands and snow and made it rather difficult to find places for setting. I remained in car

until 7:30 and then revesiled the few traps. The circulating snow and sands had interfered with traps but had also shown that the rats had probably never left their burrows. Note or so previous we had a very similar situation in that the temperature was low and winds sufficiently strong enough to move the sands. However the conditions then lacked the accompanying snow. The rats were active then at late twighlight without the moisture while no life occurred to-night with duplicate conditions except the moisture from the snow. Next morning I revisited the dunes to find that not one trap had been effected or burrows disturbed however at three places I run across the tracks of the rat in the snow. They had then came out sometime during the early morning for the track were not obliterated by the wind. These tracks were traced to clumps of sage-brush or protected tumbleweeds so it may be that their burrows were had not been interfered with by the shifting sands, snow and wind.

1/28/38. Sand Dunes 1.7 mi west of Curtis Sta. Utah Co, Utah. Set 15 traps tonight. The winds of the dunes previous blizzard had filled up all irregularities and holes of the abandoned Dipodomys, those Dipodomys captured during recent trapping. So now I had a good picture of the actual members of Dipodomys as evidence by the new holes. Old holes had not been used again, holes where Dipodomys had been taken on previous visits. Did not appreciate the drain I had taken of the rats for now I could see that there were only a limited number, a conservative guess would be about 15 for the area covered by map. The rats are still inhabiting the more or less driftless areas to the north and south of area trapped and may reinhabit the area. However at present the owners of dune section No 2 are tearing down the west side of dune and removing sands into slough by means of water erosion. The rats that are now inhabiting this area may move to the east across the fence. No burrows have been found on this side of fence so can readily tell if any



[INSERT] 38012B-12

migration occurs. Next morning the traps yielded 8 Dipodomys and 6 Peromyscus. Also one house mouse.

ANIMALS COLLECTED.

554 D. ordii utahensis. Preserved reproductive system and skull. Fresh tissue. Sent to Ken Duke
L. 242
T. 146 ♂
F ~~39~~ 41

555 D. ordii utahensis Preserved reproductive system and skull. Tissue from dead animal. Post-mortem changes may have occurred. Sent to Ken Duke
L. 246 ♀
T. 147 +
F. 40

556 Dipodomys ordii utahensis. Preserved reproductive system and skull. Tissue from dead animal. Post mortem changes may have occurred. Sent to Ken Duke
L. 244 ♀
T. 143 +
F. 40

557 D. ordii utahensis. Preserved reproductive system and skull. Tissue from fresh kill. + embryos (SIZE) Sent to Ken. Duke
L. 255 ♀
T. 150
F. 41.5

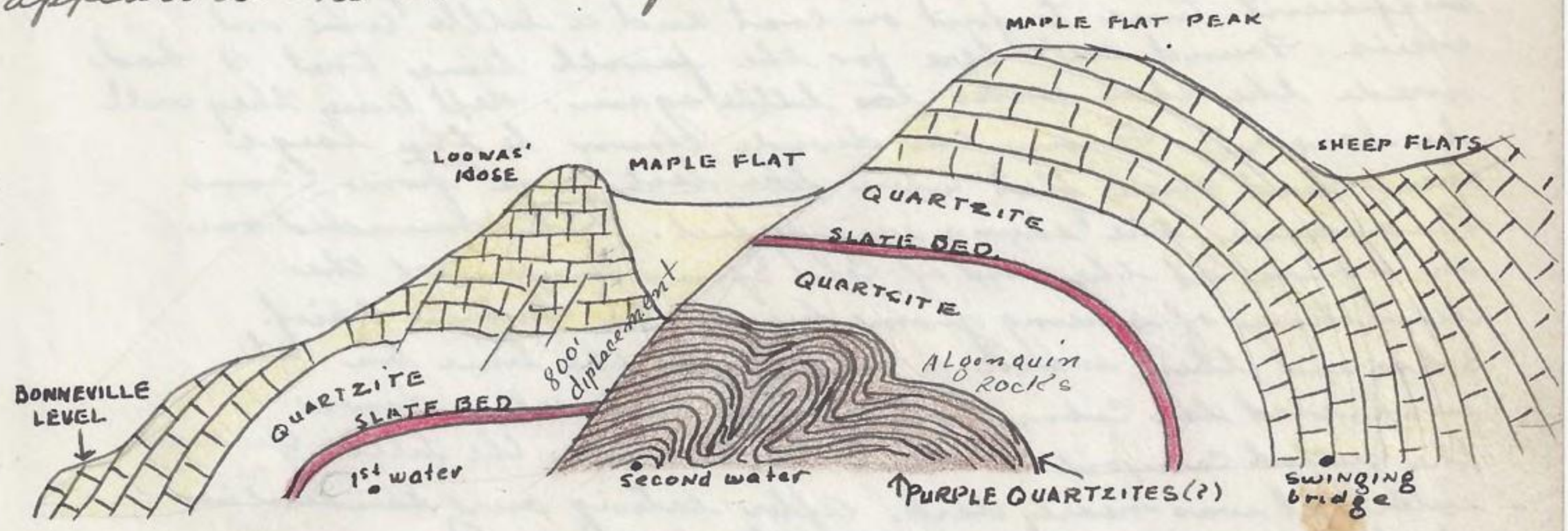
558 D. ordii utahensis. Preserved reproductive system and skull. Tissue from fresh animal.
— ♀
F. ~~40~~.5

559 D. ordii utahensis. Preserved reproductive system and skull. Tissue from fresh animal Sent to Ken Duke
L. 233 ♂
T. 141
F 40

560 D. ordii utahensis Preserved reproductive system and skull. Tissue from fresh animal. Sent to Ken Duke
L. 234 ♂
T. 144
F 40

561 D. ordii utahensis. Preserved reproductive system and skull. Tissue from dead animal. Post mortem changes could have occurred. Sent to Ken Duke. Duke Univ.
L. 244 ♀
T. 140
F. 40

1/29/38. T. Beisford called at home at 8:45 to → arrange for a hike. 380129-14
Decided to leave at 9:30 with the intention of making the round trip up Slate and down Rock. Arrived at mouth of canyon about 9:45 and soon well on way. Had trail already broken to first right hand fork so were able to walk upon the surface. On way observed again the familiar structure at mouth of canyon. Structurally it appears to me to be as follows:



It appears to be a stuffing off on the west of the anticline that dommands the entire front range. The slate beds outcrops at the mouth of the canyon and can be traced to first water. It reappears far above the level of the canyon on the level of maple flat. Again near switch back of trail up canyon it reappears as a vertical bed on the overturned side. The sequence of bed remains the same wherever observed. Had orange and emergency rations at swinging bridge, bar at first left hand fork and then hit the trail with skiis. A ensemble of buckskin beneath ske sock increases the fraction of contact between snow and sock. The trail up slate to the divide of Cold springs seems to me can be made under any kind of snow condition, not as steep as it would appear. However is a treacherous spot to be in if a snow slide should ever start off Grouse Peak ridge. On the side hill where the three mines are located is an unusual heavy & thick growth of mt. Laurel. At this time of year the foliage was free from deep snow and appeared to be quite green in color. At has a north side hill exposure while on the south side of the same canyon there appeared to be a decided lack of this plant. Also at this point the buds of the willow were already in catkins and the aspen had with a recent remnons covered at the points of opening. This area no doubt receives it share of blasting winds but its south exposure and open cliff area to the west no doubt has its warming effect upon the plant life. The Cabin just below the divide of Cold Spring Canyon and our canyon has been remodelled. Upon the old log structure is placed a new roof and a new door & window fitted in the

sides. The snow on the roof had a rather interesting significance. Looked like this.



From here to top of divide is easy grade and relatively short in distance. Strong and cold wind coming directly down ridge of Crows Peak. Our stop on top was short and snappy; just sufficient time to put on coat and a little wax on skiis. Found out here for the fourth time that I had made the skii socks too little again. Next time they well be larger!! From the divide down to the large open mud slide flat where the last gorge North from Crows Peak issue, the skiing was perfect. It reminded me on arrival at the end of Cold Spring Canyon of the definition of skiing given by an old Indian Chief. "S-hss, and then walk a mile." By the time we had inspected the Cabin and forced our selves down the gutted canyon to main trail where the Little Yukon enters it was nearly dark. After eating our sandwiches at the spring we were on the trail again. It was now dark enough to cover all irregularity in the trail and small branches crossing our path. Skied to the first left hand fork and then walked the remaining distance. Arrived at mouth of canyon at 7:00 which made our trip a hour and 9 1/2 minutes hike. Phoned from one of the home along Smart Boulvard and were picked up by dad at 8 north and seventh east.

When making this trip again it would be desirable to allow 10 hours or more on the trail and start at least by 7:45 in the morning. Very few birds were seen and animal tracks fruited However it had snowed that even night and of course had covered up all activity to this date. At the divide we encountered several tracks that could have either been Coyote or deers. Took two pictures. One of maple flat paint with dark cloud as back-ground 1/25 — 1/16 and one of the first left hand fork of rock canyon from Cold Spring canyon. 1/25 — 1/10, 5 oclock with out much light.

opposite page ↗

1/2/38 Sand Dunes 1.7 mi west of Curlew Sta.
Collected Five Dipodomys. Three died during night and the remaining three were kept in captivity. Two died the following night and the remaining one at this date (1/6/38) is still thriving in good condition. Used wheat for food.

Specimens Collected.

562. D. O. utahensis. 565 "
563 "
564 "
566 "
567

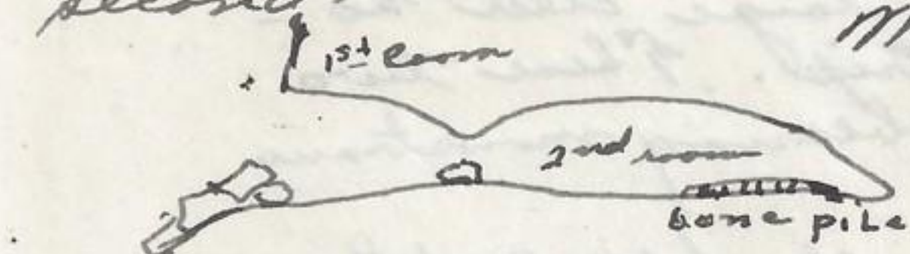
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1-1-29-38

2-1-29-38

(insert)
1/3/38. Dr. George Hansen and five students including myself visited an ancient cave in Am. Fork Canyon. We met National Park Ranger Walker at Timpanogos Cave Station and proceeded up canyon to within two blocks of the convergence of the North and South forks. The cave from this point is located on the north side of the canyon about 150 feet up the steep hillside. Forcing ourselves through two feet of snow we arrived at the opening of the cave. The cave proper is divided into two more or less distinct divisions: an outer chamber of an open nature and an inner chamber which is separated with a constriction ~~through~~ One has to crawl upon hands & knees to enter the second room. The entire length is about 50 feet.



Mr. Walker states that this cave was discovered many years ago by a pioneer and while he (Walker) was tracking bear he ran across this same cave. A bear was holding out here at the time. The bones are apparently confined to back portion of cave and as far down as he has dug he has uncovered a pure mass of bone fragments. On the west side he encountered dung while on the east side the bones. Further excavations may disclose several feet of bone. Some of the bone fragments had been surrounded with a lime-precipitant as found on walls & ceiling in form of stalagmites and stalagtites. This back chamber evidently represents one solid mass of bone. The rat rats had carried

several fragments from cave and placed on their home.
On the ceiling of the outer chamber was several areas of black covering which Mr. Walker claimed was bat excrement. He said that bats were seen flying about the canyon on several occasions during the Fall evening. Bats have been seen hibernating in cave during the winter. He described them as small ones but did not know what species. He also commented on the mt. Sheep. Early residents of Pleasant Grove recall of seeing the sheep on several occasions. A horn of the sheep was also found in Canyon. The bone cave appears to me to have been used by a mt. Lion and the bones represent the fragments of small mt sheep.
One peculiar thing is the relatively sameness in size of the fragments. The lions undoubt broke them into small fragments to gain the marrow.
Dr. Hansen expressed the desire to get assistance from Forest Service and excavate the entire cave starting from the entrance and trench back to the second chamber.

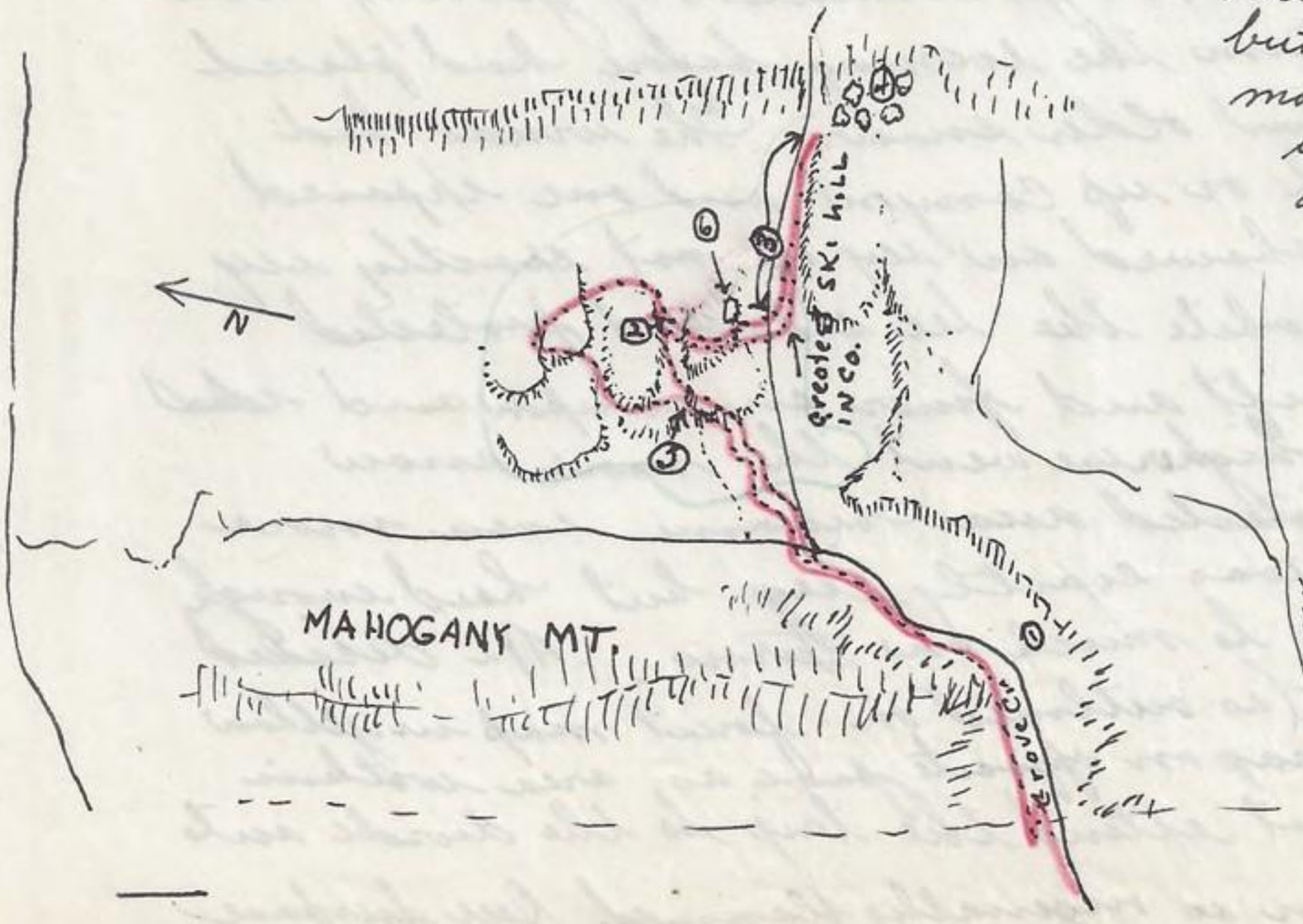
1/4-5/38. (insert) Spent two day in Bear Canyon on Provo Canyon. Included in the trip were Blain Carlson, Buckley Taylor, Bob and Bill Scott, Phil Aiken, Howard ~~Haagen~~ Haagen, Craig Wayman. Harry Thomas. Kay. Hopkins. Set up three tents and tried out. I slept in one during the night and even with an additional ~~five~~ six inches of snow slept soundly. Snow conditions were good especially along the trail where the sun had had a chance to shine upon. Took several pictures on trip 1/25 — 1/8 and one night shot, open and about 30 seconds. Sunny shots normal 1/25 - 1/10. Early the next morning watched a herd of 5 deer working along the side hill opposite the canyon on the deer creek ridge. About 3 o'clock that evening 15 deer were seen in some vicinity. Five bucks were noted in the herd. Two were the large deer two - doubt seen during the autumn trip. These two deer were certainly large for deer, bearing monstrous horns (insert)

1/6/38 About 4:00 Sunday afternoon the folks and I drove up Provo Canyon to look over the new corporations at the Deer Creek Project. Near beaver home at Heldwood saw six ducks that look like the Barrow Golden-eye. The crescent patch in front of the eye was noticeably large and crescent. When frightened they had no trouble getting off the water and when once in air showed a conspicuous wing patch. Farther up Canyon three more were seen. As long as the car remained in motion the birds remained on water but as soon as the car stopped the birds flew up river.

38 01-27-18

The country adjacent to the Deer 380129-18 Creek dam took on an entirely new aspect. On our visit we found the woodland entirely removed from river bottom up to a point opposite the Hoover home. The river was now in full view and took on a decided old age form, meandering throughout its course. The accumulation at the mouth of deer creek, in geological pass, obstructed the river course and impounded a lake. Now the new dam is being placed near the point of obstruction and will impound water upon an old lake bed. Will be interesting to follow through and see just what effect this denudation will have upon the populations of animal and bird life at the peripheral edges, when they return and find an area of desolation. Our return trip failed to find the deer that were noticed the day before.

2/12/38 Today marks the second most enjoyable winter ski trip up to date, at least as far as the actual skiing part of the trip is concerned. I would almost prophesy, today, that as soon as this area is more publicly known will become one of the best of skiing areas in Utah County. Its skiing potentialities was first recognized when trapping extensively in this territory. last year and from years back when short spring and summer trips were made into its slope. Depending upon this earlier notion Tom Gesford and myself shouldered skiis and set forth in anticipation of getting some ideal skiing. Left Provo about 6:50 and arrived at the mouth of Grove Creek east of Pleasant Grove shortly after — Mrs. Gesford was to return at 5:30 at same place and pick us up. The day was starting out to be a nice one. with clear skies but rather cool. Full moon had just set in western horizon about an hour earlier. at mouth of Grove Creek we frightened up several Covey of quail, some hiding under tumbleweed, others at base of old cottonwood in lower branches. The trail was free from snow except in protected area The snows on the north side of Grove had disappeared at its lower levels while on the south side



the country took on a very wintery appearance. Numerous deer tracks were noticed at these lower elevations. The sun on the first switchback was now showing upon the discreed terraces of old lake bonneville that appeared to be far below. No signs of ice or snow in either lake or farm land nestled in the lowlands below. About 1/2 way up the canyon we noticed trails leading into and across the most inaccessable places. no doubt deer trails made early that same morning. The trail up to the cascade canyon was free from snow but beyond the point where the trail is cut out of the solid rocks the was supporting enough snow to make it a little more difficult to navigate than the summer like trail we just left behind. Again a few deer tracks were occasionly seen. The Eagle cliff to the right across the canyon stood majestically against the blue ski as well as the rest of the royal members of this canyon ridge. In less than three hours we were at the point where the trail crosses the canyon and proceeds up the south and east side of the canyon. The cross over was of great concern because one slip might make the day less enjoyable. The temperature was low enough to almost freeze the cascade at this point into a solid mass of ice. Below was an icy slide entirely covered with the stream flowing below it or in narrow channel on top. Without any serious consequences traversed this ice bridge and were on our way through fir and snowy slopes beyond. The snow was solid and hard up to the crossover but now at the first flats it become necessary to put on skies. Took first picture at the point where I had the tents the year before. As we worked our way up series of terminal moraines our trail became throughly pleased with the possibilities of getting ideal skiing. The hail storm the evening before had placed an ideal surface upon older snows. The winds had been from the south or up canyon and one exposed terminal moraines showed an icy or not exactly icy but crusted surface while the lee side and protected areas harbored the drift and finer snows upon and ideal skiing surface. The higher we went the more snow surfaced but in protected areas became even more ideal. No surface was exactly icey but had enough to cause skis to slide to much on turns. We decided to stay at this point (as outlined on forest map in yellow and on reconstructed map on opposite page as area within the green line) and not extend the trip to the divide into American fork Canyon as originally planned. Our purpose

380212-20

1



1-2-12-38

2



2-2-12-38

3



3-2-12-38

4



4-2-12-38

5



5-2-12-38

6



6-2-12-38




2-2-12-38


3-2-12-38

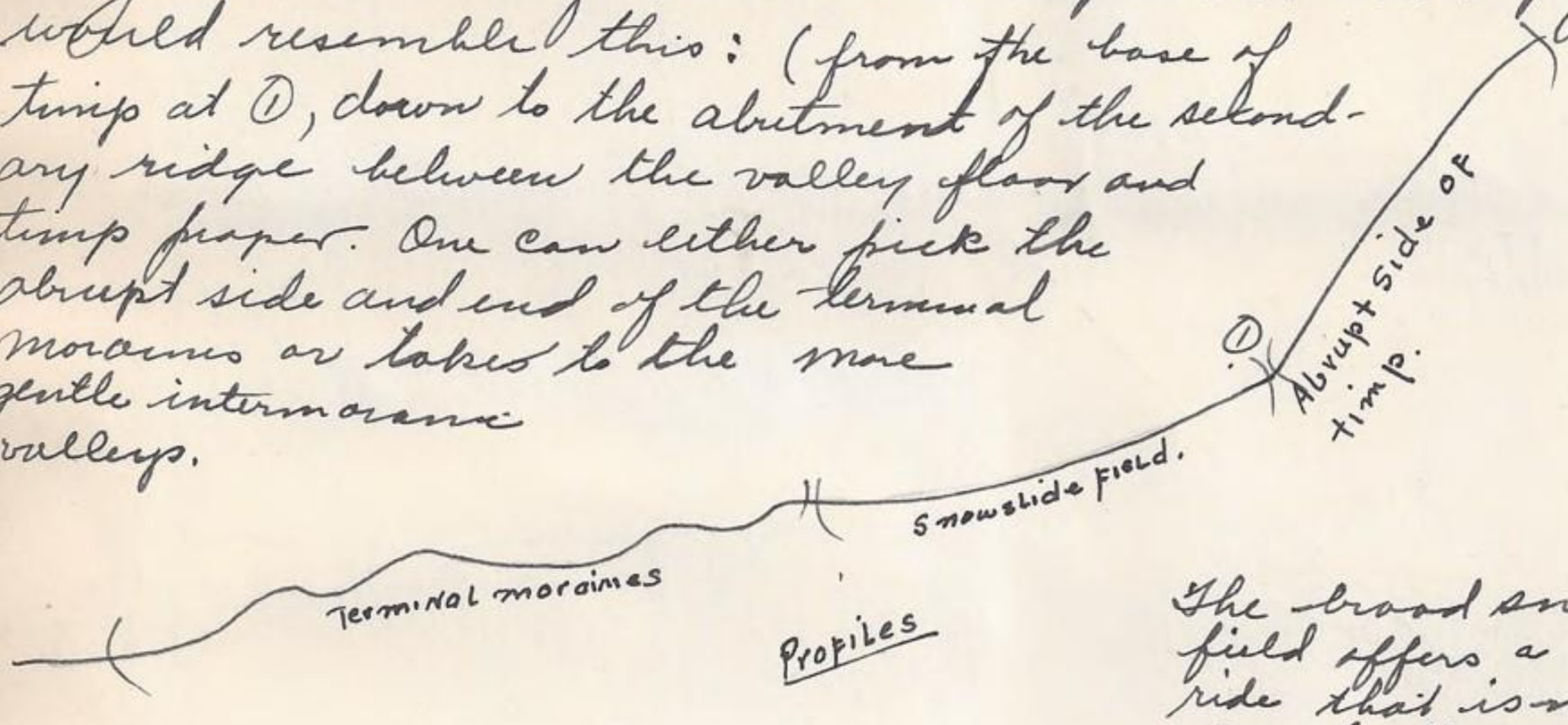

4-2-12-38



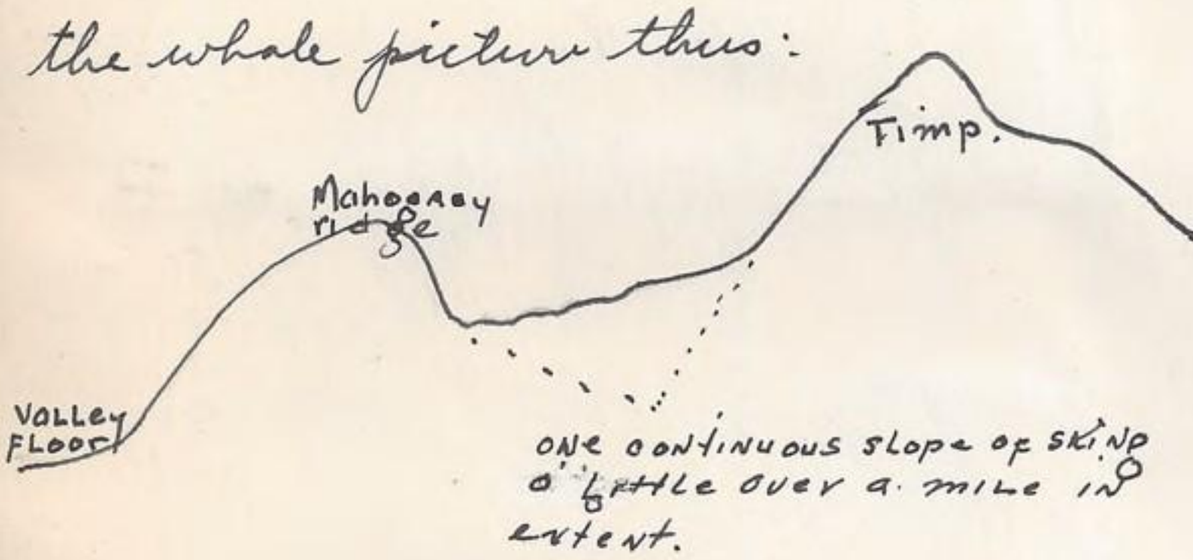
5-2-12-38


6-2-12-38

was not of a reconnoitering nature but to spend the full day skiing and practicing turns on such an ideal surface and upon such ideal skiing hills. Possibley later in the season when this area does not offer such perfect conditions we can make the trip. Have made the trip myself before but can alway get enjoyment a second time. This country is just a series of moraineic deposits. The topography would resemble this: (from the base of timp at ①, down to the abutment of the secondary ridge between the valley floor and timp proper. One can either pick the abrupt side and end of the terminal moraines or takes to the more gentle intermoraine valleys.



the whole picture thus:



The broad snowslide field offers a long ride that is not too steep to shuss or too gentle to slow one down. It is an excellent run for repeated turning.

The area is not the snow slide area itself but borders it to the south and hugs the large transverse ridge running east & west. This run is the best slope that I have ever run except possible the slope on the east side of the strawberry peaks which is much ~~steep~~ steeper and not as long. The wind had blown from the ~~South~~ South and the large ridge had protected the snows just adjacent & north and with the additional accumulation of snow made an ideal surface. Just a surface for turning, a few inches of surface snow upon a harder surface, enough to keep one from sliding or contacting harder subsurface crusts. One would sink in about 7 inches when walking without skies. The expanse was white except for a few isolated tips of aspen and other low growth. This area evidently receives snow slides as indicated by growth of bent aspen to the north. One is realatively safe from slide and yet in a position to see one of the most interesting phenomena in nature, a snow slide. What a thrill it would be to see a slide run by from such a reserve seat as this hanging

slope.

After hurriedly looking over the country decided to leave packs at point ② and practiced run down intermediate valley to point ⑤. This course is very good because of opening at end in which one can stop comfortable. After lunch and preliminary turn practice started for large (area just devasted) and extended run bordering Snowslide area to the south. Took us some time to gain the top but the descent was wonderful. One half mile of turning and schussing on an excellent homogenous surface, no differential of snow surface to throw one forward or backward. One could accomodate high speeds without any danger. Tom had mastered the turns for the first time that morning and now put them into play. a condition experience only once in a while. The winds higher up upon the abrupt mountain side had blasted the cliff with powdered snow and ice with snow banner blowing out into space. The winds were more from the south than the usual direction of N.W. On way up crossed 4 or 5 different sets of Coyote tracks. One track showed two Coyote tracks with a third exceptionally large set running along side. Squirrel and rabbit were also noted. No deer in this country. Area between two points of no. ③ constitute the long ski run at base of north side of E.W. ridge and just south of snow slide area proper. The upper limit of the run starts at the isolated group of fir tree at the very base of the abrupt upward turn of the mt. slope. These fir trees are very noticable from valley floor. Returning to packs again at no. ③ proceeded to make return trip. Left about 2:30 and were able to ski to point where one meets the main graded trail on the other side of grove creek. There was one very noticeable thing observed on the return trip. At a point, where one leaves the more open slopes of this upper valley and merges into the more abrupt slopes of grove canyon, was a line of demarkation between the powdery & Crystaline snow and the wet snow below. From this observation were quite convinced that the playing winds across the flats were more or less responsible for the unmelted snow conditions of the upper levels. The presence of the winds and pressure no doubt is responsible for this difference in snow conditions, because on south slopes of these upper regions the snow still remain unmolested by the suns rays. No slides on face of trip except for one that extended down to snow slide area ~~in canyon~~ about 1½ mi to the north. Possible to cold for any movement. This

area was noticed first on our arrival in the morning. On way down new trail in Grane Canyon noticed that that there had been considerable activity on south side of canyon since we passed here earlier in the morning. The new trails seemed to pass from forested area around edges horizontally to the west exposure of the front range. While waiting on Grayson dam at mouth of Canyon picked out 12 deer on mt slope. so is fossible that the deer could have fossible worked out from canyon to side of front range. These deer were on ski line in Mahogany & cliff. rose directly above the letter 'G' on the side hill. They appeared to be milling & feeding near the ridge. It was about 4:00 in afternoon when observed. After a short while walked down road for about a mile and where we waited until car ~~waited~~ arrived. Keep appointment and on time Mrs Gesford arrived at 5:30 with Pat, Jimmie and new baby. Home at late twighlight and supper. Next day !! no ill effects.

This area, in conclusion, is about the best ~~bat~~ for skiing in the County & surrounding country. It is not very far from Provo and is not necessary to drive ~~travel~~ 2 or 3 hours to gain destination. The trail is generally clear at lower levels and once on upper valley floor are right in the best of skiing territory. Also one can always see just the condition that exist from the valley floor and therefore take no chances in arriving at some destination to find conditions differing from preconceived ideas of what is to be expected. The Grane Creek trail also offers an inspiring view of valley, and cascades, falls etc, below. This is one of the trip that I returned home about as dry as when started. The stuffed prunes of peanut butter, sugar, milk, vanila, and cocoanut proved to work very satisfactory as an emergency food. All told, I think the most interesting thing experienced on the trip was the descent from the same mt side and same exposure of a land of snow and winds to a lower elevation of typical spring weather.

2/12/38. Father procured muskrat for museum mount. Found in Canal adjacent to Farmington Bay. Wild Life Project at 18 mi. north of Salt Lake City. Collected by L. G. Dee.
C.No. 566 - Muskrat. Placed in University Collection

L. 476
T. 232
F 76
Sex ♀

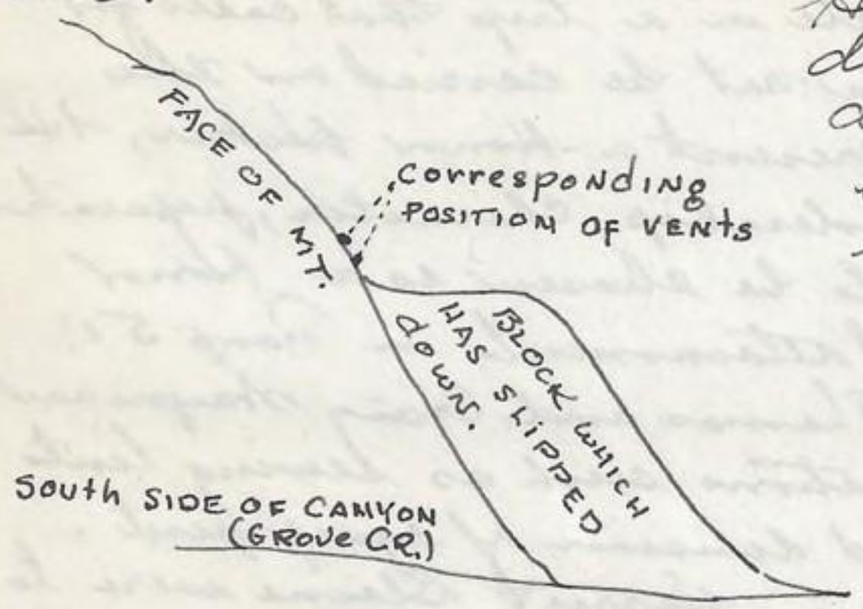
(insertion) entered Feb. 12, 1938. (See page 1)

1/18-19-20/38. A winter ski trip to head of Grove 380212-24 → Canyon cumared our Winter Time Scout Program. The Winter time program was used essentially for the preparation of this three day trip. We term this particular trip the Honor Hike which is ~~occasionally~~ a traditional trip made every year where just a small number of qualifying members are chosen or any number of individuals who have met with the standards set up three years ago; to participate in a trip that calls for a complete independency of anything that can not be carried on the back. Craig Hayman was chosen to represent a Honor Hiker, He qualified in attitude toward scouting, leadership, character, preparation, experience, etc. It is a distinct honor to be chosen as a Honor Hiker and is considered one of the highest attainments in Troop 51.

Wed. evening. Blaine Carlson, Harry Thomas and Craig Hayman met at my home to make final preparations such as sewing tents together and formulating food lists and division of equipment. Disbanded and were to meet Fri. morning. Harry & Blaine were to come up that evening.

Mr. Hayman arranged for transportation both ways. Arriving at mouth of Grove Creek just east of Pleasant Grove proceeded up graded trail. The early start, about 8:10, gave us sufficient time to make observation along trail without being taked for time. Several covey of quail were disturbed from their sleping quarters in the lower branches of the cotton-woods and beneith the masses of tumble weed lying upon the canyon floor. These same birds were seen a week previous in same locality. A little later on we experienced a very unusual thing. At next bend up canyon from second switchback we noticed a clouds of vapor spring from the ground surface. Being on a line between our eyes and sun offered an excellent opportunity to witness the phenomena. The crist cold air of the morning atmosphere also helped to make the clouds more conspicuous. Several steam clouds were observed as we approached the bend. For a minute or two on first observation we was rather startled at the apparent breathing of the rock ridge, but after recognizing their fuction along a fault zone became more adjusted to the unusual breathing occurrance. One close examination found the air to be issuing from moist holes a foot in diameter among the rocks of the ridge. The holes could easily be detected by the presence of moisture and darker color of saturated ground surrounding vent. The ~~air~~ damp air was coming from vent with noticeable velocity and on placing face or hand near opening could detect pressure and cool feeling. The temperature of the air was cool and not warm as would be effected from a fissure along the fault scarp. This damp air kept a dense growth of mosses and vegetation surround immediate area bordering hole. Other holes showed dampened condition but did not support any growth. These breathing holes are located on the north side of canyon about 80 higher than noticeable plateform extending from the face of the mountain. The ridge is along the division of the canyon and front surface of mt.

From this point one can look across the valley toward the south and see the conspicuous fault that has produced these breathing vents. By drawing this slip on the opposite side/ can get a good idea of just what is represented here:



Have followed along these vents dozens of times but were never aware that they ever existed. Will be interesting to follow up and see if it occurs just in the morning in cold temperatures; in winter time only. or whether it is occurring continuously and invisible because of atmospheric conditions. Not being contracting enough make the condensation apparent. Several deer tracks were seen near mouth of canyon and extended up trail for several hundred yard. Beyond this point we lost the tracks except for an occasional crossover. The deer no doubt cross canyon near lower end. At point where trail is cut into sail rock for first time we noticed a herd of about 15 deer across the canyon and several feet above our level. They did not appear to be nervous or show any desire to leave the hill side. They were justified for they were safe where they remained. Numerous tracks were seen in deep snow of opposite site showing that they spend considerable time in the protected and inaccessible areas. Some of the trails lead across rather dangerous slopes near top of ridge. This herd of 15 deer parted with equal numbers going in opposite direction. When we left they were still milling around quite unconcerned about our presence. From the way they acted would say that they were all does. No deer in herd were noticed to have horns. While several more trails were observed higher up canyon no deers were seen on south side. Arriving at point where trail turns north and is bordered by a precipitus slope toward bottom of canyon took two pictures with normal exposure. Craig said that looking up Canyon toward north end of Lumpanogas in background and flat country at base of mt. where we done most of our skiing. The fir trees in distance was close to where we had our permanent camp.



1-1-81-38

The depth of snow on trail was not of any concern to make our trail across but in severe storms and heavy accumulations of snow one would have a rather dangerous trail to traverse. The next picture shows the precipitous walls just to the right of Craig's right foot

via Wayfarer Pictures



380212-26

One slip or fall would probably spell disaster or at least have quite serious consequences. The trail is cut into solid rock formations and the walls are so steep that one would have plenty of time to think things over before the arrived at bottom of canyon far below. Another foot of snow on the trail would have caused us to proceed with caution and possible dig out the trail. About four hundred feet above this point along trail we were forced to put on skis for first time. The walking from here on was quite enjoyable because it made the journey easier in the fact that are arms were relieved from the tension of carrying our skis. We soon reached the crossover where the trail crosses grave creek and works up through firs. Several creeks were crossed without removing skiis but still keeping our contact on the snow. Just a few more minutes on trail from here and we arrived at our destination. The country was covered with a new coat of snow and the camp site was very appealing. Without delay an area was selected between two aspen trees and the snow put into shape to receive the tent; first been level off and then pack to a hard surface with skies. One large ridge pole was tied at one end to one of the trees and the other end threaded into tent, then by nailing the other end to opposite tree were in a position to place the stakes. In short order the tent took on a respectful shape. Now all that was necessary was to set up stove and cover inside with a mat of fir boughs.



2-1-18-38



1-1-19-38

The tept is made up of four 9x9 square tents sewed together to allow for a wedge tent with two forsters tents on each end. When the two final seams are made the tents can be set up as



3-1-18-38

illustraded in picture. The stove pipe comes through one of the foresters tents at one of the ends through a metal tent protector. This combination allows plenty of room for 5 or six members having enough height to stand up and stretch ones arms as high as possible. The stove is composed of two 2 gallon cans.







connected together. The hole on top allows a log 3 inches in width and two feet long to be placed in stove. Circulation is gained through a large draft in front and three small holes on either side. Three sections of 3 inch pipe is sufficient for draft, taking the flame up to height of tent. The stove is set upon 4 upright stakes placed in snow. The stove is toenail with two inch nail at each end of stove. The stove is now a foot above the floor and just at right height for cooking and heating reflection upon the body. Also the height allows ~~for~~ a drying place for shoes and gloves The heat at this height is not sufficient to cause snow to melt under the protective covering of bows beneigth stove. After sufficient wood had been cut and everything in order we still had sufficient time to spent several hours on the ski hills. Spent the remaining afternoon on the hills east of camp and then returned to camp for supper. The snow was new snow but very wet, clinging to skis atrociously and slowing down the skiing praces. A breakable crust beneith added to the undesirable condition of the surface. The sun was shining full strength and was placing havoc with the new snows. Beneith the new snow one could detect the gullied surface of several day ago when small riverlets ran across a hard crust. Most of the older surface was covered by now but still gave away to weigh of skiis upon newer snows above. When skiing on this wet surface it made it rather difficult to turn and stay erect. Ski tracks were formed immediately after ski had glided over. Skiing look like it may not be very good but the tables turned the next day. From Sunday evening until Sunday afternoon we had snow flurries, fog and no sun shine. Shortly after supper the other members arrived and joined us. They made the trip after dark and arrived shortly after dark. being a little over two hours on trail. Kept watch and fire all night and being comfortable to the fullest ytent. Next day we spent the entire time on the slopes. Starting immediately after breakfast for the run described by notes of last Sunday. This ride was well accepted by all of the fellows, acclaiming it one of the best rides they had ever experienced. The upper snow was fine but the sun crust beneath still hindered us in getting the best of pleasure from the descent. After spending ~~the~~ most of the afternoon on the slopes we returned to camp for supper After supper we found we still had another hours to utilize before bed. so worked on slope 300 feet above camp.



photo 2-1-17-31


Craig

4-1-18-38 Tue

3802212-27.1





380212-28

This ski course offered us some of the best practicing of turns ever gained before. The course was fashioned into a slalom run with four main turns. Being banked were needed the run offered skiing at quite a high speed. Tempis and Christis were used and developed. Craig learned the plow turn for first time and Blaine the Tempo r Christiania for his first time. Harry developed his turns to the extent that his chances in the slalom race next saturday may be fully appreciated. Being so near to camp we stayed until dark overcame us. and again the first thing in the morning were on the course again. These pictures while taken without sunshine and in a fog, at least preserves a record of the first lessons in turning. Craig developed confidences and shows his mastery of the plow or variety of stem turns. He is now able to make the turns ~~without~~ with form and end up run without a fall. This new technique will allow him to gain more fun and pleasure on the more open slopes.



Craig 3-1-19-38

Harry. shows his mastery of the high speed turns with his. Christianas & stem turns. all picture taken on 1/300 sec and wide open. No sunshine and dull day.



Harry. 4-1-19-38



Harry. 6-1-19-38



BLAIN 5-1-19-38



BLAIN 7-1-19-38

Blaine handles the tempo as of a master but actually has just been taught the turns only an hour before.











One of the more unusual sites was the migration of fog clouds. forcing their way up Grove Creek Canyon from the valley far below. First a large tongue would extend up over rim and then followed by massive mists to bring an accompanying body of light snows. First the more distant trees would disappear, then in progressive order until even the more adjacent firs would take on an obscure appearance. At this time, especially during the evening hours the atmosphere and condition have a decided oppressing touch. The occurrance of this mist cloud up canyon were frequent and always upcanyon in movement. each clouds brung an accompanying light snow. Especially at night (when the tent was lighted within did the atmosphere take on such a gastly appearance. The tent at this time ~~would stand up~~ would be faintly outlined in a mist of balls. Another interesting observation was the occurrance of snow slides upon the face of time. When we arrived the first day their were no slide on the face but by night the slides were well represented on nearly every steep exposure. Never actually saw them in motion but would glance upon a side hill where the surface was unmolested only a minute before but now supported a nice slide. No audible ~~sou~~ noise was discernable from our location at bottom mountain side draper. Slides were still coming down even after the sun was nearing the distant horizon to the west. These slides were surface in nature and did not gain sufficient momentum to follow down the numerous gullies & canyons leading from the west exposure. In most of the cases the slide originated from the base of a cliff. During the course of the day bare patches presented themselves on the main up-shrouded in fog and mist but at no time were we able to again see the west expose of Timp. After tiring ourselves of skiing we packed up Sunday about 1:0'clock and start our ascent shortly after about 2:50 arriving at mouth of Grove about 4:30. Along the trail we observed one buck and one doe on right side of Canyon. These two deer were more concerned about our presence and were not satisfied until they had gain considerable altitude above canyon trail. At one point along the trail I followed the trail of a Peromyscus for about 3 hundred feet, no tracks returned along same course so possible did not return to point of departure. Before leaving camp snapped a picture of camp and tent. showing, ~~a portion of~~ inside of tent with one side removed. This exposes the inhabitants participating in the final course of dinner, ice cream. Among the birds seen were the. Long Crested Jay, Long Tailed Chickadee, Robin, Flicker, Junco, Mt. C. Grosbeak. The Jay seemed to have a more varied number of imitations at this area.



2-1-20-38

The breaking of camp and on the trail of our ascent appearing in good nature and satisfied with the results of the trip. These fellows gained considerable pleasure from the trip I'm sure, not only in shear joy from the pleasures of skiing and camping but a better and more intimate appreciations of the more finer things that nature offers. They all acclaimed the skiing was the best they had experience and were more comfortable on this trip than they had ever been on previous trip. Just a sign of progress in our development of camping technique.



'ICE CREAM'
1-1-20-38

(See earlier insertion date 2/1-2/38)

2/26/38. A typical springlike day: Coming to school this morning heard the song of the Robin and the mating call of the Red ~~Shafted~~ Flicker. ~~It great~~ Nearly all the snows are off the ground in the valley except in more or less protected areas.

2/26/38 ~~2/27/38~~ To-day dad procurred two specimens of Spilogale gracilis saturalis from the Jordan Fur and Reclamation just South west of the Farmington Wild Life Refuge. Mr. Bader procurred them on his project. Furs were low and the fur was reaching beyond their prime fur condition, so the specs amounting to two fine animals. This fur farm is located 18 mi. north of Salt Lake City in Davis County, Utah.

567. Spilogale gracilis saturalis. Davis County, Utah Jordan Fur and Reclamation Co., Collected by Mr. Bader the caretaker and presented by R. G. Bee to Brigham Young University.

L. 25 3/4" — 654 m.m
T. 9 1/4" — 234 m.m
F. 3" — 76 m.m
Sex. ♂
SKULL OK (IN COLLECTION.)

The annual was in good condition and ~~which~~ appeared to be accidentally fat. The back leg was gone when found and probably had lost it in a trap. Skinned, fleshed, washed in gasoline, then in hot water and good soap. The odor is still detectable but not of sufficient magnitude to be of any consequence. Spent all morning and greater part of afternoon in its preparation. The skin when on flesking board showed numerous scars that were probably recieved, however, before he was caught in trap. no doubt the male are continuously fighting one another.

568. Spilogale gracilis ~~saturalis~~ saturatus. (Ibid)

L. 24 7/8" — 630 m.m.
T. 9" — 228. m.m
F. 2 7/8" — 73 m.m
Sex. ♂

SKULL OK. (IN COLLECTION.)





380227-31

2/27/38 Toward evening mother & I went out for ride. Took skies along and found only skiable patch of snow across canyon north of Bear Canyon in Provo Canyon. The snow was all gone except for a few snow drifts on lee side of ridges 100 feet north of highway. Very little snow remained on ski hill at Provo Park except on field below. Skiing in Provo Canyon proper was null except for this one snow accumulation that only offered about a 100 by 50 foot area. The snow there was extremely coarse and slightly wet. Heard the Meadowlarks in town today. Did not see birds.
2/27/38.

569 Bubo V. pal. mauchi mouth of Rock Canyon, Utah Co. Utah. Collected by Vasco M. Tanner. The bird he was heavily infested with a species of mallophaga, especially in area below bill and around neck. Several species collected and placed in vile of 35% ale. Evidently Mr. Skunk met up with the owl for the odor upon the feet of the owl bore evidence of a contact. The head & mouth did not have this skunky perfume. Nearly all the veins in abdomen region were distended. The skull supported considerable blood between the outer & inner layers as if received from injury. Mounted and placed in best aireated room in building. Time will tell, for it must be presentable to be placed in permanent collection. The claws were ridgedly fixed in a clutched position and was quite difficult to straighten out for measurements.

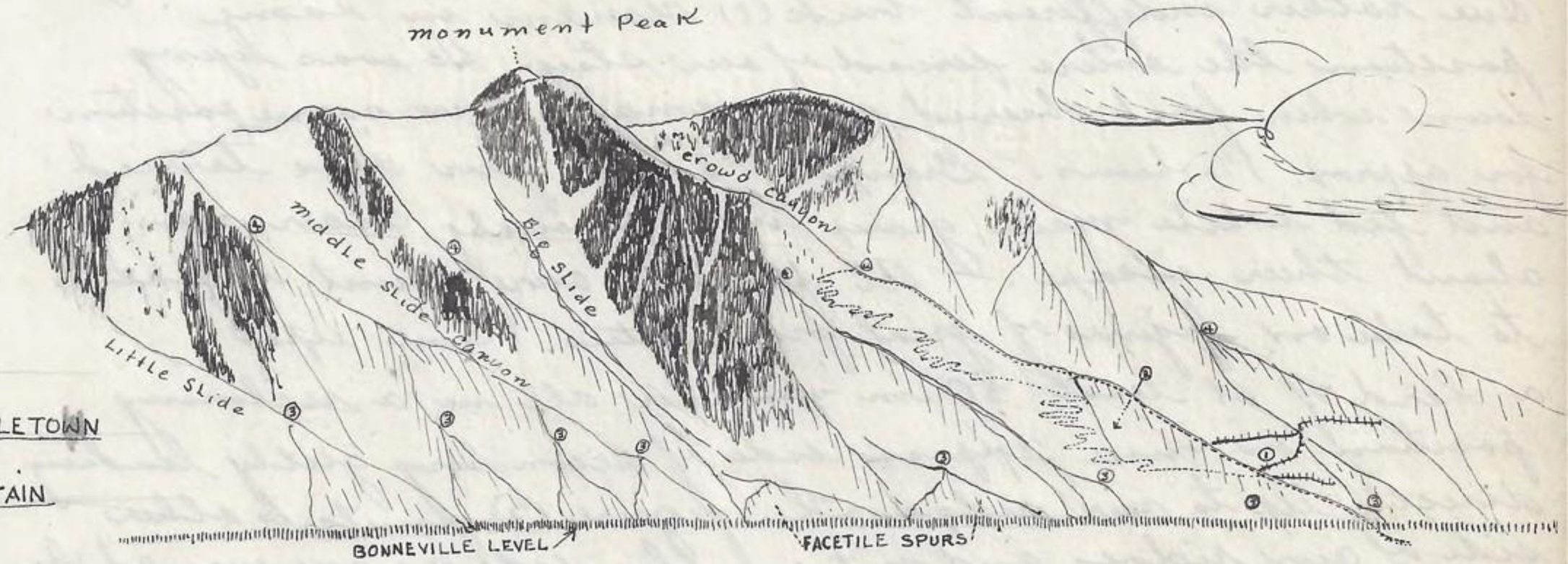
L. 490 T. Sc.t. clear.
T. T. 50 cardinal
W. 355 B.
W.Sp. 1,250 forced sp. Wt. g ——

2/28/38. While on trail home from school heard the beautiful evening song of the Am. Robin. It was perched on uppermost limb of a cotton-wood tree along side of Campus canal. The moment this observation was being made the puddles of water were being riffled by the gentle rain. The mt tops were hid by cold looking mist clouds and an extremely low line of clouds hung at mountain base. Two or more day ago, the 26th to be exact I heard a vigorous call as if the Robin was being molested. This call came from same vicinity as mating call heard to-nite at. 5:30.

3/3/38 Today we had extremely stormy weather. This condition is comparable with the disastrous floods of California and coast area. 2 inch precipitation reported from Brighton which is of a cloud burst propensity. Practically all precipitation fell in the form of snow.

3/6/38 made survey up mapleton mountain today. This mountain is situated between Mapleton Canyon and Spanish Fork Canyon. Utah County. Being a valley bordering range is very suitable for winter range of hundreds of deer as well as many pheasant, quail and other native birds. The lower bonneville level terrace and adjacent oak and sagebrush hill make ideally.

winter range. Ray Snow, Harry Thomas, Blain Carlson and myself made the trip. The first objective being to study the wild life and make deer count, however skiing no doubt held a reserve seat along side of main cause. Left Provo in car and arrived at mouth of Spanish Fork Canyon. Turning north along Canal road progressed for about a mile where we found it necessary to abandon car and proceed on foot. With skiis and lunch we soon traversed the law lying hills and soon



arrived upon the more prominent Bonneville Terrace at the mouth of our canyon we were to investigate. Instead of confining ourselves to the canyon bottom proper we chose the contingent ridge limiting it to the north. This ridge offered better possibilities of reviewing more country than possibly any other ridge upon valley side. Leading upward with a moderate gradient it eventually terminated at the highest point on the mountain range. It also allowed better inspection either to the country to the right or left. This ridge no doubt is the best route to highest peak in any season of the year. From the beginning of our trip we saw considerable signs of deer, even on lowlands observed the feeding grounds. Several areas had been uncovered and feed spaded. One particular plant seemed to be preferred as food being clipped rather closely to the ground surface. It looked very similar to the dandelion and was associated with it, taking on a matted appearance covering many sq. feet in extent. The leaves were more completely pinnated and bore redish stems. The lower areas also showed considerable actively as evidenced by the numerous deer tracks. While gaining our ~~initial~~ altitude we saw our first deer, seven in number and bat on the trail. Crossing the same ridge we were climbing they fell to the bottom of the canyon to our

right and soon joined another head of 38 that had just then come under our observation. This second herd soon divided and were well scattered out in smaller trails of 8-15. Being on other side of canyon did not show extreme nervousness but several went directly up and over ridge, others went up canyon, while others stayed in oak brush and continued their feeding One rather indifferent buck (?) remain in same position the entire period of our stay. He was lying down when first observed and remained in same position for approx. 1½ hours. Groups of 3 and four also tarried and fed while main group was seriously concerned about their escape. At point ② our count began to take on figures of great propensities. Come upon a herd of at least 80 in number all in a reclining position on more oppose side of secondary gully leading directly up to our ridge. The figure ② points to other side of our ridge and not on this side as one would be lead to believe. These deer reminded me, from a numerical contrast only, of a flock of sheep bedding down for the night, however they had availed themselves to more area of the hillside and did not take on that massive or congested appearance. One area of about 12 yards by 20 yards supported approx. 30 deer. One very interest fact was that nearly all these deer were on same gully side extending from the ~~main~~ canyon floor proper to the top of the ridge we were on. Why didn't they use several gullys rather than the one. When approached for the first time a few were resting with head and neck upon snows, while others retained their heads upright. The wind was in our favor but even then they did not detect our presence. Desiring a picture I proceeded to walk directly toward them and when they got up was to snap them running up gully side. Stalked about 200 feet and still they remained undisturbed but when about 200 feet from them they resented my presence and fled up — canyon. Then the site of my life was revealed. Not only a few but the entire hill side moved, some in quite a hurry while others, again, remaining to inspect the intruder, curious no doubt. Leaving the other fellow to count them when jump I stayed closely to my job of photographing. I'm satisfied that the count of 80 is very conservative in numbers. After all the deer

had left this gully we proceeded up ridge and intercepted the next gully upcanyon. Again we found deer resting on side hill. This country offered good bedding possibilities and did not disclose anything like the number just seen. Feel that these deer lying down were same deer frightened over ridge so did not include in official count. Five deer out of this 130 retained horns while many hornless deers appeared to be ♂. The number of deer in all observations was approx. 130 which is I feel very conservative. There is positively no duplications made in numbers fortunately for the type of topography encountered that allowed all deer to be practically seen at one time. These observations were made between the hours of 12 o'clock when starting up ridge, and 3:30 when gaining our highest elevation. The weather was irregular being windless one minute then turning into wind that forced us to put on wool parkas and gloves. At no time was the weather warm. From our point we could see the movements of the storms clouds that shrouded the west mountains, lake mountains and Loafer mts and portions of the valley below. We escaped these threating storms. Interesting to note how the clouds would form when crossing lake mountain. These clouds with low clouds from cedar valley moved south and a little east. The isolated valley clouds cruising along over S. Fork. Sp. ville etc moved in opposite direction, toward the north. The sun filtered down upon the land just west of storm clouds that dropped their precipitation along the State highway route. Will reserve this area for deer pictures but do not have much faith in their turnout. Taken on 1/25 sec and wide open. Snowing slightly at the time.

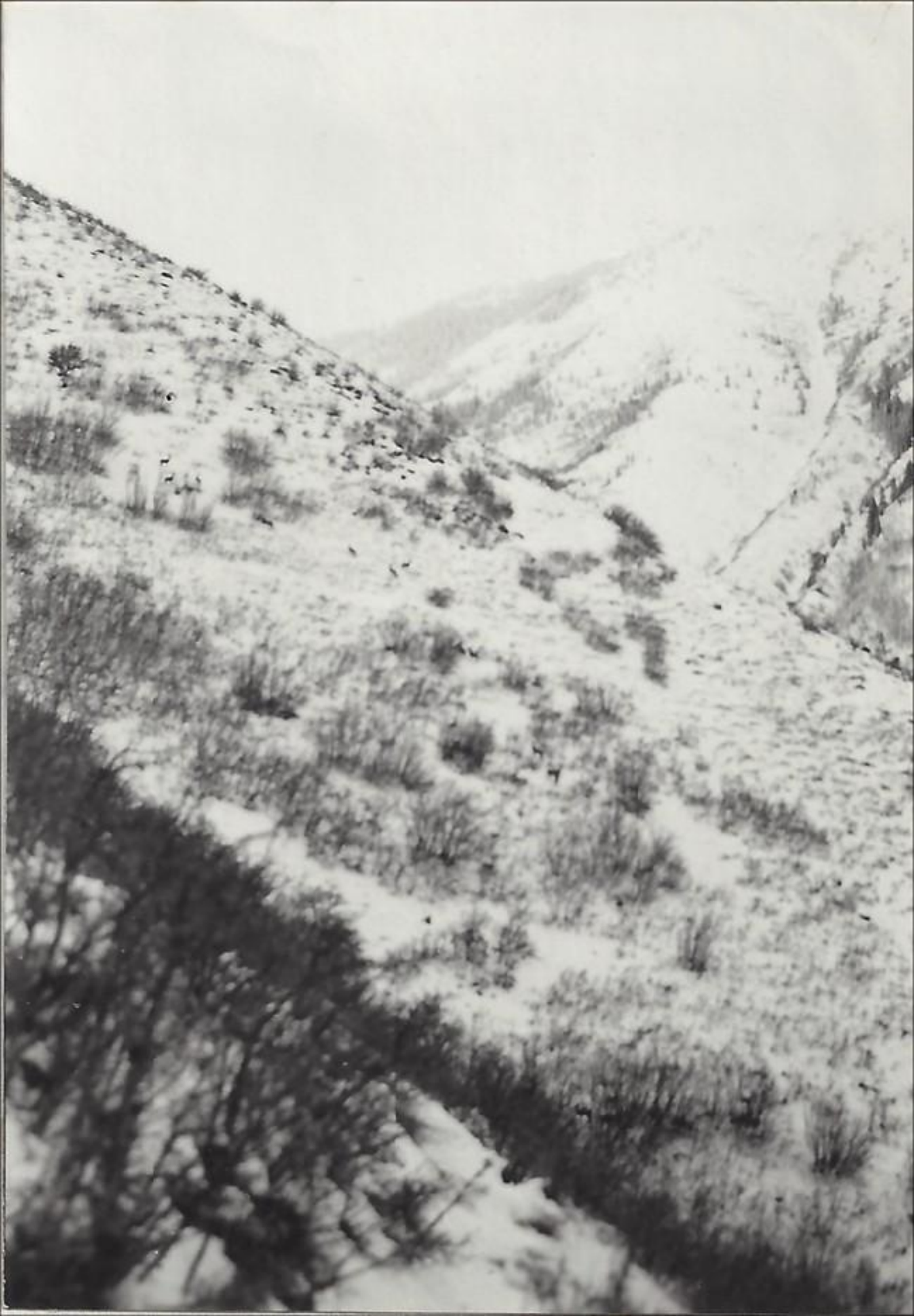


1-3-6-38



2-3-6-38





The greatest thrill awaited us on our return trip. The portion of the trail represented by continual turning was a skiers paridise, rather step and harbauring dangerous slide but perfect snow and an uninterupted course of smoath surfaced snow. The slope was 45° and too steep to even manipulate turns without a fael or gaining to much sped. If the day had not been cold and sunless we would have never made the ascent at this point but mustering courage faclaued its apparent precipitous sides its entire length. From the valley it appears to be a long, conspicious slope of a continuous nature. Again reserving space for a picture that will not of any value except as a record. Soaking up a portion of this slope on our return trip. 1/25 × 8. The remained of our trip did not bear any significant incidents, arriving at Car at twilight.

discarded

Notice on drawing of mt that all point designated as (3) are on same level though pitching to the south. Also all points (4) take on same plan. ~~This is responsible~~ The persistent dip of the beds to the south ~~of the mt.~~ (if they do.) is responsible for the apparent uniform erasion of this level sections of the ridges. Note also how the ends of the facelete spurs turn up before the drop abruptly down the erasional facet surface.

2/8/38 Method for preparation of mallophoga and small insects.

1. Boil KOH (3%) sol. 2-5 min.
2. Press out contents (in KOH)
3. H_2O in watch glass (1½ full) Add 1 drop HCL (10% sol.)
4. Add ROH (95%) 15 mi until dish is full - let stand 1 hr or less
5. stain - 1-2 hrs.
6. Trans - to 95% ROH and wash out stain. (Destain with few drops Na_2CO_3 + trans to neut. ROH
7. Then Carbolic Acid (35 gr. carbolic acid crystals to 75 cc. pure xylol.
8. mount on slide.

Drop method

3/13/38. Spent the day on Mapleton mt. starting from mouth of Spanish Fork River and working north along Lake Bonneville Level to within one or two mile of the mouth of Mapleton Canyon. Weather irregular with especially high wind from Spanish Fork Canyon.

Birds and Animals seen:

Three Golden eagles. One possibly a duplication. The one was seen flying low along side hill towards the north. The other two also flying north but near top of mt.

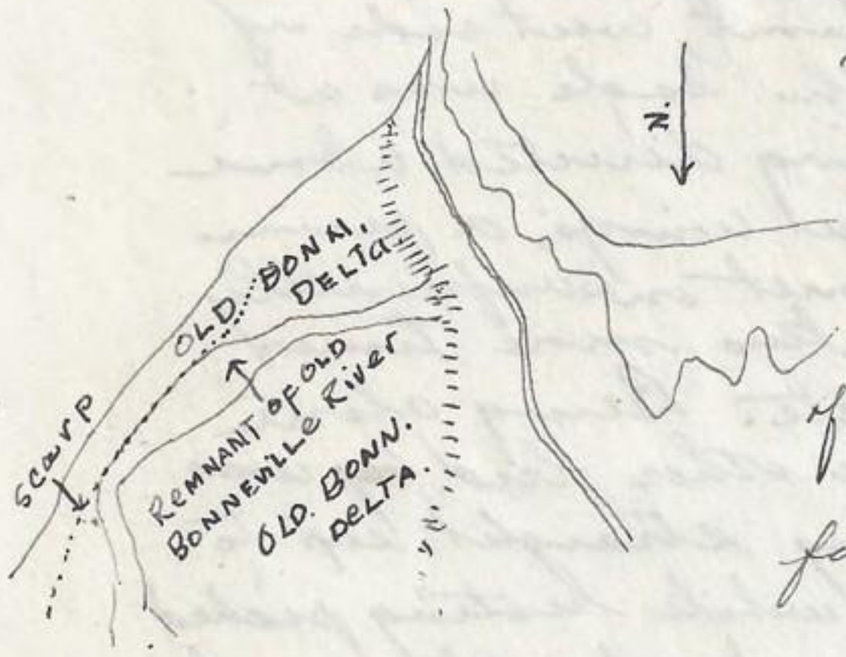
Two Am. Ravens. Seen flying south at high altitude. Sailing mainly and offering characteristic cawing. Flew south along mt and the turned west and headed directly into oncoming storm cloud.

Cottontail. Three seen along course taken.

Mule Deer. Only 15 deer were seen on trip, mainly seen feeding on ridge. Last weeks survey listed 130 but on ~~today~~ trip did not investigate canyons proper but located only those that could be plainly seen from Lake Bonneville Level.

Juncos. Shufeldt (?) Several small flocks were seen but nothing compared in numbers with the usual winter flocks. (Comparing with flocks seen on trips and down foothills.)

The delta of old Lake Bonneville certainly presents an interesting geological problem. Took one picture showing big pond and apparent faulting that was more probably due to old river channel that at one time run along the extreme east side of delta along mt. edge. The streams or waters from gullies of that side have not eroded into the apparent scarp along this course near mouth of canyon.



The old Bonneville River Channel is still preserved on delta. Cut off from source at present. The remaining beds of the old delta are the right flanks of a convex delta. A peculiar red formation appears above the old Bonneville Level on either side of the mouth of Sp. Fork Canyon. Its origin is confusing. Noticed again today that shrubs in fallows directed after a storm cloud.

3/19/38. Dad, Prof. Hayward & myself examined Eagle nesting site up Grave Creek, Ut. Co., The nest did not show any signs of habitation, without any addition to last years nest. No birds (Eagles) were seen near nesting site. Evidently the early date and unfavorable weather caused a postponement of their nesting period. The most interesting site on the entire trip was the observation of a coyote. It was seen slowly working up hillside without any apparent indication of anxiety. Stopped stop occasionally to investigate tree stumps and snow. It finally gained top of ridge and past out of site without the knowledge of our presence. A most beautiful site to see a Coyote working a hillside in a natural state. Many tracks were seen with several cases of interesting patterns. In two instances the animal had increased his stride from a ordinary gait to one of a running gate - to ~~ply~~ stop abruptly at edge of hill. This occurred in approaching the edge of a hill or ridge. It would appear as if the coyote purposely attempted to frighten anything that might be feeding just under crest of hill - Heard Coyotes ~~babbling~~ about 1 hr. after seeing lone Coyote.

380320-37

3/20/38. Spent the day at Brighton with Cal. Bee, Joe Seethaler and Graneman. Open road to Brighton, excellent snow surface and only comfortably populated. In the after noon dust rose from the valley and blew across the heights. In great enough quantities to fairly darken the country and give a peculiar yellow mellow cast to the surface. Glared shiing and even got in eyes. Skied on hill above hotel and on fairly hill about 1/2 mile down canyon. Strong wind blew all day but not objectionable. On way home were caught in traffic congestion between Point of mt. & Lehi. 600 cars were stalled and were not out of jam for five hours. Being early on our return, missed the greater part of the jam, however, were at least three hours. facing the blizzard and moving snail pace along only lane of four lanes open. Arrived home shortly after 9 o'clock.

3/26/38. Dad and I were on the trail of the Golden Eagle today. Visited old nest site on Lake mt. situated in upper nest. The nest is located at head of canyon leading directly west from old Calcute mine near pelican point, west side of Utah lake, Ut. Co. The first site of the eagle was at the mouth of Canyon. Our attention being directed above by the sound of a whirring of powerful wings; a prairie falcon (?) and the eagle had just met on unfriendly mission. The bird was seen alone two more times before nearing vicinity of nesting site. Being alone was very good indication that the other bird was on nest. At base of gulch leading straight up to nest we paused for a moment and while resting picked up the bird soaring near upper crest of mt on adjacent ridge. to ridge supporting the nest. We were within two blocks of nest when this observation was made; interesting because the identical action has been observed and duplicate on several other occasions on nesting approaching eagle nesting sites. The bird was seen to alight in a juniper tree near top of ridge. It went through several vigorous action but could not tell whether or not had broken loose a branch. After about a minute at this tree it headed straight for the nest being now about a little higher than the nest and on ridge terminating the canyon proper. as it near the nest it partially closed wings and shot itself straight for nesting tree. Checking its speed it alighted upon the nest. A few seconds later a bird left nest but would not know whether the same bird which just arrived or the brooding bird, however, one bird left immediately on the arrival of the other bearing the branch. Followed with glasses for apprat. 25 sec. and then focused them again the nest and, behold,

the other bird was just leaving. The second bird followed the first over the ridge and out of site for the remainder of our 2 or 3 hr. visit. On examination of nest found it to bear only one egg; a beautiful rufus colored specimen more color than usual. The fir, mahogany and juniper branches covered the upper surface of the last years nest but not as extensive as it will probably become as time goes on. There is a noticeable contrast between this upper nest and the alternate nest just below, both on some side hill one being just under rimb of mt top and the other directly below (approx. 400 ft) near bottom of canyon. The side hill is completly covered with mahogany, fir and juniper taking on a massive and dense covering when viewed from canyon floor. The upper tree is a Douglas fir. (Ps. m.) towering some 50' or 60' with the nest placed in upper portion, bulky and very conspicuous, while the alternate and lower tree (Pseudo. mu.) conceals the nest in its lower branches. This picture will show the nearness of the upper nest to ridge and also the degree of snow that still remains upon the entire mt side from recurved drift on top to floor of canyon. The snow was not crusted but allowed one to walk on top without sinking to knees. While plotting my route from the base of the nest to top platform found a hole in mass of sticks that was used by some kind of animal. One's worries just begin when trying to gain top of nest even after reaching base for it generally occurs that the nest is bulging on all sides and there is a limit to which a human can conquer a eagle nest like a fly walking on a ceiling. The nest is so situated and consists of such a mass of sticks that one never knows when the upper part of the ~~nest~~ tree might snap off. Have known of case where the continued accumulation of nesting material has been too much for the tree to support, just a chance one takes but I don't see why the wind should have to keep one reminded of such a calamity when it erradically sways the tree. Could see the one eggs with the hand mirror



4-3-26-38


upper nest

attached → to long ↑ twig and inserted above and along side of nest. Not being satisfied with viewing a eagle nest & egg through a mirror took one long breath and attempted the antics of a Deptera. The egg was there alright a - what a site to behold. One glance, under the conditions & then my immediate descent to more stable grounds. An eagle nest & egg is a thrilling site to view but, am sure something else was responsible for the rapid beating of pulse. (See appendix following 4/7/38)

ANIMALS and Birds SEEN.

Bluebird. From the bridge crossing the Jordan River to where road approaches mountain proper about 2 miles directly south of Wolffenden's the bluebirds were continually flying up from fence wires and pole line in advance of the car, never a moment without a bluebird interdence.

Marsh Hawk. Two marsh hawks seen along road to calcite mine & eagle Canyon. One near Jordan River the other on hillside south of Wolffenden's. One seen on return trip. No other hawks seen except eagles & falcon.

Raven. Nine seen at one time near eagle country. Two were frequently seen in air and no doubt nest in old cliffs over ridge north of eagle nest. The ravens spent their time in either spiral gyrations or coasting with wind. Calling many times.

T. Saltiani. near eagle nest, one bird.

Flicker. Heard near mouth of canyon leading to eagle nest.

P. Siskin. One flock in eagle Canyon.

L. E. Owl. One owl frightened from juniper about 1/2 way up Canyon, another in same gulch as eagle. Just as we started up Canyon frightened me from maples.

Chipmunks (2 sp.?) Only one seen on trip. It was near rock slide area.

Blackbirds, R.W. Several seen on road to Lehi and just out of Lehi on way to Jordan River.

Mr. Wolffenden son says that the Pelicans have not returned yet. Could not see any from our advantageous viewpoint on mt-side either.

Deer. Mule. 9 in no. at mouth of Canyon in maples and cedars. These deer were not quite satisfied until a ridge was put between them & the encroacher. No horned members. Also one dead deer that coyotes had completely eaten. Found in main gulch about 1/2 way Canyon

Coyotes. Several used canyon floor or 380320-40 trail, gulch as →
Woodhouse Jay. One seen and heard calling near mouth of Canyon.
Junco! More than usually seen ranging mainly in lower flats & mouth of Canyon. My guess would be montanas & Shufeldts.
Spurred Towhee. Seen & heard singing near mouth of Canyon.
Jack Rabbit. Three jumped on flats below. ambuled off leasurely.
Cottontail. Several tracks seen on higher levels.
Ground Dog. (mole) 18 counted on road from the old pumps to where we turned off for Eagle Canyon.
Raven. While working up snow covered slope of eagle nesting site noticed in many cases of stained snow under the mahogany. On close examination found them to be dropping of some bird probably dropped during night when roosting in the mahogany. The droppings were mainly the gizzards, skins, and stained excrement from the juniper berries. Their roosting trees were quite extensive. It is possible that they could be the Raven.

3/27/38 Left home in morning for Brighton for a day of skiing. Harry Thomas, Jack Rupert, Blaine Carlson and myself made the trip in Harry's car. At point of mountain saw about 150 crows feeding in field alongside of road. The road was practically cleared of snow and ice but remained slightly muddy near upper end of course. The skiing was ideal especially the padded trails. Took picture of mt. South of the lodge showing the down hill course covered by the Australian Cossmon and our own Alf. Engen. The exposure was 1/25 sec and 28 opening.



1- 3-27-38
(see p. 41.4, enlargement)



2-3-27-38

Pausing before the descent. East of Lodge on trail. 1/25 × 22 opening.





Saute of Lodge looking ↗ across open expanse and down hill run.
'25 x 22



380327-41

The slalom course was laid out on hill side about N.E of Lodge. Engen + Caseman gave exhibition runs. The snow had melted but very little since our visit the week before. The weather was fine and many skiers decorated the affair. Left the skiing grounds rather late but arrived at home in plenty of time. Seen rock squirrel at mouth of Big Cotton wood Canyon

3/31/38. Craig Wayman + I visited the Sand Dunes. 1.7 mi. west of Curtis Station. Hurriedly set 16 traps on dunes and then spent about 3/4 hr. walking along railroad tracks before making second visit along line to pick up catch. The sun had just set and before completing the set was late twilight. The sands were quite active and showed considerable movement since my last visit some two months before. One could readily see that the 40 animals taken before had its immediate effect upon the population. The numbers were nothing compared to the conditions found on first visit, lacking the community development. Six animals were taken on this trip, all in fine condition. 4 ♂ and 2 ♀. Being in the trap for only 1½ hrs, had not time to injure their mouths from the tiny contact between trap lid and can proper. Used wheat for food. While waiting for traps heard three Wilson snipe in air giving their aereal calls as produced by wings. Saw 6 pheasants were frightened from their nights roosts in the grass. On approaching the area saw one rabbit as it bobbed through sage brush east of dunes. Approx. 14 ducks, including 2 mallard as possible identification, were seen flying around area after twilight.

4/1/38. C Lynn Hayward, Dad + myself made second visit to eagle nest in Grave Creek. The snows were crusted and permitted one to walk upon the surface without falling through. On way up trail paused to watch eagle. It made its first appearance from the north sliding south across canyon with partially closed wings. When seen to be headed straight for old nest felt sure that they had decided to start nesting, however on nearing opposite side turned abruptly west and sailed down canyon alighting on high prominent cliff about 2 blocks from nest used last year. It only remained at nest for a second or two and then flew up canyon again only to stop on lower cliff half way between the two nests. During the entire maneuvers from the time he was first sighted until alighting upon rock he carried something in talons Time 12:30. Watched the bird feed on prey for 5 or six minutes until snow from cloud blowing up canyon, place a screen between our point on trail + the eagle.



1-3-27-38 TWP

INSERT 380331-41.1
(see page 40)





380331-42

DUTY TO SELF | DUTY TO GOD AND COUNTRY | DUTY TO OTHERS

"BE PREPARED"

BOY SCOUTS OF AMERICA

CHARTERED BY CONGRESS
JUNE 15, 1916

This is to Certify that

THE COMMUNITY CHURCH

having made proper application through its duly authorized representative to carry out the program of the Boy Scouts of America for

CHARACTER BUILDING : AMERICANIZATION : CITIZENSHIP TRAINING

is hereby granted this annual charter subject to the provisions of the Constitution and By-Laws and rules and regulations of the National Council of the Boy Scouts of America for one year.

Troop
#51, PROVO, UTAH

TROOP COMMITTEE

F.R. HITCHCOCK, CHM'N.
CLYDE SCOTT
W.E. SEARS
F.R. NEWELL

SCOUTMASTER
JAMES W. BEE

ASSISTANT SCOUTMASTER
HARRY P. CHANDLER
RAY SNOW
HARRY THOMAS

The above-mentioned officials, having been duly certified, are officially registered by the National Council to meet the responsibilities of their respective offices in accordance with the provisions of the Constitution and By-Laws of the Boy Scouts of America.

In TESTIMONY WHEREOF the National Council of the Boy Scouts of America has caused this charter to be signed by its officers and its corporate seal to be affixed.

HONORARY PRESIDENT

HONORARY VICE-PRESIDENT

HONORARY VICE-PRESIDENT

HONORARY VICE-PRESIDENT

PRESIDENT

NATIONAL SCOUT COMMISSIONER

CHIEF SCOUT EXECUTIVE

DATED March 31, 1938

591

"DO A GOOD TURN DAILY"

TRUSTWORTHY · LOYAL · HELPFUL · FRIENDLY · COURTEOUS · KIND · OBEDIENT · CHEERFUL · THRIFTY · BRAVE · CLEAN · REVERENT

BE PREPARED

His motions when observed feeding were rather vigorous, pulling at prey about every 2 seconds, occasionly he would stop and turn head for inspection of country. I used graded trail to head of canyon and then followed crest of ridge to nest. The bird was seen frequenting the immediate area. Arriving at cliff where bird was seen to alighted the first time she peared over ledge to see bird sitting on eggs about 60' below. Her eagle eye soon detected our presence and with a graceful takeoff flew out over the canyon. After flying down canyon four about a block she commenced to again altitude in two right hand circles and then one left hand circle, being now at a sufficient height to she flew or rather sailed directly south, pausing for two more circles before she passed entirely from our vision. Neither of the birds were seen again during our short stay at nest and remained of trip to mouth of canyon. The nest was situated in a high cliff on the south side of Grave canyon along side of the most prominent cliff as skyline seen from trail. Directly south of cliff on apex of anticline is found the reservoir for the Battlecreek Power Plant. The cliff proper is possibly 200 feet high with the nest placed 58 feet from top. The eggs when viewed from the adjacent ledge appeared to be about 1/2 the normal size. Green fir boughs covered the upper surface of nest. One of the most interesting birds seen on trip was the Rocky mt. Pine Grosbeak. These birds, two in number, were seen on divide between Grave + Battle creek near rimb of Grove Creek Canyon. On close examination found them to be feeding upon the buds of the Chokecherry. At point where trail crosses the main Grave Creek, seen a waterouzel. The ouzel has been seen on several occasions during the winter. S. Lyn Hayward took two pictures of snowshoe rabbit at 10 and 4 feet, acted as if it had young. Absolutely fearless.

4/2/38. Collected set of three eagle eggs of nest noted above the day before. Ray Snow, Harry Chandler, Harry Thomas and myself spent the day in procurring the eggs. Ray performed the honors. Securely tied he was lowered down cliff. When at nest, about 8 feet more rope of the 75 foot rope was left. The actual distance from top was appros 58 fet. To drop from nest would necessitate travelling twice as far. The nest was composed of old dried sticks probably being used previously. Upon this mass of sticks was placed a covering of new Abies concolor branches measuring 36" in diameter. These green boughs were placed only upon the top portion of the nest. The cup was about 16 inches in deameter and 4" in depth. Odd materials in association with the nest structure was a 16 cell portion of a hornets nest. Rabbit hair, down feathers from the eagle (?), were also found on top of nest. The nest proper was placed in a protected niche with

a ~~two foot~~ hanging cliff protruding 2 feet beyond nest. Sheltered from rains but not protected from the driving snows The lower ½tent of nest was covered with snow and ~~sticks~~ mixed in the upper branches below the green boows was packed snow. The three eggs were resting directly upon the green boows and were still warm when reached by Ray. When the nest was approached had planned to, ~~pass~~ over crest of upper cliff and watch bird on nest, however, she soon recognized our presence and soon left. Rising gracefully she turn around and with a gently pushoff was soon on her outstretched wings. She flew down canyon for about 2 blocks circled 2 or three times then south out of site. Neither of birds presented themselves during the visit. The only time the bird was seen on entire trip was just a short period when leaving nest. Eggs with data are now in collection. At head of Grove observed the R. Wt. Creeper feeding on maple, would fly to base of one tree and work up branches then to the base of another. The L.T. Chickadee was observed and the C. R. Co. Kinglet was also heard (?). One Bakefield Woodpecker and one flicker were heard and seen.

4/2/38 Stopped in at Hutchings. They informed us that Mr. Walpenden had observed the Sandhill Crane about two weeks ago. The were feeding in fields near his home and when making their exit flew straight toward Dry Creek Canyon.

4/3/38. Spent today on west side of Lake Mountain. with Dad. Leaving car at mouth of Canyon directly east of the south terminal of Juniper grove at north end of Lake Mt. walked south along mt. about 3/5 way to top. Covered the conspicuous cliffs just below growth of Junipers. These cliffs are about 40 or 50 feet high on the average extending north & south for about a mile or so. They make their first appearance along the mountain side at a point where the dense Junipers begin to hugh the higher mountain top. The first nest supported six eggs of the Raven. The nest was placed in fissure of cliff near top of cliff where overhanging ledge boulders gave a protective covering. 3' Below the new nest was the structure of a nest probably used previous years. and below this old structure again was the nest used many years previous. All somewhat alike. In the more distant recesses of the fissure, bording the present nest was the accumulation of the desert pack rat. The pack rat nest was recently constructed because it bore the sign of freshness. It is often been a problem to me to understand just how these birds, hawks, and eagles, tolerate the desert rat. The structure of the nest was rather peculiar. The entire nest represented a series of successive layers of large patches of wool (about the size of the hand) and layers of cedar bark. The inner cup lining was of wool,

deer hair, shredds of Juniper bark and → traces of horse → hair. The cup about four inches in depth. In examining the bottom of the cliff observed the track of a Coyote that had evidently attempted to reach the nest. The birds remained near by during entire visit, flying ~~overhead~~ and along side of cliff. Whenever one is near a nesting site the birds generally make themselves generally known, especially with their Cawing calls. The second nest along the series of cliff supported three eggs of the Prairie Falcon. It had placed them in a old Raven nest, the platform of which had been flattened out. Both bird near at all times but not as aggressive as some when eggs are further along in incubation. This nest was placed on side of cliff about 21 feet from bottom of ledge and 20 feet from top. At end of prominent series of cliffs found the nest of the R. Red-Tail and its two eggs. The nest was very accessible and was normal in structure. The bird was seen on the nest. It raised first and stood looking at me for some time then flew. It remain near on top of Juniper offering its resenting calls. It had a rather weak and young sounding voice. Along the entire course examined about 8 old nest the only ones being used were the Raven, Falcon & Red tail. Only the raven set was taken. Also followed the tracks of a Bobcat along cliff in snow. Saw eagle soaring near top of mountain. While returning to car along flats at base of mountain noticed that the entire country was highly perforated with holes and generally found in communities. Trails led from one hole to another and had been very extensively used, some being lined with the gravely from the holes. The ground at the centers of these sets of burrows was soil that had been brought up from the lower levels. The ground dog (mallo) were not seen but observed in 7 mi pass so am doubtful if any of these habitations had been used by the ground dog. If they had been in the country they would have most certainly made their presence. The only evidence that they are used by the nocturnal Dipodomys o. atlanticus is the presence of one partially dried animal found at the entrance of one of the burrows. Several pairs of desert horned Lark were seen feeding in more rocky situations of the alluvium at base of mountain. A ferruginous rough leg was frightened from ground on return trip to car. The Jacks were seen frequently, 8 & 9 in course of trip. One cottontail higher up on mountain side. Saw for the first time on Lake mountain the Autospermophiles, one annual that soon hide himself in hole in small cliff.

(appendix) [INSERT] 380403-47



Eagle pictures taken by Harry Chandler. Continuing notes of 4/2/38 of preceding page. Ray Snow returns with the set of three eggs. He braved the perils of the descent but his greatest fear was the handling of these eggs. Plenty of rope appears to be in evidence. Upper right & lower left showing nesting cliff. The small dark object representing the man controlling the upper end of rope, while suspended at the other end of the life line to Ray comfotably seated upon the





massive structure of the nest. The snow still remains upon the protected slope over the cliff and upon the mountain side below cliff. The snow covered the lower portion of the nest and is situated in such a position that the nest probably never receives any sunshine during the course of the day. The only radiation the nest will ever receive is from the Ray seated upon it now.

1-3-26-38

2-3-26-38

3-3-26-38

(insertion)

3/26/38. Panoramic view of Wasatch Range bordering the east side of Utah Valley and taken from the Eagle Nest slope near the top of Lake Mountain. Shows possibilities for representing county boundaries by photography. Granite Mt., Timp., Cascades and Provo Peak region as seen from left to right. (see notes of 3-26-38)

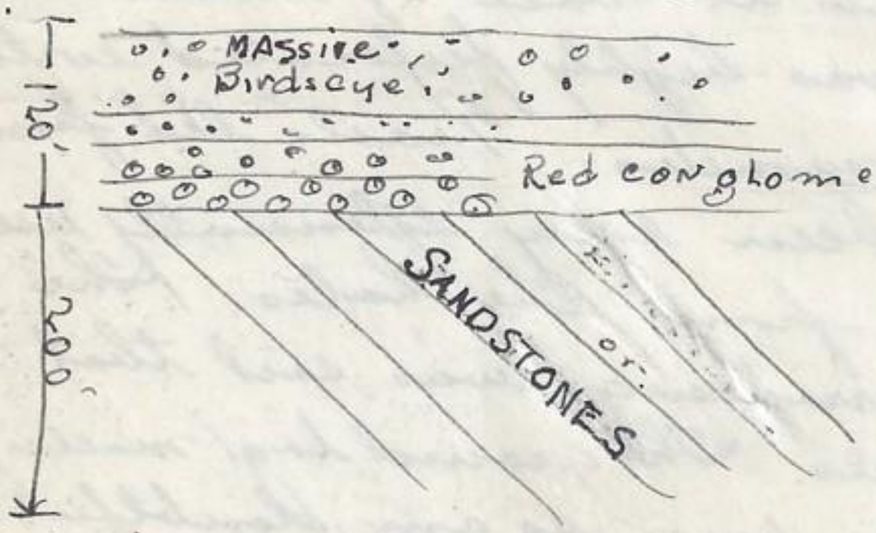






380404-46

4/4/38. Examined eagle nests in Hobble Creek situated on the left right hand fork of Canyon on north side of Canyon 2 mi up stream from C.C.C Camp. No new material had been placed upon the old structures. The two birds were seen, however, not a short distance from here. Have never seen the eagle nesting at this point before but have assumed they have used the site at one time or other as evidenced from the old fire bows covering the top of one nest. The birds were observed for about 20 minutes feeding along crest of mountain to the west. One bird let upon ridge and remained for several minutes then flew or rather sailed with partially closed wings to other side of main Canyon where it let upon an rock above some likely looking cliffs. Not the conspicuous birdseye stone but the strongly dipping permian rocks still further south. Remaining there for some time it soaring in straight line with closed wings to point where it left just 15 or 20 minutes before. This nest (present one considered) is a south exposure nest and is very unlikely that is used by eagle. That is if all previous cliff site are used as examples. The Oreoscoptes, Townsend solitaire, and rock wren were found just below cliffs. The contact in geological structures is very interesting here.



4/7/38. Patsel Loaders & myself slept at river tonite. Craig & Blaine making up party. The first bird to sing in morning was the Song Sparrow starting long before daylight. Heard another weird call during night but could not place it.

4/8/38 Entered dates 4/3/38, 3/36/38 and 4/1/38 as April 8, 1938
p. 47 p. 47 p. 48

[INSERT] 380408-48



By Hayward



By Hayward

4/1/38 While making our sliding descent upon the snow and fir covered slopes, directly below the eagle nesting cliff in Grove Creek, Prof. Hayward chanced to perceive a white rabbit like form. Stopping abruptly, not twenty feet from object, he discerned a white head and two conspicuous white ears peering over a large boulder at the base of a fir tree and recognizable at once as a snow shoe rabbit. Under the obscure and shaded protection at the base of this fir he sat motionless as if frozen to its position, while soft rays of sunshine, sifting through the green bows above, accentuated its apparentness against the darker trunk and recess of its chosen habitat. At a 10 foot distance an ordinary conversation could be carried on with any conspicuous movement we would care to make, even a sharp whistle would not deflect his form position. Observations at a closer distance than 4 feet would start a noticeable twitching of the nose and a reflex movement of body as if in attempt to jump. A closer approach would send him off with a hop and jump, never leaving the entrance of his rock lined burrow more than 10 or 12 feet behind and always within the protection offered by the fir tree. In our retreat from this entrance ~~into rocks~~ at base of fir the rabbit would immediately regain his former position. This process was repeated several time during our occasion to photograph him. Prof. Hayward experienced photographers luck today, in that he had only two films left and these being used on the subject before realizing that the model would pose in any position according to our demand. From the reations of this animal would be inclined to believe that the burrow he was so concerned about, housed a family of young rabbits because if he chose he could readily resort to protection in evidence on all sides.





4/12/38 Spent the afternoon at the first Ward 380412-49
of Provo City observing the movements of the ducks. Pastures south
Stationed myself on the prominent sand dunes situated about
3/4 miles south of Airoplane Field and from that point
could watch the ducks upon the ponds from the overflow
off the mill Race to the south and the Bullocks Fur Farm
to the East. The mill Race to the north swings out
around the dunes and many ducks were seen here. also
The mill Race Creek supports the City Sewer.
Arrived about 1 hour before sunset and
remained until late twilight. Three
C.C.C. men were tramping the fields and
were continually frightening the ducks
from the different portions of the sloughs,
so the arrival to the areas under
observation will not represent the
normal flight. Estimated about
500 birds in ponds & creek that
were under observation. The
number is conservative and probably
should represent a greater number.



The Baldpate dominated the numbers. The percentage
as near As I could account is Baldpate 60%, Gadwall 15%
Scaup 10%, Green wing Teal .05%, Red head .04%
Cinnamon Teal .03%, Mallard .02%, Shoveler .01%

Birds Seen

Baldpate: These birds were in the majority. Was
interesting to note the characteristics of the bird that
could be used as identification at distances ~~greater~~ that
~~does~~ ~~necessary~~ would not allow differentiation of
feather colors. The two most noticeable feature in ♂
are the white strip or banner in fore part of wing
and the sharp demarkation between the black under
tail coverets and the white belly. The wing patch can best be
seen when the birds are flying away from the observer or
wheeling to the right or left. in which instance a greater propor-
ion of the upper surface is showing. The birds in the air are
very noisy and lively their call sounding like a squeaking
rubber doll or ~~dog~~ rubber dog except the noise of the bird
would represent two forced squeaks instead of one. When
alighting they approach the water in retarded steps alighting
upon the water or land in a more gentle and less forceful
manner. Upon the land they managed themselves very
well.

Gadwall. Next to the Baldpate in numbers. The white patch at the ~~head~~ hind portion of wing  was diagnostic enough and was a character that was entirely used at for distanced when the bird presented an undifferentiated appearance except for the white patch. When at a closer range the black bordering the white patch was very noticeable. In alighting upon the water would represent the manner in which the mallard drops in.

Scaup. The scaup were in evidence especially noticeable when flying past with such great speed. The black head, neck & breast is sharply contrasted against the white belly. When upon the water they have a habit of tossing their heads up and down in a nodding fashion. The white cresent of the ♀ is discernable when in flight. They favored the creek instead of the ponds to the south.

Green Wing Teal. Several small flocks. The manner of alighting represents the most reckless and carefree style approaching the water with quick and sudden deviations of its course. It retains its great speed right up to the time it attempts to alight at which time it checks its speed with rapid and forceful reverse wing beats practically stopping himself in ~~the last~~ 5 or six feet. His abrupt stop is more of a plunge than a ~~glading~~ skip with breast cutting the waters before him. The head of the male when seen at a close range is about the most diagnostic feature. When the ponds were approached for the first time and again when leaving my past the green-wing teal were the first birds to leave. Also when the hawks would sail a little to near to assure safety the teal again would be the first to show concern and change their position.

Red heads. A few red heads were seen, generally flying overhead to creek on the north side of dams & creek course beyond. The red head could be seen quite distinctly when flying overhead.

Cinnamon Teal. Several feeding in pond, generally in pair & group of 3 & 4.

Mallards. The mallards seen were found feeding in the grasses & dry rushes.

Shoveller. About 5 birds were seen. Feeding separately but in pairs & single. The rufus sides,

white breast, black head, white area posterior to the rufus wing region were in decided contrast and represented a very showy and contrasting pattern. The lightness of the bird segregates the species from the more darker forms. It is generally quite concerned with its feeding and frequents the more shallow areas near the vegetation. The shoveller when alighting upon the water is more graceful in its approach. One would think that such a bird would find it difficult to land in the manner it does, Rather than making a plunging stop it drop nearly perpendicular alighting upon the water without much gliding fraction to bring it to a stop.

Other birds seen that evening were the Black-Crown Night Heron, Great Blue Heron, Snowy Heron, Marsh Hawks, Red wing, Meadowlark. Am Pipit (this bird has a deformed foot and was not able to use it however it still retained its power to bob up & down even upon one foot. Song Sparrow. (the rapid twitching of the tail from side to side, when alarmed was interesting.) 5 Curlew feeding in pastures, Short eared Owl, Calif Gull along creek and at mouth of sewer outlet. Pheasant, Savannah Sparrow. A migration to the north of the Tree or northern Violet Green Swallow was in full swing, 20 and 30 in air at certain periods but always flying in a northern direction. 48 Avocet dotted the pond. The Coot were confined to the creek proper or not far from it.

4/13/38. Visited same region as 4/12/38. In addition to the birds seen the day before are recorded the Pintail duck and the Golden Eye. Only two pintails were seen. The Golden eye was first seen setting upon the bank of the Mill Race east of the dunes. It was sitting facing me and except for its black head, was entirely white and looked like a gull when viewed without the glasses. When turned to one side it loses some of its whiteness and when back is presented to observer the takes on an entirely different picture as compared to the pure whiteness of the breast. The bird is however dominant white when seen and is readily separated from remaining species. The white eye circle is readily seen at quite a distance. When disturbed it flew over to ponds south of dunes and came to rest upon the shallow water. It lands entirely different from any other duck so far observed. It practically parallels the water and receives the surface at high speed.

when almost touching the water it will shoot out its feet and ride them entirely for 4 or 6 feet until it looses momentum at which time it gracefully lowers its body into water. It actually rides the surface like an aeroplane with pontons. The period he was on the shallow ponds was spent in resting. The avocets would favor this bird and one in particular never left the duck but would feed around it at short range. On its own initative it flew straight toward me not diveating to one side or the other, fly just over my head at 15 foot elevation. Had my glasses focused upon the oncoming bird the entire time & presented quite a site. It lit in creek just north of dune about 100 feet. After completing observations returned home by way of Mill race & when passing the point where this bird let after leaving pond had a good chance to observe its take off. It was resting upon the bank & when disturbed flew into water & then run upon its surface until gaining enough momentum to rise from the creek. A noticeable whistling accompanied the beating of wings. When in flight the head is nearer the body & larger than the ducks.

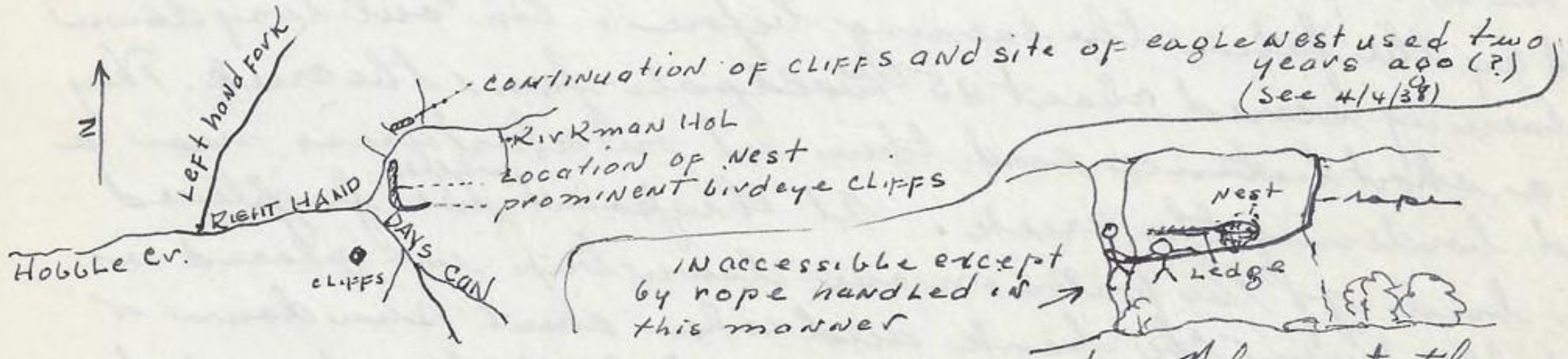
At 6:30 in evening
4/14/38. Took Bob Newell, Howard Hoover, Craig Hayman, Blaine Carlson, Douglas Bustard & Buckley Taylor to same observation point as of dates 4/12-13/38. While covering course of Mill Race on way down found the lone Golden eye in Creek near upper course. It flew upstream alighting in water again. Stalking it again we all observed its interesting nature. When approached to close flew again down Stream. Seen same ducks as observed previous days except the Pintail. The Green-wing Teal were in the majority today. On approaching the dune heard the call of the Prairie Falcon. It was quite concerned over one particular area bordering the pond. ~~Out of~~ ~~of spot~~. At one time it alighted near a dark object and things began to look suspicious. So investigated & found at 40 feet distance from the water edge a Green-winged Teal (♂) that had been killed only a short while before our arrival for it still retained its body heat. The falcon had only had time to pick off the feathers & skin of its entire neck from the region

immediately back of the head to the → exposed muscles ← of the breast. It was lying 6 feet from where feathers and fresh blood were lying upon the grass. The circumstances seemed to point toward the falcon as the killer, however, we did not actually see the act preformed. The avocets were still congregated on same pond. On our return trip at late twilight found the ducks to be increasing in their flight to the creek.

4/15/38. Blaine Carlson & I stepped down to the same area as listed in the last 3 days visitations. Same ducks seen except no Pintails again. The Scaup were predominant this evening. Infact the Gadwall, Balpate Teal, were not very well represented. One noticeable thing that was quite evident was that the birds seen today were in little groups and resting. Possibly 50 or 60 Coot bunched where the day before possibly 100 ducks had been actively feeding. There was a noticeable decreased in numbers of ducks except the Scaup which were well represented being apprat. 70 birds in the two small flocks that were upon the creek bank & in water. The Golden Eye was seen again today resting upon the bank (north end of dump) three other Scaup. This bird is no doubt the same bird seen the last two days in same area. The Goldeneye remained on bank after the Scaup had departed. The wings, (cleaned) skull and one or two breast bones was all that was left of the Duck killed by the falcon the evening before. On our way down this evening scared about 25 Baldpate from the creek. They flew a short distance and then lit on short grass near a pond bordering the creek. At this point (the) frightened these birds off the water on our down trips we placed a weed blind upon the bank and when about sun down & shortly after we stationed ourselves behind it and waited for action. The first duck to arrive was a single ♂ mallard alighting in center of creek and soon working up 3 foot bank to the top of the creek channel. This bird continually offered a low quacking noise not of the danger type. The second birds were two mallards that let upon the grassy bank about 50' from first one. Following were the Baldheads. Several pairs dropped in and could be identified. but by now it was so dark that only form could be distinguished at even 10 feet. Teal and possibly Balpate &

and Gadwall continued to arrive. The waters soon changed from a quiet flowing creek to creek churning continually from the diving birds. The ducks seemed to pretty well paired & never seemed to separate from one another. There was one rather deceptive call that still remains a question as to its owner. It sounded like a crying but of lower & fainter tone. When only 20 feet away would appear as if it were coming from a distant bend. My suspeccions would be that it is the red head at least I know that it leaves the water in the manner of a red-head. About 25 ducks left the water when we decided to leave that got of the surface like a red head or scaup. If the red-heads continued coming in like they started to at the first of the evening am sure that most of the ducks here were of that species. The creek at this point is rather fast flowing & is possibly 2 or 3' deep. Can readily see that many mite calls will have to be studied rather carefully before their callers identity can be disclosed.

4/16/38 Located nest of Golden Eagle in Hobble Creek. The previous week the birds were seen in this vicinty. (See notes of 4/4/38). The nest is located in the right-hand fork of Hobble Creek. in the conspicuous birdeye cliff on the right hand side of canyon. From the nest one can look directly

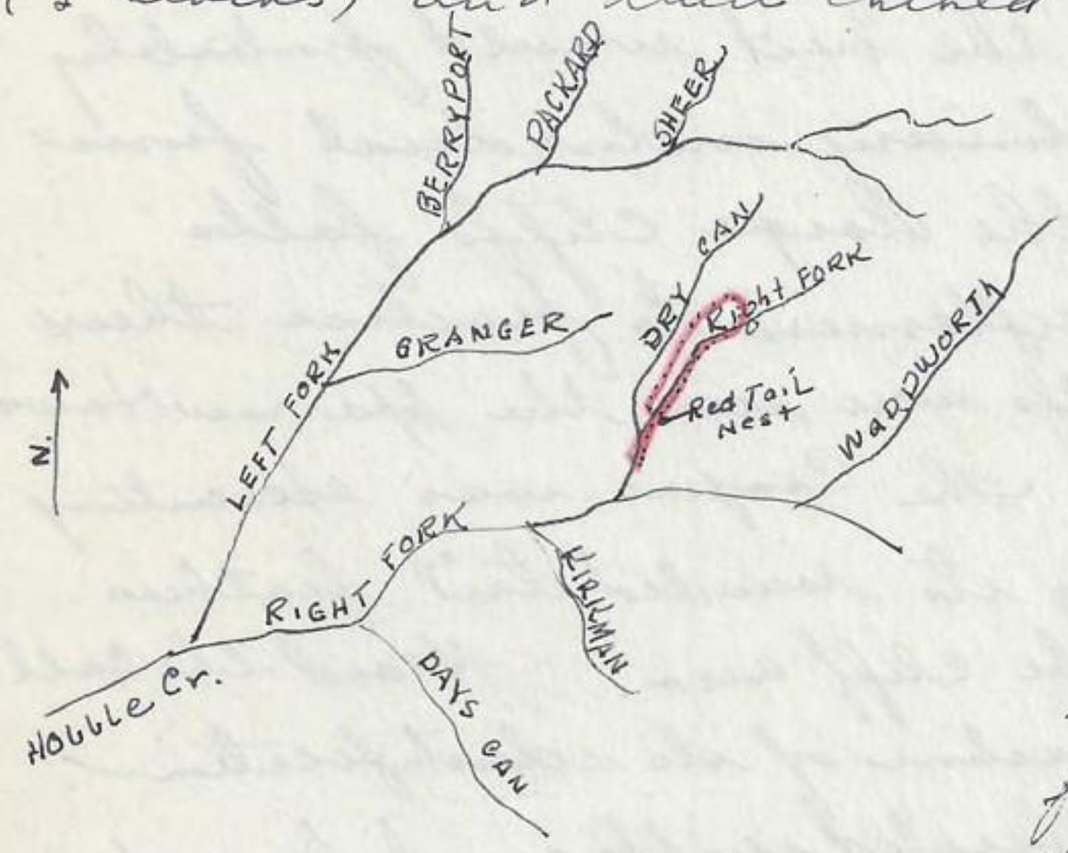


west down CANYON with the valley beyond to the mouth of Hobble Creek the cliffs stand out in bold relief ~~at the base~~ in the distance. At the point where the nest is located the cliff is about 68 feet high, the nest situated about 30' from the base of cliff. The overhanging rock above protects it from the elements in fact one would have to swing into nest if suspended from rope from above. An attached ledge of about 12 feet leads over to the nest which is at the outer limits of a small cave like depression which extended into the cliffs. The nest was on a level with the floor of the small cave. Upon the ~~nest was~~ old structure of the nest was

placed dead branches and limbs of the aspen, oak, maple, cottonwood and fir and upon this was a covering of white fir and douglas fir with the white fir predominating. The mat was several inches deep and covered the entire upper portion of the nest. Indications are that the nest had been prepared to receive the eggs but had been deserted after. No definite cup was discernable. Below could be seen the C.C.C. Camp used in summer and two parked cars whose occupants were enjoying the outing the day before Easter. The following day several hundred cars passed along the road below. With is new road comes the greater population of visitors with their accompanying rifles. While the nest would probably never be noticed by an ordinary individual from below, am just sure that the large cliffs falls prey to the desire of some riflemen to practice their distant shots. Near the cliffs were seen the Sparrow Hawk and Coopers hawks in flight. The Coopers was executing a series of spiral turns showing its rounded tail feathers. Four Sparrow Hawks favored the cliff area. Heard the call of the prairie falcon but not positive of its identification. Got one glimpse of the white-throated swift as it passed along the side of the cliffs. Two Canyon Wren were found to be extremely interested in a cavernous place just around the corner on the south exposure. Even while scanning the hole the bird were on hand sometimes on a few feet away. Saw one bird make three visits into one small hole and return with a wasp in its bill. She probably felt that if she could get the insects aroused she could win her battle. Hundreds of beetles were hing in small clusters upon the rocks of the cliff. On the extreme eastern end of the south exposure of the cliff was located the Red-tail nest in a very inaccessible place. Could not determine whether or not it held eggs but the birds were seen several times during our stay. The chipmunks & marmot were active at this time. While descending the ridge to car found the feather remains of a dusky grouse probably taken by eagle or goshawks, only feathers remained to bear mute evidence of the kill.

The porcupine had probably hibernated on these cliffs because quite a few small trees & shrubs were completely girdled & striped of their bark. This destruction seemed to be concentrated near eagle nest. The south exposure of these series of cliffs supported more lizard life than on west side at least more lizard presented themselves here. On our way up found a buck deer that had died sometime last spring for the velvet still remained upon portions of the horns. No eagles seen on this trip today.

4/17/38. Returned to Hobble Creek but did not see eagle today. Drove up Dry Canyon a short distance (3 blocks) and then hiked ~~up canyon~~ from there on. About 1 mi. up canyon from mouth of Dry Canyon, at the convergence of Dry & Right fork there is a central ridge that separates Dry & Right fork. This ridge that divides the two canyon that are nearly parallel is covered with oak, maple, sage brush & junipers. While following along its course found an interesting change in the vegetative association.

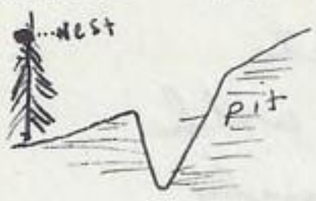


The lower limits of the ridge top was essentially sagebrush and juniper, not much grass between the small bushes. It was also more rocky and without the broad flat surface as found a little further on: ~~a little further on~~ Beyond ~~further on~~ the oaks increased, the top surface of ridge became broader and more sage brush dulled the surface. The upper limit of ridge supported more maple trees & still the top surface area increased in extent. The difference in elevation between the lower limit & upper end of ridge was very little, at least not of sufficient greatness to account for the difference in the vegetation. My observations were made from beginning of ridge at convergence of two canyon to point where the broad flat upper surface changes to a narrow, irregular ridge, where one intercepts the red & white sandstones that cross the ridge at this point.

Birds Seen

Red-Tail Hawk. At a point where Right Fork enters dry canyon & located the nest of a red-Tail. It was

situated in a fir (white) tree in bottom of canyon to the right of creek. Twenty feet directly east of nesting tree is an enormous hole or pit on side of canyon wall, possible 40' wide and 40' deep. It appears to be natural and of recent origin.



Threw a large rock at trunk of tree but did not receive any response. So assumed the ~~bird~~ nest was not inhabited, but while work up side of center ridge on opposit side of canyon could plainly see the bird on the nest. Threw several rock across canyon, several lighting in branches below nest. Once or twice the bird nearly left but it wasn't until a rock struck the side of tree near nest that she left. Without offering any crying note she gracefully sailed down canyon and out of site. A few seconds later the bird was seen flying down ridge just in front of me. Flying east across canyon it lit in a Juniper possibly 300 feet from nest. Her next stop was 100' in Juniper nearer her home. She then sail up hill side alighting in upper branches of Juniper. Her actions were not ordinary in that she did not permit the intrusion of a visitor in the same manner as many other red tails would do. I felt that it was because the rock frightened her from the nest and she did not attach any fault to me because I was on opposite side of canyon and considerable distance above her nest. The one bird was seen on this occasion.

L. T. Chickadee. Chickadees were seen along the entire course of the ridge especially on the broader portions of the top: feeding in oaks, maples & junipers. In small numbers possible 4 or 5 in group.

R.S. Flicker. Seen & heard the birds.

R.N. Sapsucker. One bird feeding on trunk of oak. I flew several times when approached to closely but always remained in same vicinity.

Utah Jay. Four birds in one flocks, several other individuals. Heard for first time the imitation of a small birds warble.

L.T. Towhee. Two birds flew up from ground beneath covering of large oak & maple when dog approached them. They ignored him & remained in same vicinity.

Chipmunks. Heard 5 and those seen at close range appeared to be minimus.

Porcupine. Tracks only. In upper canon but found one dead one in bottom of canyon.

G.H. Junco. Two lone individuals. They were rather hard to approach.

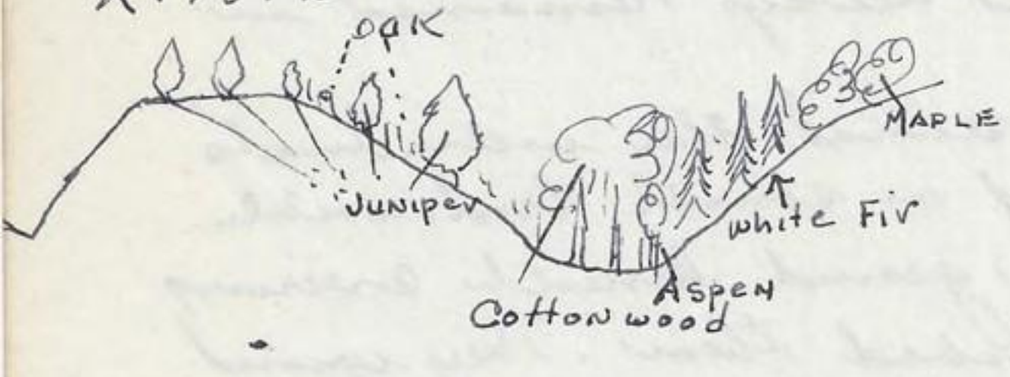
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G.R. Grouse One bird fairly tame.

Kingfisher. Heard & seen two bird in company with chickadees. Did not determine as to species.

Sciurus Found in oak tree and appeared rather confident in our presence. Jumping from oak into Juniper he remained silent on limb directly above with both feet on ~~branch~~ & tail over back. Could plainly see the yellow cast in tail hairs.

All the observations were made on the ridge-top proper. On returning followed the creek in Right fork. Very little life was noted here and ~~for~~ the scarcity was particularly contrasting with the route just covered. Observations made from 3:30 until about 5:30. No deer were seen but many tracks were ~~seen~~ observed, especially on trail of ridge and country around the red-rock outcroping at end of ridge. However two dead deer were inspected along way. One remained intact but the other showed signs of being eaten by a rat. Going by some animal having power to fragment the bones and larger members. Both in canyon bottom. Across several of the clay patches in trail the track of deer were plainly preserved. Some sinking an inch or two, other merely making an impression showing the difference in weight of the animals. One large tracks in particular made a very deep set pattern. One sprung was noted & so situated opposite the first red & white outcropping in the R. Fork to be seen on west side of canyon going up. This stream was clear while the main stream was muddy & torrential. Could see that to continue up Dry Canyon, over into the Narrows of the left Hand fork of Hobble Creek near Sheep Canyon would make an ideal trip some Sunday, leaving early in the morning, so that one could make sufficient observations of this interesting Canyon. A transect across the R. Fork would reveal something like this. The fir end abruptly on that creek edge while the junipers entirely occupy the west side of creek with cottonwood & aspen in canyon bottom proper.



4/23/38. Tried new blind for first time. Set-up on bank of mill race in first ward pasture about 1/2 mi south of air field, just beyond sand dune. Ten minutes after setting up blind about six coot congregated on opposite side of creek 15 feet away. Some preened their feathers, others fed in grass. 12 passed before review in course of a half an hour. Pheasants fed 30 feet away without

concern so possibly the blind was a success.
The Pintail, Red Head, Scaup, G.W. Teal and Gadwall were seen on way down to observation station.
Compared with conditions of about 8 day previous on a visit made then would say that the duck population was not representing anything the number as represented on the 13th & 14th. The only birds haunting the ponds that previously supported 400 or 500 hundred were practically barren except the presence of about 80 muddens. Two red head and a pair of G.W. Teal were all that were scared from the creek that was alive with ducks the visit of 14 day before. Both observations were made during the same time of day. Feel that possibly the main migration had passed on north but on return trip after dark the creek was just as alive of ducks as witnessed on any previous visit.
It may have been possible that they could have been disturbed during the afternoon I were not there when I made my observations. However the creek had dropped in water content considerable and the temporary lakes were not nearly as full as before. This fluctuation of water level may have had something to do with the decided decrease in numbers.

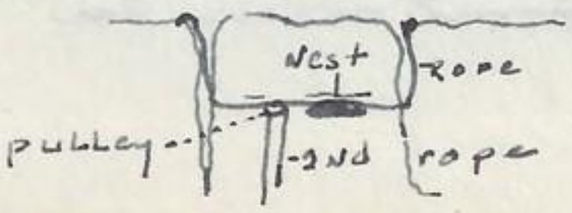
4/24/38. Covered route made yesterday in pastures below airport and seen the following birds. Observed about sundown 1 Golden eye, red heads (2), Green wing Teal, Mallards, and Gadwalls. The single golden eye flew up from creek and settled down in Cat Farm about 3 blocks to the S. E. It made a rather sudden descent into water.

4/27/38 Left home just as sun was sinking behind mountains to the west. Between the edge of town on 3 east and 6th south and the air port heard 5 meadowlark singing, heard one Killdeer, Robin and the call of the frog. Two different parts of the air field received the evening song of the Savannah Sparrow. Soon arrived at mill Race directly south of Air Port and proceeded to follow along its bank to a point where the water from the Bullocks Fur farms enters and a point where the creek begins to make its direct westerly course. Good light until on return trip. Birds seen on way down stream ~~were~~ and on water of stream were one mallard, seven Red Heads 3 of which were paired, 1 golden eye, seven Coot on lower end of course and heard voice of Western Yellow Throat (?) The Golden Eye flew over to Fur Farm and lit in water following the same procedure as of 4/24/38. When frightened from water it

was in company with 5 Red heads. The red head paddled along water & were soon in air but the Golden Eye found it necessary to run on water for about 15 feet before even leaving water surface. Even when off water he still had to gain more momentum before he finally race abruptly into air. This lone bird is nodaubt the same one seen on the the 13th, 14th, 15th, 24th of April. On returning, found that the creek took on a little more life than on the down trip. Twilight was set in now and was difficult to recognize the birds at even a close distance. The birds definitely identified before it got to late was 2 Gadwalls, 5 pairs of red heads and four Green-wing Teal, about 30 other ducks had settled in creek that I had just covered only about 1/2 hr ago. Could not identify as to species but they represented both ducks that leave water abruptly and those that sped along water surface before getting into air, probably red heads, mallards, gadwalls and G-W. Teal. Establish quite definitely the ~~owner~~ of that peculiar syringe call. a call that is quite deceptive in that it sounds as if it comes from same distance when really within only 20 feet from one. The sound is not very laud and has a more muffled and nat a mechanical tone. Two pairs of red heads were in creek and could be positively identified. Lying in the bunk could hear one of the four birds offering this call. Besides this call the red heads has a very similar call to the mallard but offered more rapidly. Heard another more like call overhead and while it remain in air for a minute or so assumed that it might be something else beside a duck of some sort. While the Golden Eye was flying to Sun Down two red heads ~~flew up~~ approached from behind and soon passed him flying with a much greater speed than the Golden Eye:

5/1/38. Dad, Harry Chandler and myself left home about 10:30 Sunday and drove up to point where Days Canyon issues into the Right Hand Fork of Hubble Creek. Leaving our car at this point we proceeded up the ridge between Days & R. Hand Fork to conspicuous birdseye cliffs, high up ridge to the east. This ridge, at this time of year is quite passible in its entire length. Several species of flowers were in blossom, that the preceding week were not nearly so evident. The Cottonwoods bording the lower limits of Days Canyon also were in a

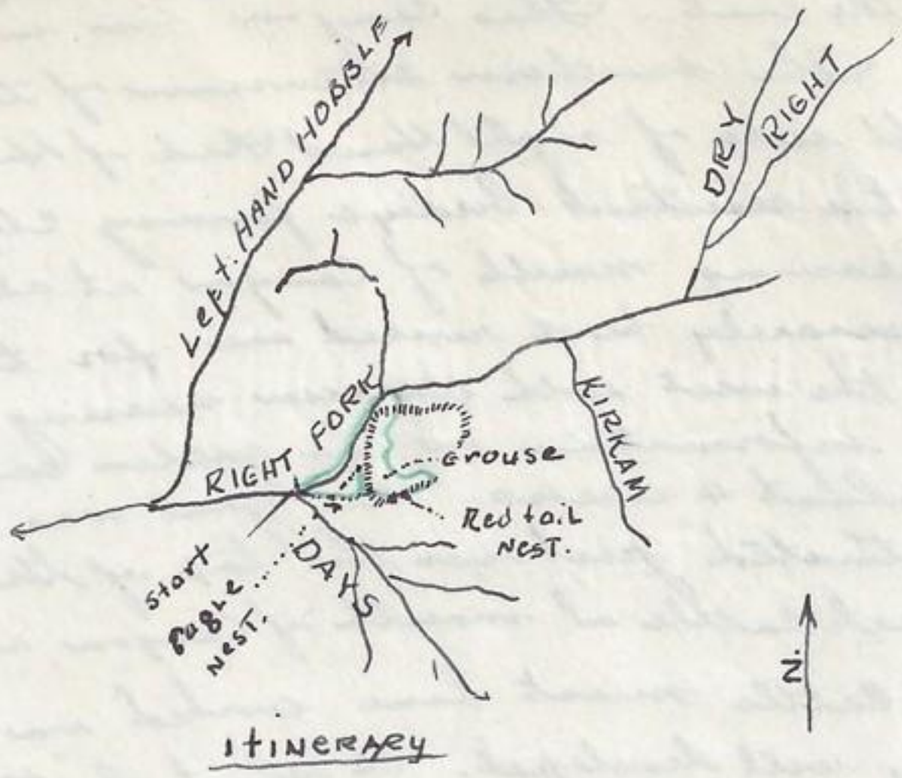
yellowish + greenish cast that the week before were quite dull + clear less. When about half way up the ridge were picked out two deer feeding on side hill across canyon on right side of Days. At first the one appeared as if it may be an albino but proved to be just like all the other deer seen during the day. However the color was extremely light in contrast to green foliage. Before he finally reached our destination at the base of the conspicuous cliffs on top we had recorded 12 deer from the hillside where these two were first observed. One group of six were feeding in brush about 300 up hillside, some occasionally resting upon ground. Two fed together and a group of 4 milled along on side hill near edge of ridge leading down into Hobble Cr. They appeared to be quite unconcerned about our presence. From a point at base of cliffs watch two deer feeding among oak, maple + Chokecherry (?) just below on just left hand fork of Days. Feeding on browse and pawing in earth at base of tree for acorns or mushrooms. Just below cliffs on small flat platforms on ridge we frightened two Dusky Grouse. One on ridge proper and another one down side hill to the right about 100 feet. On nearing the eagle nest vested + described 4/16/38 we kept an eye upon the area for any activity but on arrival found that the buds had not reinhabited the nest that had been abondened on about the 10th of April. On checking on the campers in camp near the vicinity found that ~~he~~ one part of man + wife had been there for three weeks. They claimed to have done quite a little hiking around mountains and visited the old alternate eagle nest that we visited on the 4th of April. This may explain the apparent desertion of this old nesting area by the eagles and the desertion of the nest that had been already prepared except the laying of the eggs. Incidently they claimed to have seen the badger, and two bats. The bats being observed on small cave just above the first camp site about (1 mile) the C.C.C. Camp. Our attempt to gain access to nest failed but are now assured of a method that will be safe + practical for any subsequent desires to permit this nest. To do this trick one must tie one above + then run down around over hanging portion of ledge then completely back up other side to top of ledge again. Insert pulley + with second rope draw one up to platform. Ropes must be 50 foot + 100 foot lengths.



380501-62

Saw the Canyon Wren, Sharp-shin, Sparrow Hawk & Coopers hawk again. The red-tail nest at the end of the eastern extention of the cliffs did not have an occupant. Leaving dad at this point Harry & I went over top & investigated the heads of the three or four small draws that finally enter Saddle Creek just above the Camp Grounds below & opposite the old eagle nest & other side of Canyon. While working our way across these flats we found two Maple Trees that were entirely out of proportion to the small & normal size maple trees that were found in association with them. They towered into the air for about 45' and had such a large circumference at base that Harry's attempt to reach around ~~them~~ ~~to~~ one with both arms & hands lack about 8 inches from meeting on the other side. This measurement was taken about 4 feet from ground & did not involve the large base of tree. Two trees stood together, the one tall and straight the other large around but not as tall. The buds were just beginning to develop and were about as large as a penny with green leaves tender enough for a Sunday Salad. These trees were near top of ridge about directly due north from hawks nest in cliffs over the ridge & to the south on main birdeye ledges. Near these large maples we came heard the throbbing call of the Gray-Ruffed Grouse. It drumming sounded near so we proceeded to stalk in the direction from which came the sound. After several progressive movements we were finally within possibly 60 or 70 feet of the bird. It like we were not able to detect any bird were we sure it was there for every vibration of the wings could be plainly heard. Another bird was just below evidently vieing for control of the area. Walked across the small ravine and when on other side heard again the drumming practically at identical place we crossed. The thrubbing sounds were heard for several minutes while in that area being offered about every 3 or 4 minutes. This more or less flat top mountain capped with birdeye marble make an ideal place for these birds. Aspen, maple and oak dominate the covering. Dropped down trail into camp site and then followed road to point where car had been left.

380501-63



ITINERARY



1-5-1-38

Looking directly west, down canyon from the eagle nest cliff showing the type of canyon that may have been made from glacial work originating from higher peak in the left hand fork of Hobble Creek. During our work at the eagle nest, several squalls came up the main canyon only to be followed by more sunshine. This is a period when clouds began to raise after the general stormy period which included rains, snow & hail. 31 deer were seen on day trip. Did not see eagles at any time.

5/1/38 — Left car at canyon just to the left of the low and conspicuous buckeye marble cliffs on left side of Right hand fork of Hobble. Proceeded up canyon supporting stream to head and then on ridge. Traveled it entire length to the south then back again to eastpronment red & white cliffs on west side of Granger Mt. then down into left hand fork of Hobble at junction of Pole Heaven, & Bartholomew Canyon where car had been driven around to pick us up. — Harry Chandler and I left mother & Dad at open field at mouth of canyon that lies just west the conspicuous & prominent cliffs at turn of (Hobble) canyon where it takes on a N. E. trend. These cliffs can be seen when driving along main road and have bright red stain on sand below them. When at point just beyond where Days creek enters the main canyon can be seen the canyon we started our trip. It leads up the mountain side in a northerly direction.



ITINERARY



380501-64

The higher red & white sandstones dip down into Canyon from both sides and forms a gentle syncline extending from the western edge of Granger mountain to a point ~~several~~ about 2 miles to the east. This Canyon lies in the apex of this structural syncline. The southern extension of this birdseye capping is traceable on right side of right Hand Fork of Hobble and caps a small mountain with the resistant birdeye forming cliffs around its nearly entire circumference. Leaving mouth of Canyon at about 4:00 we relized that our trip must necessarily be a rushed one for the high ridge of Granger mt. towered in the west with the sun nearing its horizon. Our objective was to collect information on the golden Eagle that we had been observing for the last 4 weeks. Our goal was to examine the cliffs that were situated just over the top of Granger mt. along the west apose. met several cattle at mouth of Canyon and trails beyond indicated that many cattle must have worked on beyond for the new trails were fairly well developed. A short distance up Canyon we came upon a fork with two canyons leading into the canyon we were travelling. A middle dividing ridge separated the two canyons and since the water was coming from the right fork we assumed that this one would be our best bet. Just beyond the forks we found two small deer in bottom of gulch that had evidently been killed by coyotes. While very few bones remained we found the hoofs & two complete pelvic bones to indicate size and number. The water supply increased as we left the lower portions of the canyon and at about 1/4 way up water course, would say, that the water flow would fill a gallon bucket in ~~about~~ 3 seconds. The flowers that grew about the edges were immaturely developed and were just on way in their spring growth. A little beyond the half way mark along the water course we found our first cottonwoods. The most noticable feature from this point on was the percentage of trees that were dead & had fallen over. After passing through the maze of fallen trees we soon observed signs of travertin in and along creek bed. We were now above the nonconformity of the lower Permian sandstone beds (3,) and the upper horizontal conglomerates, birdeye series. Possibly a few or say, a hundred feet above the the massive birdeye formation that so conspicuously outcrops near edge of canyon further to the south. While we were several hundred feet above the massive conglomerate outcropping as seen from road in bottom of left Hand fork of Hobble Creek, it can be explainable by the fact that from here the beds dip to the south where prominent ledge appears themselves on Canyon side. Our first real sign of extensive spring travertin was below point where spring issued from rock. The main source of water originates from apparently one single outlet on the west hillside about 30' up from gully floor. (no travertin associated with it) The entrance of the spring is small enough and concentrated in area that an ordinary dashog could have sealed it runoff. After the water leaves this outlet it falls over a steep set of small cliffs that are situated at canyon floor level. The only evidence of permancy was the great amount of green brush that surrounded it for 20 feet each direction. The small trickle of water in main canyon above point of canyon where where main water supply from the spring issued into canyon, soon ~~lost itself in~~ ended. Beyond which we found no

more signs of permanent water. Leaving the spring we proceeded up canyon and after leaving the larger trees behind found ourselves at the beginning of a fairly mature and gently graded, wide developed canyon. The dominant vegetation on the bottom flats was sagebrush, rabbitbrush, (?) and chokecherry. Bank callambola covered the ground at one point exposed was well developed and extensive in flatter portion of canyon floor. The west side hill supported large oak, maple and a few aspen while the east side represented a dryer situation with small oak & a few maple predominating. Would estimate that possible 15 green tailed towhee were found in this sagebrush growth in bottom of canyon generally in 2s 3s or 4's chasing one another or feeding. Also the spurred towhee was found feeding & singing but ~~of~~ in fewer numbers than the g. tailed. Apparently 20 white-crowned sparrows, favored this area. One noticeable thing observed when first arriving upon this more mature canyon floor was the numerous birds in evidence. The steep and steep sided canyon we had just left behind was quite devoid of bird life except a small flock of L. T. Chickadees, pair of Gray Headed Juncos, R. Shafted flicker & two sparrow hawks. This canyon extends in a N. Westerly direction and finally receives two forks. From this point to look back down canyon one sees only the maturely developed canyon and maturely developed canyon on other side of the left hand fork of Hobble. The entire surface appeared to be continuous and no one would dream that such a canyon as Hobble Creek would occur between. Hobble Creek canyon proper no doubt reprents a recent & youthful stage of erosion. From these forks we chose the left hand one and proceeded due west to crest of ridge. One way up this canyon we observed again the abundant fallen trees (aspen) being uprooted and all lying in same direction down canyon. The Claytonia, Dogtooth violet, yellow bells & Mertensia were all fairly well along in their development. Only one or two patches of snow remained on the east crest of ridge. Two deer were seen in the hillside of the right hand fork we had just passed. When on top of ridge we beheld a sight that was most impressive. The most impressive view ~~from~~ was to the west. Undoubtedly because of the great depth that suddenly presented itself on our arrival at the brink of the ridge. Far below one could see the green cultivated fields of the ranches conforming mainly to the valley floor and adjacent deltas of the canyons that entered from the sides. At the mouth of Bartholomew Canyon which was directly below us one could see 5 or 6 ~~distinct~~ successive deltas rising in step like style from the present creek bed west to where mountain rises abruptly. These delta like promineces parallel the present creek

bed and probably represent the partions of the older creek
channels. 3805017766 . The cross-section
of the canyon would seem to indicate that each extremely wet
cycle since the late pleistocene has taken effect and with the
added water supply has, by its meandering & lateral cutting
produced another creek bed level leaving the delta like
topography on the side. If the entire canyon is a glacial filled
canyon why should the erosion be progressively to the east. The
steep east side of the left hand fork of Hobble near the
junction of Bartholomew & Pole Heaven is no doubt due to the
persistent crowding of the creek to the east by the old
pleistocene glaciers & their terminal accumulations. Also the
rock strata dip strongly to the east and therefore the east
side of Hobble and the west side of Granger Mountain
would be more succeptible to erosion than would the
west side of Hobble in this particular area. From our
vantage point could also see that a glacier could readily made
the turn at the point where the left Hand fork of Hobble Cr. enters
the main Canyon of Hobble. North of Bartholomew Canyon the
topography takes on a little different appearance. The
slope eastward from the main mountain is quite uniform
representing a large area with few major canyons. The
towering & majestic peaks make a very unique ski-line
for the evening atmosphere; the sun just setting behind
them. Being at this point could see straight up Pole Heaven
and get good view of Snow Slide Canyon. Snow still covered
practically the entire west rouge. Following the ski-line
east from Grays Peak could see the divide of South Fork
and Hobble and a portion of the northerly extension of the
Wallsburg Ridge. Continuing east could follow ridges
leading over to Twin Peaks & the Strawberry Ridge and
the entire crest leading south to about a junction opposite
West Portal. Beyond could see the high mountains east
of the head of Indian Creek & N. E of head of Sheep Creek.
South of our junction loomed Mapleton Mountain and
ridges leading east that divid Hobble & Deamond. The
long Strawberry Ridge with its relatively even lined
crest appeared to offer an unusual interest summer trip
with pack on back. One interesting observation was
that nearly all the ridges between Ind & Strawberry Ridge
were at about the same level indicating a peneplanation
at that heighth at one time. The ridge just west of
Dry Canyon is certainly a conspicuous and exam side affair.
Could not see Uintah mts from here. Leaving this
point we traversed the entire length of ridge to the south &
investigated the cliffs that we supposed that might
support the new eagle nest but nothing of sufficient heighth
to even offer a site for a red-tail. Frightened one
deer at this point. About one half way down this
ridge we left the horizontal red & white sandstones &
runs into the old Permian(?) tilted beds. Saw what appeared

to be a Savannah Sparrow along ridge but doubtful as to identy. With the lights gradually fadding we hurried back along same trail to point where we first approach ridge, then north along edge of ridge to the large red & white cliffs, the only cliffs of sufficient heighth to support a eagle nest: All cliff south of this point were examined but nothing favorable for use as a nesting site. Seen are Dusky grouse along ridge. From these large cliffs we started straight down hillside keeping on north sidehill out of the oak bush that hung lower down. Caued see large star before our ascent and before arriving at mouth of gulch were well enveloped in darkness except for moon light that cast their shadow upon the ground. At the very mouth of this gulch ends with a 30' or 40' cliff and I suppose if we if we had not stayed to the north side of canyon would probably have been endangered by attempting to find our way out of the bottom of the canyon. This hill side that we made our descent is about the best way of getting down off this mountain on this side. Got drink at Bathalomews spring. Then divided, Harry going down canyon & myself up canyon in search of Dad & mother who were to meet us at this point.

5/4/38. The Say Phoebe has been seen the last two day around home.

5/5/38. Left home at 2:25 for pastures south of town. Followed south on University avenue to a point about 2 blocks south of First County Fair building, then walked S. W. and intercepted the lowest point on south on fifth sweet. Arrived at this observation station at 3:25 one hour after leaving home. From this point caued see the ducks just south about 300 feet at end of canal which flows into the open water bordering the main rush growth. The mill race course lie just south of this open water. As the field east of this station, when upon making my approach saw two curlew feeding in the more damp and water saturated grasses bordering a small stream. About 1 hour later these birds flew over station & flew south. Nine pheasants, feeding in open field, soon took to the weeds for concealment. Three mallards flew up from short grasses flew around several times and lit again in same vicinity. These three ducks, two ♂ and one ♀ were seen to be favoring this same area the entire stay at station. The female seemed to take the lead in the air and ground tactics. In the air the three would fly around the field recognizing one another at certain times. Slowly and deliberately they continued this playful maneuvering and upon lighting the ♀ took the first step to lead the two males. She would always take the lead in the ground pursuits and feeding. Whenever she flew from ground the two ♂'s would

be right after her. These tactics were carried on the entire time I was at the station. From the permanent observation post watched the action of the duck etc. A large falcon - probably the duck hawk had been feeding & resting near the mouth of the canal and on my approach flew north & out of site. The duck at end of canal were resting upon the water but occasionally taking time to feed. The mallards chase the small object in water to rest upon being entirely out of the water. Facing the slight wind they remained motionless with head resting upon breast with bill facing in front. A few mallards, mainly males were also resting upon the water but with feet probably touching the bottom of the flooded edge of pasture. Occasionally the mallards would preen primary feathers, tail feathers, breast feathers and head feathers by rubbing upon wing & tail. The Red heads and one1 also faced the wind and instead of resting head, or breast would generally be found to be placed in feathers of back. Before leaving the area they would swim to one side of pond, as if recognizing & anticipating the lack of space to rise off water, and with necks extended with an accompanying node would start their take-off. One redhead left pond at 3:35, one arrived 3:49, one left 4:20, one left 5:17. One female redhead was seen to be resting upon an object entirely out of water. One pair of pintails remained motionless at pond where canal water enters pond. The Cinnamon teal were a little more active and rested upon the water or on the bank. One pair left at 4:12, one 4:35 and one arrived at 4:36. One pair of Spoonbills feeding near pond walked over inundated grasses and weeds and then flew west about 100 feet to alight and continue to feed. A few Gadwalls were mixed in with others and were concerned more with feeding than resting. A pair left at 3:46. Baldpates joined in with the rest in their resting & occasional feeding. The most active bird in this congregation was the mud hen. When not chasing either the mallard, redhead or gadwall was seen feeding in grasses bordering water edge. The Am Coot is the most aggressive bird in the lot. Was seen to take possession of one of the mallards resting station and seen to chase practically every duck congregated at this point. When upon the water ~~coots~~ would extend neck horizontal and with neck & head fairly gliding upon the surface would swim toward its intended victim. When putting across the water would keep neck & head about 45° from the horizontal . The same procedure would be

followed upon the graund. The degree of malestation of the ducks is probably accentuated at this time of year when the mating instinct governs their action. Would not only chase other ducks but their own species. Practically the entire time was spent either upon the water swimming and feeding about or walking about in the grass, ~~some feeding~~ a greater number probably feeding in grass. One particularly thing noticed about these ducks when resting was the fact that they all faced the wind. There seemed to be periods when practically all the ducks were resting & then periods when a greater number would commence to feed or swim about. The change of wind, or the occurrance of a cloud shadows did not seem to produce any change in these different periods. However one thing was noticeable and that was any sound that was not ordinary would get a reaction from the ducks. The most noticeable noise was produced by a motor tractor in the field to the north about 3 blocks away. The constant turning of the plow & tractors produced several grades & degree of noise but did not effect the ducks in an apparent way. However when a wagon crossed a bridge the duck responded with high stretched necks. Even the flight of a marsh overhead or the passing of a low flying duck or even the arrival of a ducks did not make the resting nervous. When ready to leave the station walked directly toward them. The first duck to leave was a lone mallard, then about 40 seconds later another mallard left then a lone gadwall and then the entire flock, of about 20 rose. Two pintails remained and stayed until about 30" later when my progressive invasion of their resting ground was just a little to much for their personal safety.

Other birds seen at this station was the great blue heron. In the distance could see the herons frequently pass in field of glasses winging their way from west to east and east to west. Two were seen flying very near edge of rushes just beyond pond and alighting somewhere in rushes probably bordering mill race. Follow a few of these birds with glasses found them to be alighting in rushes about S. W from here, however, would not be sure that it represented their rookery for I was just a little below the horizonal level of the rushes to see whether they were all alighting at same area. The Brewster & Black Crown night heron were seen flying by. General Marsh Hawks paroled the rushes & field and were not without the continual & persistent harassing of the red wing blackbirds. Generally when over the territorial site

of the blackbird the male bird would chase hawk for a hundred feet or so & then return. The marsh hawk has evidently adjusted to these darting attacks but would occasionally defend itself and utter its own warning call. One hawk was seen to be carring a fish as it left from field to the west and fly south & east for out over the rush mass to alight about a mile from starting point. The tule wrens were relatively quete until I made my last approach on the resting duck whereupon they all started to chatter & make themselves known. They have a parcelian flight at this time of year. They fly a short distance as in descending look much like a humming bird alighting with its rapidly beating wings. A flock of C. Geese (7 in number) past but at 5:45 following along the ~~eastern~~ northern edge of the Arano Bay rushes. Heard several others in flocks. One pelican flew by in review during first part of stay & returned by same course about 1 and ½ hrs later. May & may not have been same bird. To see this bird ~~fly by with its~~ cruising by in such a dignfied manner and with the accompanying sweeping of wings felt that the world would certainly be a less romantic & picturesque place to life in. At about 5:00 a flock of 32 Ibis flew into field of binocular slowly & deliberately inspecting the vicinity directly below them. They continued their 32 abreast formation wheeling from one side to the other and about 50 above rushes. When about in the vicinity of the first ward pasture where the mill race begins its course from open pasture lands to rush area the ibis began to rise in elevation. They had evidently been following the course of the mill race stream until the reached a point where the rushes left off. They circled straight up into air in wide right hand spirals. Higher & higher the circled and gradually deviating to the south until possibly over a line between steel plant & my station. After a change from a right hand circle to a few left hand circles they all fixed wings & soared in a S. W. direction. Gaining more and more speed in their prolonged downward drive they soon were at a point just south of station. Wheeling to the left they gradually descended to rushes alighting in an area which would seem to me to be in the Sprngville pastures near mouth of Hobble Creek.

Three R.F Glossy Ibis fed in field to west. Occasionally they would elebate their wings above back as if in the act of drying or for the purpose of dissemmating bodily heat. The Short eared owl was seen several times flying about in adjacent pastures. It seemed to favor a certain weed association and very likely has a mate on nest. The R.N. Pheasants seen feeding in adjoining field seemed to 'take their time' and continually fed at one point for 5 minutes. The day was either to chilly to set without a sweater when clouds shaded the ground ore to warm to set directly in sun. A slight wind continued during the entire stay at station and had enough velocity to send a blade of green grass, one foot leeward when held 1' high

5/4/38 Young Robin left nest today and remained in locust tree. near home.

5/11/38

Stationed on west exposure of Pimpanogos mt.; Thursday evening through to Saturday evening with the objective of recording daily trend and fluctuations of bird and animal activity. Conducted daily complete censes of certain definite and limited areas and selective observations of general extent. Area under consideration conforming to west exposure of secondary range, bordering Utah valley on the west and forming the foothills, so to speak, of the majestic and towering Pimpdunogos, rising abruptly to the North-east. Confined limits to the intervening mountain slope between Battle Creek Canyon and Dry Co. Canyon, on a nearly horizontal level at a heighth short of half the elevation between valley floor proper and top of Big Baldy. The unusual topographical expression of this area, no doubt, influences the range + local distribution of the birds & mammals. The regular and flat valleys, parallel transversally the entire mt. side in a step-like manner and are originally, apparently due to differential erosion of strata on North-east dipping limbs of anticline which forms this secondary range. The south east dipping apis of this anticline carries through from the heighest point on south side of Battle Creek to the largest and most conspicuous set of cliffs in Dry. Canyon. Both these Canyons show this structural anticline in cross section. The entire length along the apis of this anticline constitutes the area under consideration.

380511-72



Position of trail to top of Timpanagos indicated on photo.

photo taken 1-5-12-38 ↑ (see 10:38 of 5/12/38)

Left Home 5.55 p.m. with outfit and food for seven meals.
Arrived at lower point of alluvium of Dry Canyon 6:23. P.M, harnessed pack on back & soon on trail. Distination; the spring below Big Baldy on South west exposure.

Complete Census

6:25 Mourning Dove flew west across alluvium about 30' high.
6:25 Heard R.N. Pheasant call & drum, meadowlarks singing (2)
6:28 Dove flew east across alluvium & lit in draw.
6:29 Pheasant crowed, drummed on hillside to east.
6:30 Two pheasants crowed & drummed to west. One half minute later 2 more crowed & drummed.
6:31 Towhee singing. (Squaw bush with yellow flower clusters, rudementary leaves only curled and without form, could see right through 20' patch.
6:32 2 R.N pheasants calling
6:34 Two mourning doves flew up in front from ground.
6:34 Two more doves flying up canyon together.
6:34 Magpie flew by.
6:34 Pheasant called.
6:34 Towhee stopped singing. (heard 6:31)
6:35 Mourning dove cooing
6:36 Pheasant calling (2)
6:36 " "
6:36 Magpie calling
6:36 Colorado Jack left draw and ran 200 feet to edge of first oaks, stopped for 1 minute and then disappeared.
6:38 4 Calif Quail flushed. Offered call (warning)
6:39. Towhee singing again.
6:42 Pheasant calling
6:40-45. Estimated 250 chipping sparrows, some singing in oaks others feeding in stork hills and short grass on shaded side of small slope near creek bed. Those feeding on ground flew to oaks.
6:45 Quail calling
6:46 Two pheasants warning at two different areas simultaneously.
6:46 Left chipping sparrows behind and calls now changing from a chirp to a song.
6:48. Magpie & Quail calling
6:50 Magpie left nest at 40'. nest 5' high in center of oak patch. nest delapidated. 4 young birds without feathers.
Oak leaves 3/4 inch long but still deformed & curled.
6:55 Pheasants still calling.
6:55 Can hear mourning dove cooing on ridge to left of dry canyon.
6:56 Spurred Towhee feeding in oaks on ground.
6:58 Red Tail (?) soaring above Dry Canyon
7:00 Arrived at mouth of Dry Canyon proper. Three mourning doves flew up from ground one attempting to light in one of three cottonwoods at mouth, then flew up hillside. Redtail hawk screamed for first time from his lookout on first prominent cliffs on ~~left~~ right side of canyon; setting on oak shaded cliff.
7:00 Started up ridge to left bordering Dry Canyon. Red tail screamed

TRAIL TO TOP OF MT.
GROWTH LINE OF MAPLE

7:49 Humming bird flew east calling
7:52 30 chipping Sparrows in short Chet grass and stork bills on open and exposed hillside. Characters not discernable beyond 30' because of darkness coming on.
7:55 Doves flew by (2)
7:00 Spurred Towhees still singing. Mourning Doves have stopped Pheasant calls decreasing. Just as I was approaching more level portion of flat below spring heard ♂ pheasant warning vigorously kept up its single, double & triddle ~~call~~ noted call. As I walked toward ♂ would move on up hill. On brink flushed five ♀. ♂ offered ten rapid warning calls in succession. Passed on by and ♂ kept calling for 5 minutes.
8:05 Late twilight and can not read pencil ~~writting~~ more than one foot away.
8:13 Arrived at camping spot about 150' N.E. of spring and at base of escarpment. Heard pheasants calling. Spurred Towhees quite now.
8:30 Heard weird call of (?) coming from base of Big Baldy. The note was about middle C. The first note was about 1 second long in duration the next note 1/2 step higher and following immediately after first note and about 1/2 sec. duration.
8:54 Camp set, tent up, sleeping bag arranged and water boiling. Prepared lunch always desirable for first meal and with a warm drink will suffice and certainly save time which should be used for camping making. Never light fire until camp is set up, unless for lighting purposes. Practically no wind and deadly silent except for weird call on big Baldy
9:01 Heard weird call.
9:04 Heard noise in oak leaves 150' east of camp on escarpment, then followed by weird call just over crest in same vicinity. The call now, at this distance had a third not attacked that could only be heard at close range. It was merely an ex-pelation of nonchalant sounds much lower than two main notes.
9:05 300' S.E heard weird call. Kept up for 4 minutes then stopped.
9:20 Heard weird call toward upper cliffs in Dry Canyon. First weird call since 9:04. Weird noise from cliffs every minute, bird at base of Big Baldy about once every 5 minutes.
9:30 Bed. Left weird call still calling.

Next morning (5/12/38)

4:15 A.M. Spurred Towhee singing also pheasant calling
4:35 Pheasants calling 18 times per 2 minutes. One N.E of camp calling every two minutes.
5:45 'Its hard to get up on the morning'
5:47. Started breakfast
6:35. Ready to leave camp. Objective to make complete census of bird & animal life from spring to highest point on south side of Battle Creek and return, following along trail that conforms to flat valley following along pitch of anticline. Did not deviate from trail except at one or two places in which case it did not exceed 180' to either side, occasionally stepped to brink to look down into valley to the west & south. No duplications of numbers unless indicated, will therefore represent entire number of birds & animal seen or heard. Followed same course on return trip.
6:38 Mourning dove cooing up trail. (Complete Census.)

9:00 Road-cause Jays (2) [illegible] fussing from oak to oak at left and calling.
9:04 Virginia Warbler worked up through limbs of oak to uppermost branch and warbled, then flew to another tree & warbled. In working in branches held mantle open. Another Warbler was working in branches below.
9:06 Slight wind, can hear wind blowing on top of Big Baldy.
9:07 2 Spurred Towhees singing on escapment to right.
9:08 Mourning Dove calling to north.
9:09 Virginia Warbler warbling to right
9:09 Spurred Towhee singing in oak top, left on approach and flew directly down into base of trees.
9:10 Wind increasing. Clear skies overhead.
9:16 Lone Pine Siskin flew overhead calling; flying to the north.
9:17 Virginia Warbler singing in top of oak to right; flew across trail to top of another oak & continued to warble.
9:21 One Chipping Sparrow singing (burst like) in oak. 19 more feeding in oak and on ground below. When approached they flew in several directions offering their plaintive & mild chirp. The Chirp of the Chippy is much more plaintive than the sharp, pronounced chirp of Virginia Warbler.
9:25 Can hear one Chickadee two note call.
9:26 Two Spurred Towhees on either side of trail scolding.
9:27 Grosbeak still calling behind.
9:28 Two Towhees singing, one on escarpment the other on bank of hill.
9:29 " Virginia Warblers singing on escarpment to right.
9:32 Two White Throated Swifts flying along escarpment to the S. E.
9:33 Spurred Towhee scolding near trail to right.
9:34 Leaving the head of the 2nd Valley and starting around left edge on trail to divide looking down into Battle Creek drainage. Last Cedar Covered ridge beyond divide.
9:35 Horned Toad in trail on west exposure. Four inches long and moved rapidly into dry leaves under oak trees.
9:36 Heard Swifts ahead.
9:38 Now on divide. Wind stronger.
9:39 Coopers Hawk flying irregularly over oaks to right below
Two Towhees singing & 3 Virginia Warblers warbling to right below.
9:42 2 swifts flew over divide.
9:45 2 Virginia Warblers, one of them in top of oak and one in lower
Branches moving from one limb to the other.
9:45 Spurred Towhee scolding on divide.
9:46 Virg. Warb. Warbling in oak to left
Mertensia well developed on divide. Oaks still with curled leaves about 1/4 inch long, still holding bud shape. These oak are not as well developed as those at spring. No strong wind now, but can hear wind on top of Baldy. Very Warm. Skies clear. Bambyliids increasing, two sings.
9:52 Virg. Warb. in Mahogany chirping
9:45 Now looking down into Ute Valley and can see Pleasant Grove and mouth of Battle Creek. Top of Mahogany ridge
9:55 Hear & see swifts to north.
9:56 At Destination and looking straight down into Battle Creek below.
9:57 Northern Violet Green Swallows just below and near highest point.
10:02 N. V. G. Swallow still favoring the immediate space just north of highest cliffs. Two Swifts flying together always in evidence flying from bottom to top of canyon. Observed one to preen feathers of

again for second time.
7:01 Leaving quail behind, their scalding calls changing to one of nomal call.
7:02 Red Tail screamed twice.
7:02 Spurred Towhee, quail and doves still calling.
7:04 Red Tail screamed from same perch.
7:05 " " " " " " twice.
7:06 " " " " " " "
7:07 " " " " " " "
7:07.5 Left perch and flew across canyon to investigate, screamed and then sailed back to perch.
7:08.5 Screemed again. and again.
7:09 Red Tail left tree perch, came across canyon screamed and then flew up canyon around cliff on left side of canyon and out of site.
7:11 Pheasants, quail, doves calling on usual frequency. Towhees every 4 seconds, quail every 5 seconds, pheasants every 10 seconds, mourning doves every 5 sec.
7:14 as I approached top of first set of cliffs on left side of canyon heard chipmunks calling
7:15 Arrived at first ledge. Red-tail came from somewhere, circled twice over head and ~~to~~ without calling flew to point of 2nd ledge ~~at~~ up canyon and screamed.
7:17 Two mourning doves left the 2nd set of prominent cliffs. The third set of cliff could be seen further up canyon.
7:19 Red-tail soaring overhead occasionally calling
7:19 Approx 80 northern Violet Green Swallows (?) flying in mass over canyon valleyward, Kept mass identity and circled higher and higher toward the south until lost from vision. Slight wind for first time. While setting on ledge a mourning dove lit 30' away on point, stayed about 1 minute then flew upcanyon
7:27 Red tail lit on cliffrose on second cliffs and screamed.
7:32 Second mourning dove lit on ledge where dove had just left. Vandly facing south. A lined area about 8 or 10 feet from nest to north had evidently been used as roost.
7:25 ♂ Redtail still fussing & calling on second ridge.
7:26 R. Tail left second ridge, flew across canyon & lit in oak on top of nesting cliff; screamed.
7:27 R. Tail screamed from ~~seems~~ perch above nest.
7:29 Two doves flew by nest of redtail.
7:30 Spurred Towhee, quail and pheasants still calling.
7:31. Sun just dropped behind Oquirrh mts in distant horizon
7:32. Arrived on second set of cliffs
7:32 Red. Tail still on old perch on oak above nesting ledge, calling
7:33 While sitting on second cliffs observed four deer feeding 100' above canyon floor on east hillside that was framed by the highest and most prominent cliffs to the north. Feeding on low shrubs, one pawed dirt but did not reach down with head to investigate. Had evedently been feeding in shadows before sun went down.
7:35 Moon (full) appeared interlucent on east ridge for first time
Two towhees calling on east side of canyon. Slight wind from the west.
7:40 Pheasant, quail, and Towhees still calling.
7:40 Humming bird flew across canyon from N.E to S.E calling.
Skies in west horizon red and clouds stratified.
7:45 Stronger wind down canyon
7:45 Spurred Towhee, pheasant still calling, quail stopped calling
7:46 Four deer had moved up hillside 80'
7:47 Leaving ridge of canyon and turning left to gain flat portion of mountain side valley. Wind still blowing in canyon, Towhee singing on bottom.

6:38 very slight breeze hardly noticeable however, sun not on trail near spring. Skies clear except a few in east above mts. Bright and withuit mist in distance.
6:42 Green Tail Towhee left trail near spring. One heard below.
6:44. Sun beyond on trail 100' west of spring
6:48 Mourning dove flew from spring vicinity.
6:48 Heard Woodhouse Jays calling.
6:34 Spurred Towhee scratching in oak leaves, scolding.
6:55 Two Long Tailed Chickadees approached me in oak stand. One investigated 2' from my head while the other one worked up to top branch of oak and began to call. Its call was two syllable one note 1½ step below fast note. Another Chickadee called 160' away. After talking back & forth the bird flew down to one concerned about my presence and both feed away.
7:00 Pheasants & mourning doves calling regularly.
oak with curled and immature in shape 1½ long & less
7:01 Flycatcher (? sp.)
7:04 Spurred Towhee singing N. E of spring.
7:05 Two Woodhouse Jays west of spring.
7:05 Mourning Dove Calling in direction of Big Baldy.
7:06 Two deer on escarpment below Big Baldy feeding up hill
7:07 Flycatcher (? sp.)
7:08 Two Mourning Doves flew by.
7:09. Towhee Calling. (singing)
7:10 Two pheasants calling from escarpment below Big Baldy.
7:14 Leaving head of spring with two Virginias. Warblers continually chirping in tree tops (oaks) Rather difficult to approach.
7:15 2 Spurred Towhees feeding together N. W of spring.
7:16 Pheasants still calling to north. The larger stands of oak about 100' west along trail are further along in foliage than the small oak.
7:19 Two Chickadees calling back and forth beyond. 1½ step drop.
7:20 Jay and pheasants calling.
7:21 Towhee on escarpment 100' N. singing
7:24 Black Headed Grosbeak singing vigorously 100' west over brink in oak. Sun not yet on bird.
7:24 Heard Spurred Towhee singing on flat far below to left.
7:25 Spurred Towhee singing walk on escarpment.
7:26 Hummer passed N. W ~~singing~~ calling
7:27 Two Magpies calling on flat far below.
7:28 " Spurred Towhee ~~singing~~ scolding just below brink on south side of valley.
7:28 Spurred Towhee singing 40' west of Grosbeak.
7:31 Humming bird passing N. W along valley, calling.
7.31 The Grosbeak heard (7:24) has moved up over escarpment and now singing on top of hill to the north.
7:31 Catbird - tail 150' over top of brink in west exposure in shadow.
7:38 now starting up more valley shaped portion of flat (Beginning of valley No. 1)
7:39 Pheasant still calling & drumming
7:40 Two Chipping Sparrows singing in oak top to left.
7:41. Grosbeak still singing behind
7:46. Heard Humming bird in air.
7:50 Frightened Chipping Sparrow from sagebrush & dry grass into oak, where he proceeded to sing his locust song.
7:51 Virginia Warbler in oak neither singing, chirping or fussing. merely resting
7:51 Virginia Warbler warbling to N.E.
7:52 Virginia Warbler warbling to S.E. The warble of the Virginia is more of a warbling song than the Chipping Sparrow and ending slightly different.
7:54. Virginia Warbler fussing & chirping in oak
7:55 Sp Towhee scolding to the N.E
7:58 Grosbeak of (7:24) still singing.
8:01 Virginia Warbler 100' over brink to south singing in oak top
8:02 Sp. Towhee sing to right from top of oak.

380512-76

8:02 Two Virginia warblers singing in oak tops to right upon escarpment.
8:06. Swainson Hawk resting upon top of small oak on brink of valley to left. Flew when approached within 130'. Flew over edge & out of site.
6:08. Spurred Towhee to right singing.
6:10 Heard Hummming bird flying by.
8:11 Heard Virginia Warbler to left of trail.
8:12 " " " " " singing left.
8:14 " " " " "

back while still in the air
10:06 Sparrow Hawk circling near mouth of Canyon below.
10:10 Leaving point to work down east ridge of Battle Cr. to a point where I can see the Battle Creek drainage more advantageously. Numerous deer tracks in Mahogany along edge of ridge. Towhee singing to the east.
10:14 Mahogany seem to be concentrated at very edge of cliffs.
10:15 Arrived at station where the Canyon + upper drainage are both plainly represented.

Stations. (400' down N.E ridge bordering south side of Battle Cr.)

10:20 Can hear falls below in Canyon
10:21. Seven more Swifts appear upon the scene.
10:22 Hear the single grunt of the Dusky Grouse (?) near Big Baldy
10:26. Hummming bird passed.
10:27 Towhee singing to S.E.
10:30 Every time a swift passes six feet overhead at 60 per, catch myself reacting with a slight jump. A jump with more than a slight degree would also place me 300 feet below in short order.
10:30 Heard seven shots toward the divide just to the south.
10:38 Counted 8 swifts at one time. To the east, the demarkation between the lower maple which had slight greenish cast and the maple further up the face of Pimp still in colorless hue conformed to the bottom of the first noticeable escarpment where below the valley is less step + beyond rises abruptly. This picture taken to show the degree in which the western exposed snows have suffered will also show the line of the new + dormant maple foliage. Also the trail leading up to the glass house on top of Pimp. can be plainly seen. (Picture ON First page OF 5/11/38)
10:50 Dark cloud shadow two minutes to come from south rims of Grave Creek Canyon across upper drainage of Battle Cr Canyon to bottom of Canyon.
10:51 R.S. Flicker calling in Canyon floor directly below.
10:55 Heard Hummer.
10:56 Swallows still flying in Canyon but keeping mainly on south side, near top and just opposite high cliffs. They frequently come east to station.
11:00 Heard Hummingbird.
11:00 Praire Falcon flying up canyon to a point above falls + about the 1/2 level mark in altitude. circled and called once then flew west to mouth of canyon, circled several times gaining altitude calling once then flew south, east. Could not tell whether or not he lit in cliff near front of canyon or continued to fly south along face of range.
11:05 Heard Hummer
11:25 20 swifts presented themselves in aereal dogfight below.
11:26 Heard Hummer and cry of Sparrow Hawk below
11:26 Two magpies talking to one another to my right.
11:26 Utah Jay lit in top of dead fir below in canyon. Preened feathers then flew from one dead fir to the others. Seemed to pick out the dead timber in the stand of fir.
11:28. Falcon lit in cliff 200 feet west + when I presented more than my head he became greatly concerned, screaming continuously for one minute then came over to investigate, circled once + kept screaming then flew across canyon until I lost track of him. Returned two minutes later screaming + circled around on same level + above with head turned toward me. Then flew out of canyon to the west. Again could not tell whether he lit in cliffs or flew down south along west exposure.
11:34 Falcon returned screaming + faboring top of cliffs to the west + ~~left~~ on southside of canyon.
11:34. Utah Jay below cliffs in white fir

11:40 Wind still blowing up canyon but warm on lee side of cliff.
11:40 Another Mlak Jay arrived in fir below
Heard Hummer
11:42 Jays nervous below flying from one tree to another.
11:45 Left station with the swifts still maneuvering about and calling continuously. Swallows still commanding the front part of Can.
11:45 Jays left when Sparrow Hawk lit in stead of fir below. Jays scolding and the Hawk screaming.
Heard Hummer.
11:46 This station is an excellent vantage point for observations both up canyon in upper drainage & canyon proper.
11:55 On top again at highest point looking into Canyon & valley below
12:00 While standing on edge saw falcon leave tree roost on north side of smaller ledge about 150' down west ridge of Cattle Creek. It flew up and circled overhead crying continuously. Investigated falcon roosts, two near each other on side of cliff then examined two likely nesting sites on main cliff below point. One is in a fracture 20' high about 120' east from perches a highly coated with excrement and one a little nearer lookout perch, being a small recess with overhanging ledge. The falcon screamed continuously from time I arrived until leaving. Particularly concerned when near nesting sites and would dive at these points. Did not see eggs or young but am satisfied that by the actions of the birds a nest is certain near at hand.
12:20 Leaving top & falcons behind.
12:21 Two Cotton tails on west exposure in thinly covered rocky sidehill not more than 120' from falcon perch.
12:22 300 feet south of rim found campsite having been used this spring.
12:23 Leaving ridge and working down to divide. Towhee scolding to left.
1224 Pheasant calling
1226 Spurred Towhee calling & singing on north one scolding on south.
12:27. Atmospheric thundering beginning, sounding like some distant blasting.
12:28. On divide
1229. Coopers Hawk flew over divide behind me 40' and flew 200' down south trending canyon out of site.
12:30 Virginia Warbler singing 50' to left in oak, on approach flew 30' to another oak, worked up to top branches and started singing.
12.30 Virginia Warbler singing to the south, approached, passed & left still singing
12:33 Two Virginias warbling to east 400'. Two Clipping Sparrows singing in locust manner.
12:36 Leaving Divide
12:38 Worked around edge and now at head of 2nd Valley. Wind blowing in greater velocity, Skies clear.
12:39 One Virginia Warbler warbling and one Clipping Sparrow singing locust style to left.
1242 Hummer passed N.W along mountain escarpment.
1242 sp. Towhee scolding to left in oak
1243 Two mourning doves left ground and were loath to leave vicinity flying from one tree top to the other. Heard distant call of mourning dove.
1245 Virginia Warbler ~~warbling~~ chirping in oak & feeding at base of trees 20 feet off trail to right.
12:46 Spurred Towhee singing on escarpment to left.

380512-80

12:47 Three Chipping Sparrows feeding on ground. Chirp mild and plaintive in contrast to Virginia's
12:48 Heard Hummer. Summer wind blowing.
12:51 Virginia Warbler warbling on escarpment to the left
1253 Two Spurred Towhees feeding together on dry grass & weeds at base of oaks. The oak stand was in a rather open clearing and when passing by they flew out and into near by oak, scolding.
1255 Virginia Warbler warbling on escarpment to left.
1255 Near mouth of 2nd Canyon on flat portion of valley the large oak are drapping to the S. W.
1256. Hummingbird flying to the east & calling
1256 Pheasant calling toward escarpment.
1257 2 Pheasant flush near trail & lit 100' beyond.
12:59 Two S. T. Towhee & 1 Spurred Towhee flew up from some weed & oak growth as pheasant was frightened from.
12:69 4 Audubon Warblers in oak stand to right of trail, feeding near top branches, Warning chip like Virginia warbler. The birds are more agile than Virginias a fluttering more when working in oak. Can approach them much closer than Virg but when pressed to close will fly in mixed.

1:00 Arrived at mouth of second valley where valley leaves its N. W. S. E trend & shoots abruptly down west exposure of range. Heard hummer & Woodhouse Jays.
Leaves blowing on ground but skies clear, day bright & warm.
1:06 Jay lit on edge of flat.
1:07 Pheasant calling, Virginia Warbler warbling
1:12 Virginia warbler chirping near trail, when approached within 30' flew to escarpment and continued chirping in oak.
1:12 Grosbeak singing back in Valley No 2.
1:13 Bright green beetle on trail (Tiger beetle)
1:13 Virginia warbler chirping on left, one singing 300' to left on escarpment.
1:15 Head of 1st Valley. House Wrens flew up from sage-brush into oak 10' away and scolded. Two minutes later it began feeding at base of oaks and its vigorous scold changed to one of a muffled scolds.
1:16 Spurred Towhee 20' down from wren, loath to leave with crest in air.
1:16 Virginia Warbler chirping
1:17 " " warbling on left escarpment.
1:18 Coopers Hawk (?) flying above through oak.
1:23 Hummingbird flying east along escarpment.
1:24 Two Virginia Warblers singing on escarpment top to left.
1:24 Spurred Towhee scolding on escarpment 300' to left.
1:28 " " " to right
1:29 Two Spurred Towhees scolding on escarpment 200' apart.
1:30 7 or 8 Chipping Sparrows feeding in ground. One chased the other through oak.
130 4 Towhee scolding 150' to escarpment. One Spurred Towhee feeding quietly and let me pass without objection.
131. Spurred Towhee scolding at base of tree 15' away.
135 One lone Audubon warbler feeding on top of oak.
1:36 End of 1st valley, Spurred Towhee singing 100 feet up on escarp. one 100 feet down hillside over brink of valley.
1:36 B. H. Grosbeak singing in same area as recorded this morning left tree on approach & disappeared.
1:37 Virginia warbler chirping 50' to south over brink.
Good deer bedding grounds 100' up first canyon on floor of valley.

1.42. Greentail towhee to leave trail six feet distance. Stopped to adjust note-book or would have missed another G. Tail feeding with three are quietly & unnoticed. Spurred Towhee stopped scratching to gain top of oak to sing. Flew to another tree 60' away & sang

1:45 Pheasant calling from flat below over edge of flat.. Wind still blowing but warm atmosphere.

1:46 Magpie warning on approach to spring. Pheasant calling 100 feet above spring. Two Virginia Warblers flew from area

1:47 Two Virginia warblers warbling & chirping

1:50 The Chokecherry 100' above spring had well developed leaves but seeds. + flower receptules in 2 inch lengths but no individual flowers as yet. Maple much more developed than oaks.

1:52 Arrived at spring.

1:53 Arrived at camp. Jack Rabbit left near camp and hopped quickly up over escarpment.

1:56. Hummer passing west, calling

2:00 Pheasant calling & drumming BOON-E

3:22 Dishes washed and leaving camp to make station over at dry canyon for selective recording, particularly change in songs & activity with the change in time of day

3:28 200' east of camp along escarpment saw 1 Virginia Warbler chirping at 20', chickadee silent and feeding, 1 Sp. Towhee scratching & calling

3:29 Pheasant drumming & calling N.E from camp

3:30. Virginia Warbler chirping to south.

3:31 Pheasant calling from same area as (3:39)

3:31 About 400+ feet E east of spring on ridge leading down to cliffs in Dry Canyon and at a point where one can see up Dry Canyon for first time after leaving camp is an area 190' by 200' is completely covered with wild onions. The area looks like a new grain field or lawn. The dying tips of the leaves are brown & yellow and give a yellow hue to a field that would otherwise be a beautiful green in contrast to the old and subdue colors of the immature oak. The area occurs on the ridge and is more or less flat. Between the individual plants the soil is dry & cracked but at one time, evidently was rather moist. The peculiar odor was very noticeable.



2-5-12-38

The field extended down hillside & ridge to the south for some distance.

3:33 Pheasant calling & drumming from same area as (3:39)

3:35 Several Towhees singing in Dry Canyon Drainage below Big Baldy.

3:45 Spurred Towhee scratching in leaves and did not leave or object when passing 20' away

3:35 Heard Steller's Jay.

4:00 Arrived at point of cliff in Dry Canyon to establish station for selective observations. The most easterly extension of upper cliffs looking down both & up



canyon. On arrival a cottontail ran from cliff base on ridge down to edge of cliffs. Two marmots, one running down rock slide directly below cliffs on west side of canyon. while one feeding on east side of canyon, not more than 100' from falcon nest. Pfanic falcon in evidence calling and diving

4:20 Flicker calling in bottom of canyon directly below.
4:30 Moved up hill to a point where could hear both sides of cliffs for songs.
4:50 Falcon left
5:10 The two red-tails lit upon oak above nesting cliffs ♂. One bird sailed down to nest the other flew across canyon and lit on cliffs opposite nesting cliffs.
5:55 Marmot calling for first + last time below.
6:00 Swifts varying from 2 to 6 in air at one time.
6:02 Falcon returned, flew around canyon not approaching nest except flying by after 10 minutes of sailing around canyon. He held a E. D. Utahensis in claws. Head first and tail streaming out behind.
6:14 Female came out of nest on cliff and flew after male. Male lit on side hill in dirt ♂ ♀ took chipmunk and flew to point on cliff. She carried the chipmunk in same manner as ♂. Could not see point of cliff because of ridge that intercepted the line of vision but soon one bird flew across canyon into nest with part of the chipmunk then the other flew across with entire animal and went into fracture where nest was situated. The first bird flew out on second birds arrival. He circled around + soon d lost ~~him~~ the site of his presence. Nest on east side of canyon ~~at~~ on face of high perpendicular cliff. At north end and upper limit of of this cliff is a perpendicular fracture the entire height of the cliff. The nest is 10' from top of cliff down this fracture in recess.
6:24 Rock squirrel on ledge below
6:37 Coopers appeared and sailed in spiral upward to the north.
6 50 Mourning doves beginning to fly around.
7:02 Marmot feeding on east side of canyon below + down canyon from falcon cliff.
7:06 Observed deer working down ridge on east side of Dry Canyon. just down ridge from prominent isolated cliff near top of ridge. evidently coming from east side of ridge.
7:17 4 deer working out from bedding ground a little north on a level on other side of canyon.
7:30 Deer that crossed ridge at (7:06) is now at water at bottom of canyon directly below from where he first came over ridge
7:35 Deer through drinking + now working back on hillside
7:37 The four deer are now feeding near point where observed yesterday evening.
7:40 Seven deer feeding on ridge opposite Big Baldy to the east. Two near the top of ridge and five near bottom of canyon near head of canyon
7:48 Left Station at 7:50.

From 4:15 to 7:30 from station as above kept separate record of the occurrance of the pheasant as to its distribution told by calling. The upper drainage below Big Baldy down to last conspicuous cliffs on Dry ~~and fuss~~ constituted the upper area while the foothills + valley up to this

point constituted the other area. The main objective to determine whether the upper region was as populated as the lower foothills. Recorded every call offered in these two areas. The calls were generally followed by drumming when heard close by but represented only the call when at a distance to great for the drumming to be heard.

Higher mountainous area.

4:15	5:15	5:47	6:34	7:16
16	16	48	34	17
19	16	48	35	18
21	16	49	36	18
22	16	49	37	19
22	17	50	37	19
22	17	50	38	20
23	18	51	38	21
23	19	52	39	21
25	19	52	39	21
28	19	52	40	21
27	19	52	41	22
30	20	53	42	23
31	22	53	42	23
32	23	54	42	24
33	23	55	43	24
40	23	56	44	24
41	24	56	44	24
42	24	57	45	25
43	25	57	45	25
44	26	58	46	25
45	26	58	46	25
46	26	59	47	25
47	27	6:00	48	26
47	27	01	49	26
48	27	02	50	27
48	27	02	50	28
49	27	03	51	28
50	28	03	51	27
51	28	04	51	24
51	28	04	51	29
51	29	05	51	29
51	29	05	52	29
52	30	06	53	30
52	30	06	54	
52	31	07	55	
52	31	08	55	
53	32	09	55	
53	32	10	55	
53	32	11	56	
54	32	12	56	
55	32	13	57	
55	34	14	58	
55	35	15	58	
56	35	16	59	
56	35	17	59	
57	35	17	59	
57	36	18	7:00	
57	36	18	02	
59	36	19	02	
59	37	20	03	
60	38	21	04	
5 01	38	21	05	
02	38	22	05	
03	39	23	06	
03	39	23	06	
03	40	23	06	
04	41	23	07	
04	41	24	07	
04	42	24	08	
05	42	25	08	
05	43	26	09	
06	43	27	09	
06	44	27	09	
07	44	28	10	
07	45	29	11	
07	46	29	12	
08	47	30	14	
09	47	31	15	
10 5:12	47	31	15	
11 5:12		32	16	
11 :14		33	14	
11 :14			14	
12 :14				
12 :15				

moved station 300' upridge

moved station 300' up ridge

total 334 calls in 3 hrs. 15 min

Valley & lower adjacent hills

4:15	24	15	13
:17	25	17	14
18	26	18	14
19	28	18	15
19	28	19	16
21	29	20	16
22	29	:21	16
22	29	23	14
24	30	24	16
25	31	25	17
26	31	25	17
27	32	25	19
28	32	26	17
29	32	27	18
30	33	30	19
30	33	31	19
31	33	31	20
40	34	31	21
41	34	31	21
41	34	31	21
42	34	32	22
43	34	32	22
44	36	34	23
44	36	34	23
45	37	35	24
47	38	36	24
47	38	36	24
49	40	37	25
49	41	37	26
49	43	38	26
50	43	39	27
51	44	39	28
51	45	40	28
51	46	42	29
51	46	42	29
52	47	42	29
52	48	43	30
53	48	43	
54	48	44	
55	49	44	
55	49	45	
56	50	46	
56	51	46	
57	51	47	
58	52	47	
59	52	48	
59	53	49	
5:00	55	49	
04	55	50	
08	55	51	
09	56	51	
10	57	52	
11	57	52	
11	6:00	53	
11	01	54	
12	02	54	
12	02	54	
13	03	55	
14	03	57	
14	04	58	
16	04	7:00	
16	04	02	
17	05	02	
17	05	02	
18	05	03	
18	06	04	
19	08	04	
19	09	06	
20	10	07	
23	12	07	
23	13	08	
24	14	10	
24	14		

moved station 300' up ridge

total 266 calls in 3 hrs 15 min

380512-84

The first quail call was given at 5:32
The first Dove Cooing given at 6:50 and continued regularly, to
event after completion of 3 1/4 hrs observation when leaving
station at 7:30

7:51 Sundown

8:03 Arrived at camp (no observations recorded except
location of another extensive field below one examined
earlier. about same area in extent.

8:04 Can hear the single grunt of the Dusky Grouse (?)
in direction of Baldy or beyond, coming in about
every 20 seconds. Wind suddenly stopping short
time after sun went down

8:15 R.N. Pheasant, Spurred Towhee and mourning Dove
still calling.

8:37 Moon just presenting itself over Cascades
a little way to the south of the highest peak.

8:38 Weird calls coming from Baldy. All other
call have stopped.

8.45 The weird call is now moving down the mountain
to the west and is close enough to to hear the last
portion of his call.

9:00 Weird call quieted.

9:09 Starting up again but over the brink. Would
say about 1 block west of camp. Called for about
three minutes then quite.

9:45 To Bed

2nd Morning (5/13/38)

4:35 Towhee (Spurred) and Pheasant calling

5:40 Out of bed after expenditure of considerable will power.

5:46 Hummer passing to the east calling.

6:00 Sun shine from Crows Canyon shining on edge of
west side of lake about 1/2 mile south of Pelican Point.

6:07 Yo behold! the sun shine is now crossing the
State road below. point between Orem & Pleasant Grove

6:28 Hummer flew east, calling then N.W.

6:45 Breakfast over, dishes washed and leaving for trail
to Battle Creek with same objective as preceeding day and
same manner of recording. (Complete census)

6:45 Sky clear, not one cloud in the sky, slight wind
and much cooler than yesterday at same time.

6:45 Leaving camp with Virginia Warbler warbling and
a Spurred Towhee singing directly below camp.

6:46 Three Virginia Warbler in Chokecherry tree above
spring. One chased second member through oak trees
darting up & down with frequent contact. The remain-
ing bird fed upon insect on limbs of tree.

6:55 Virginia warbler chirping as he worked along from
tree top to tree top.

6:56 Pheasant has only called 8 times since starting about 6:45

6:58 Pheasant calling & drumming

7:00 3 Towhees, 2 singing one heading 300 ft north of spring
1 Virginia Warbler singing.

7:02 2 Virginia warblers chasing each other.

7:02 Pheasant calling & drumming

7:05 Pheasant calling & drumming up canyon.
7:05 Virgenia Warbler warbling 200' north of spring.
7:06 Pheasant calling & drumming up canyon
7:05 Did not see deer at same point as yesterday
7:09 Pheasant calling & drumming up canyon
7:09 Spurred Towhee scolding more milder than normal.
7:10 Pheasant calling & drumming up canyon
7:10 Virgenia chirping 50' in front on trail. Worked into oak and chirped.
7:14 Humming bird flying east and calling.
7:14 Pheasant calling
7:17 Virginia Warbler chirping louder than usual
7:18 ♂ and ♀ together fought, ♂ fought third member on its appearance. watched at 20'
7:21 Heard Woodhouse Jays on flat.
7:25 Virginia Warbler 40' ahead, singing on top of oak on brink of valley to the left. Flew down hill on approach.
7:26 Area where last towhee was scalding muddy now singing
7:27 Virginia Warblers, one singing to the left of trail, one to the right of trail.
7:27 Fresh deer tracks on trail.
7:28 Magpie flew across head of 1st valley.
7:28 Pheasant calling & drumming
7:29 " " "
7:30 Spurred Towhee feeding along trail, flew into oak and began scratching on leaves.
7:30 Green Tailed Towhee 15' ahead in trail, scratching along edge and feeding on dry leaves, shook feathers occasionally. Area still in shade of hill.
7:36 Pheasant calling & drumming
7:37
7:30 It continued to feed at edge of oak on trail about 30' in head. Followed it along for 150' to a point where trail leaves oak and crosses sage brush area. The towhee at this point left trail and followed the outer edge of oak up-hill. A Spurred Towhee followed along on left side of trail in oak, for about 100 feet. Grosbeak flew across trail and lit in oak. when about 100' feet beyond could hear the bird beginning to sing very feably and incomplete at first. Same area as observed the preceeding day.
7:36 Mourning dove calling
7:42 no wind no clouds. Mourning dove flew from top of oak to left of brink.
7:42 Spurred Towhee & Virgenia Warbler singing on flat far below
7:45 Starting up 1st valley
7:45. Grosbeak seen (7:30) singing again but number of notes few and volume subnormal.
7:45 Pheasant calling & drumming
7:46 " " "
7:47 2 Virgenia warblers chirping 30' east & south all calls have been in 1st valley
7:47 approached chipping Sparrow singing in locust style on top of oak tree. 80' ahead near trail. Flew over head and lit in oak tree behind and proceeded to sing in same volume as before.
7:48 2 chipping Sparrows in oak to left.
7:49 Virgenia Warbler chirping in oak trees as he worked along toward the escarpment.
7:54. Spurred Towhee scalding 40' to left.
7:56 Pheasant calling & drumming.

380513-86

9:59 Spurred Towhee flew into top of oak and sang, approached within 20' and he flew down into oak
9:59 Chipping Sparrow feeding in ~~oak~~ sagebrush; flew up into oak and commenced to chip.
8:00 Spurred Towhee in leaves under oaks resting, 20' away. On approach he flew into another clump of oak.
800 Spurred Towhee scratching 100' to left.
8:02 Spurred Towhee resting upon top of oak 300' away, not singing
8:06 Virginia warbler warbling on top of N. escarpment in oak
8:06 Hummingbird passing to the east calling
8:07 Virginia warbler warbling in top of oak on bunks to left. another chipping beneath.
8 08. Magpie flew over head of 1st valley
8:18 Virginia Warbler warbling 80' to left, flew when within 40' to another oak 20' away and continued to sing each after passing by
8:18 Virginia Warbler warbling on escarpment 100' to left.
8:20 Swainson Hawk lit in top of small oak on top of head of 1st Canyon
8:21 Towhee (2 spurred) singing on top of left escarpment.
8:21 Hummer passed to the east.
8:22 Swainson left perch and flew down over edge and to the S.E. along front of range.
8:24 Four long-tailed Chickadees feeding near bunk of valley, not calling
8:25 Spurred Towhee scratching in oak 20' away.
8:25 Cottontail left under oak in dry leaves and ran over to left and down hillside. Left at 50'
8:27 Mourning dove calling
8:28 Spurred Towhee sing in oak on top of right escarpment.
8:29 Examined last years Grosbeak nest (?) placed in oak 5' high, 12' off trail near head of canyon.
8:30 Pair of swifts flew east along escarpment feeding on way.
8:30 Mourning dove resting upon top of oak on escarpment to right
8:31 Virginia Warbler warbling in oak, passed 50' & he cont. singing
8:31 Leaving head of first valley.
8:35 Spurred Towhee singing on flat to left far below.
8:35 Virginia warbler flicks along side of hill to S. Ed then down hill.
8:36 Spurred Towhee singing to right on top of hill 160'
6:39. Two Virginia warblers flew across trail and worked along in oak to side keeping in head of me for 100'
8:41 Virginia warbler flew from oak down hill.
8:42 Green-tailed Towhee feeding twenty feet ahead near base of oaks, flew down in leaves & continued to feed. Passed by & he continued to feed
8:43 Heard Spurred Towhee singing & one scratching 200' to left
8:44 Magpie flew by.
8:45 B.H Grosbeak feeding and singing in oaks, flew when 20' to him to another oak 30' away and did not sing after.
8:46 Hummer passed to east calling
8:46 Spurred Towhee singing 150' on escarpment to right
9:50 Chickadee offering his two note call without another one answering.
8:50 Starting up second valley.
8:51 Two deer feed up-hill on escarpment below by Buddy.
8:55 Green-tail Towhee feeding quietly in isolated oak & dry weed patch on flat at mouth of 2nd valley. At 12' feet approach flew out and into another stand of oak, work along in upper branches and then flew 40' beyond
8:56 Spurred Towhee & Virginia Warbler sing in oaks on escarpment -

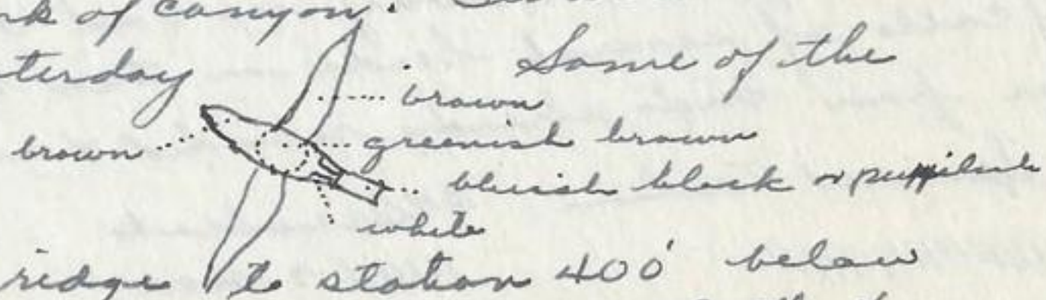
8:56 Grasbeak singing on east escarpment just over top.
9:00 Towhee singing to left, 40' on brink. Passed & he continued to sing
9:00 Humming bird flew west: calling
9:05 Two ♂ Audubons Jasp. approach a oak stand calling vigorously. lit and worked up branches to top of tree & remained quiet for 1 minute then flew west with same call as used in approaching.
9:05 Grasbeak came from brink of valley & lit in oak to sing. I flew across open portion of valley to left and lit in another oak and sang, worked through middle portion of tree singing then upon ground still offering its song. It moved into Towhee territory and was immediately attacked but stayed near by
9:15 Spurred Towhee just starting to sing to the right, approached & he stopped.
9:20 Two ♂ Virginia warblers fighting with ♀ sitting unconcerned 2 feet away. The males held tail like wren. Finally one male chased the other through oaks & ♀ flew across opening to left. Males did not follow her immediately.
9:21 Two Towhees singing 100' apart.
9:21 E. d. atahensis very shy, running through oaks & could not be approached.
9:22 Examined good deer bedding ground under large oaks on flat portion of valley.
9:25 Two Spurred Towhees feeding together, one leading in activity. One remained upon the ground but occasionally the other would work up into top of oak & sing. One was quite concerned about the other and actually met at one time.
9:25 Spurred Towhee & Virginia warbling singing on escarpment 200 feet to right. Heard grunt of Dusky Grouse toward B. Baldy (?)
9:30 Observed two Bibios copulating on trail. General Bombyliidae on trail.
9:31 Humming bird passed west in air, calling
9:34 Call of Dusky Grouse (?) again from Baldy.
9:34 Virginia Warbler warbling on escarpment 200' to right.
9:35 At a point 1/2 way up 2nd valley stopped to record number of calls of several birds in two minute period. Many of the calls are from birds already recorded & are duplicates. Not good of census count.

Spurred Towhee	B.H. Grosbeak	Virginia Warbler	Dusky Grouse (?) (from Baldy)
//////////////// /////	/////// → more or less continuous & difficult to record.	//////////	//

9:40 Two Spurred Towhees feeding and scolding
9:41 Virginia Warbler singing near trail, one scolding. chirping
9:42 Mourning Dove flew from top of oak & left violently.
9:43 Two L. T. Chickadees. One singing on top, the other feeding on oak below. The air was full of Bibio in great numbers. No wind & clear skies
9:44 Spurred Towhee singing on escarpment 400' to left.
9:45 Two Spurred Towhees singing on left escarpment
9:46 Gray headed Juncos flew up 12' ahead into oak four feet away, cleaned bill on limb, then flew down on ground and commenced to feed in shadow of oak trunk, chirping when on Ground.

380513-88

9:46 20' from Junco a Chipping Sparrow fed, and chipped on ground in opening flew into oak. a chippy was singing locust style behind.
9:46 Towhee singing to left on bank in top of oak. paused & while he continued to sing.
9:47 Jack jumped up 30' ahead & ran up trail.
9:49 Virginia Warbler singing at head of canyon.
9:52 Leaving head of 2nd valley, working left around edge of hill near top on trail. Hummer pass west, calling.
9:52 Spurred Towhee singing down hill to left.
9:52 Virginia Warbler singing 40' ahead. strings vibrate slightly when warbling.
9:52 After passing along trail Spurred Towhee commenced to scold 30' behind me. Did not see or hear him when passing by.
9:54 Virginia Warbler flew from top of oak in head & flew directly overhead & hit in oak behind to commence warbling
9:54 At divide looking down into drainage of Battle creek lying to the north & west. Big Baldy bordering drainage to the N.E.
9:59 Spurred Towhee singing in canyon to left & below.
9:59 Sparrow Hawk flying over divide to N.W. Lawn of onions on flat portion of divide.
10:00 Virginia warbler singing to left in canyon 100' away.
10:00 Spurred Towhee singing to right 200'
10:01 Virginia warbler warbling on divide in oak
10:02 2 Yellow-rump Warb. sing to right below in canyon
10:06 Two Spurred Towhees sing & scolding to right.
10:07 Two Virginia warblers fighting & flying through tops of oak.
10:08 Spurred Towhee singing to left on ridge
10:09 Spurred " scolding to right 150' down hill
10:09 2 Virginia warblers singing to right. more butterflies and insects flying in air today.
10 12 On top of Mahogany ridge looking down into valley. Swift flew by.
10:13 North. West extension of ridge now looking directly down into Battle Creek below. on highest point. The falcon is sitting on tree perch on north side of small cliff about 150 feet down west ridge. Watched him for 2 minutes without being detected. was sitting on west side of tree in shade of limb, well concealed When he finally detected my presence began to screamed & continued for 4 minutes, then left perch and circled 3 times and flew up canyon around cliffs & probably lit. very little breeze coming up over brink of canyon. Swallows still commanding same position as yesterday. Some of the younger swallows were colored with more brown on head and back.



10:40 Left top to work down east ridge to station 400' below in mahogany on brink of ridge looking down into Battle & drainage above toward Pimp.
10:43 Arrived at station.
10:44 Lazuli Bunting flew by & down canyon over Battle Creek
Towhee singing 100' to south
10:46 Two Virginia Warbler fussing & chirping in mahogany to south
10:48 Heard Hummer pass, calling.
11:52 Have quite definitely decided that the flight of the swift is one of the commonest acts in nature but yet one of the greatest and unusual phenomena in nature.
11:45 Heard Chipmunk below.
11:45 Counted 9 swifts in air at one time. Birds continually flying & chattering.

11:00 One swallow fluttered in air and continually chirping: gaining altitude. Another flew after in normal flight. Circled after first one for several times then collided & both dropped. Then chasing one another at fast speed. Do not think the contact was close enough for copulation.
11:06 S. Towhee singing & south about 200'
11:06 Sp Hawk frequently calling in Canyon below.
11:08 a E.d. nuttalenis appeared upon the secondary rock slide before it dropped over edge & walked slowly and careful over rock to edge of cliff and then disappeared. It was carrying something in mouth that looked like a large caterpillar or a young chipmunk but did not have binocular or hunt in time to tell.
11:15 a Utah Jay dropped abruptly from top of ledge. straight down to fir stand 300' below. He fell about on a 60° angle or less and opened wings 4 times to check speed.
11:21. ♂ and ♀ Lazuli Bunting fed up ridge from tree to tree offering their indistinct screening Chip.
11:22 Chipmunk left Ridge and work around edge of cliffs. up point along ridge to inspect territory & wave tail gracefully from one side to the other. It did not appear at all afraid of my presence. Quite a contrast to Chipmunk met with ~~up~~ on trail this morning at (9:21)
11:30 At least 18 or 19 swifts in air at one time flying mainly in one group, chattering ~~more~~ more vigorously than usual.
11:30 No wind coming over bunk of ridge. Ski clear, very warm about same all morning. Same place & time yesterday the wind was blowing in good style over edge of ridge.
11:34 Heard hummer going up Canyon. calling
11:40 Heard humming bird in air, calling
1:45 Left Station both swifts still circling & flying about.
11:45 Dusky Grouse (?) grunt from Baldy
11:48 Two Chipping Sparrows & 1 Virginia warbler chiping on way back to top of ridge
11:53 1 Chipping Sparrow & 1 Virginia warbler feeding & chiping 10' away.
11:53 Found large deer horn in mahogany grove, one only ↳. The upper & main prong angled & shot straight up instead of curving.
11:55 Arrived on top 100' south of edge of canyon.
11:57 Two Virginia Warblers singing from top of oak. One looked like ♀.
11:58. Red. tail circling above point.
11:58 Two swifts flying along range going south.
12:00 Red. tail flying due north along front of range without moving wings, flew beyond Battle Cr. Another ~~flying~~ soaring in spiral straight overhead valleyward.
12:10 High clouds forming with slight wind.
12:10 Spurred Towhee scolding 100 feet to west. one singing further beyond & two Virginia warblers warbling to the east.
12:12 Arrived at divide
Two Spurred Towhees singing in valley to the east.
" Virginia Warbler warbling to the east in valley
One Chipping Sparrow singing locust style.
12:13 Spurred Towhee scolding in top of oak 40' ahead near trail. approached within 45' & he flew down into base of oaks. Passed by & continued along trail while the bird remained quiet.
12:15 Virginia Warbler warbling 75' to right.

380513-90

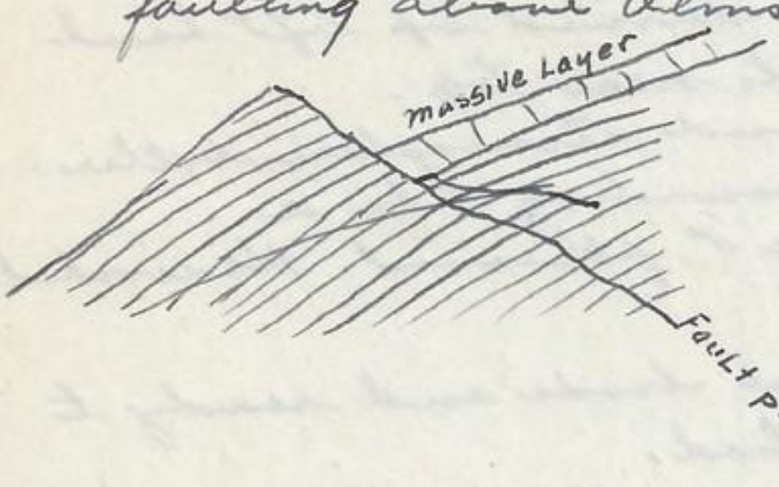
12:16 Two swifts flew over divide
1216 Actnie gopher on divide. Only one seen.
12:17 Spurred Towhee singing on top of oak on hill to east 200'
12:17 Two Chipping sparrow flew up from ground ~~into~~ from among sagebrush and flew into oak. then both flew away chipping
12:19 Spurred Towhee singing to right 400' in Canyon
12:20 Virgina Warbler chipping 20' to left as I passed by
12 21 " " " 30' " " " " " "
1221 Virgina Warbler singing from top of hill to left.
12 21 Colorado Jack heard in dry leaves 30' to left on hillside. Left and ran down into trail. Another jumped up along side of trail from sagebrush and ran 30' into oak and out onto trail where other jack was. When approached again they both run down trail around bend.
12:25 Spurred Towhee & Virgina Warbler singing in valley to to right
12:25 Heard Hummer pass by caching
12:26 Arrived at head of 2nd Valley.
12:26 Chipping Sparrow ~~chipping~~ singing locust style on escarpment top to left.
12:26 Virgenia warbler chiping.
12:28 Ran on to same Jacks in trail 400' beyond where first jumped.
12:30 Chipping Sparrow flew into oak & immediately began singing locust song. 40' away, then moved 20' into another oak & began singing again.
12:34 Junco feeding in oak leaves, flew to oak branch & wiped bill on limb then flew away through oaks chirping.
12:35 Hummingbird to north flying & calling.
12:35 Jack in trail again 400" beyond point where last observed. One had left him.
12:36 B.N. Gnatcatch singing on top of escarpment to left.
12:36 Pheasant calling & drumming at beginning of valley.
1237. Virginia Warbler singing from escarpment to left.
1237. Sighted two ♀ pheasants and 1 ♂ feeding in oaks.
12:38 Junco feeding in oaks flew 60'
12:42 Virgina warbler warbling 60' to right.
Spurred Towhee singing 150' to left of trail.
12:43 " " " flew up from ground into oak 30' away
12:44 E. d. atahensis, same place as seen this morning.
12:44 B. Headed Grosbeak in top of oak. silent, dropped into oak & began calling.
12:45 Two more chipping Sparrows mark to left 40'
12:48 Green tailed towhee & Spurred Towhee left dry weed & oak patch. Spurred left first & flew to adjacent oak then G.T. followed but flew in opposite direction into another oak patch. Saw
This morning flushed a G.T. from same clumps of oak.
1249 Leaving mouth of 2nd valley & starting around hill to head of 1st valley.
12:52 Virginia warbler warbling on left hillside. Left tree and followed along side for 100'
1254 Virgina warbler warbling on left side of trail. One one right side. The one on left side flew up hill to another oak & continued to sing.
12:59. Head of 1st valley
1:00 Chipping Sparrow singing locust style 80' ahead near trail, approach and now is chipping.
1:00 Two virgina warblers singing on escarpment 300' to left of trail.
1:01 Spurred Towhee scolding, left at 35' scratching in leaves.

1:01 Virginia Warbler chipping in oak 40' away
1:06 2 pinyon Jays fley along brink of valley - Calling as they flew north.
1:06 Virgina Warbler on brink to right
1:08 Green-tailed Towhee worked up oak at border of sage brush patch on edge of valley to right. Scaled with crest of head extended.
1:08 Virginia Warbler in oak, silent and not active.
1:12 Spurred Towhee in top of oak, working way through oak when approached at 12'. did not make a vocal sound.
1:14 Sp. Towhee singing right 200'
1:14 Pheasant calling & drumming at end of valley
1:15 Virginia warbler chipping 20' to left
1:16 Stalked on ♂ & ♀ pheasant up to within 40' when they recognized me & flew away with warning call.
1:17. End of valley no 1 & starting around and along hillside to spring.
1:17 Virginia Warbler singing 3/4 up oak on brink. Spurred Towhee singing below on flat.
1:19 More clouds forming and atmosphere becoming duller. no wind and warm.
Virginia Warbler warbling in tree 60' to east.
1:19 / B. Headed Grosbeak sing 200 feet down hill and 150' back up trail.
1:19 Spurred Towhee singing on escapment.
1:22 On approach to spring two magpies gone warning & flew away. Heard Hummingbird fly by calling.
1:24. S. Towhee on brink in oak singing.
1:26 Arrived at spring
1:26 Virginia Warbler fussing near by
1:27 Spurred Towhee singing below camp 150'
Virginia Warbler warbling " " "
" " chipping above camp on escapment in oak
1:27 Arrived at Camp. (End of Complete Census)
Returned to spring in about five minutes for water and found an Otaspermophelus near. It hurried up left hand brink slight, valley lights subdued and atmosphere duller. High Clouds. Found that the noise sounding like a phalarope was nothing more than the ♂ pheasant. He worked along feeding almost into camp.
2:30 Dishes washed and dinner over 3:30 Camp broke and ready to leave for mouth of Grass Canyon at Olmstead.
3:32 (Selective recording) Towhees & pheasants calling & singing.
3:35 At a point around ridge to the N. E, just beyond onion patch on main trail stopped to record song frequency of Spurred Towhees. The area comprised the left hand drainage of Dry Canyon below Begbeldy, an area essentially vegetated with small oak tree. Recording only song of birds not alarm calls but including every song audible all

3:35 → //////////////

380513-92

3:54 → bird worked up to top of oak and started to sing.
3:54 Song frequency of above bird ////////////////////// → 3:59. Stopped and remained on top of oak then in 1/2 minute after he stopping singing he commenced again 3:57½ → ////// → flew → 3:58 and 20 sec.
3:45 Lazuli ♂ lit in oak near then flew on toward ridge
4:00 Leaving station to follow trail across drainage to round knoll at a point where Big Baldy east ridge intercepts the canyon floor of Dry Creek
4:04 Two ♂ Virginia warblers fighting over one ♀.
Heard four Virginia warblers warbling at once one a duplicate in pursuit.
4:15 Arrived at Sanctuary Gate in Dry Canyon
4:21 Arrived at base of cliff where falcon nests but not actively.
4:22 R.S Flicker flew from hole in dead Cottonwood. Flew 400 and then called. Slight up canyon breeze.
4:24 Lark squirrel in dead leaves of oak.
4:28 Arrived below red tail nest in first set of cliffs in Dry.
Heard yellow warbler
4:32 Arrived at mouth of Canyon Proper. Seen large Swallow tail butterfly flying up canyon. Quail Calling.
4:40 Only 2 Spurred Towhees calling at mouth.
4:41 Magpie with young suspected on trip up, near nest.
4:45 2 Mourning Doves flew by.
4:50 4 " " feeding on ground.
4:50 Heard Sp. Towhee singing to left in oak
4:52 " 2 " " in Bonneville level.
4:54 " one " " " "
4:56 Marmot on edge of Bonneville level.
5:00 Mourning Dove flew from ground.
5:04 Three Rock wrens in Canyon cutting across Bonneville Level.
5:15 Are now on of Bonneville Level at a point on the brink where cliffs at mouth of Canyon at Olmstead can be seen for first time.
5:35 Arrived at ridge west of Olmstead at a point due north of steam electric plant. Can see red-tail flying around old nesting cliff up Provo Canyon. Swifts were seen at this point
5:40. Left pack here and worked back up to cliffs to investigate faulting above Olmstead. The beds at the point on west side of Canyon have an interesting sequence. The profile shows alternate solid beds of limestone with chirty centers with inter layers of highly fractured sets. The solid beds are resistant & stand out in relief. Each bed is about 1 foot thick.





Fault Pattern.

6:30 Back to point where pack was left and car returning exactly on time as arranged.

380521-93

5/21/38 and 5/22/38

Spent two days on west and north exposure of Timpanogos leaving Sat. morning and returning Sun. evening. Craig Wayman and myself made the trip. Left mouth of Grane Creek Canyon at 10:10. With about a 35 lb pack found the going relatively easy and frequently stopping to make observations. The entire trip was one, essentially of a selective nature, the terrain not inducive to complete census and the extent of the cause in which we were to cover was to great to include a complete census. On way up graded trail, observed the Sparrow Hawk soaring over canyon and frequently calling and several swift manuvered in air. The Spurred Towhee could be heard on hillside. The country in general was fairly well developed. Arrived at first water from permanent spring half way up graded trail. The flow was possibly more than normal with many black dead leaves choking the sides. It took us just one hour to make the trip from mouth of canyon to this point. The sky was clear and weather warm, slight breeze. Had heard several Virginia Warblers (?) on way up but not until 11:30 on north trend of canyon did I see it for positive identification. It was feeding and chipping in Mahogany grove on left of trail on hillside, 30' away. Another bird was near. 11:45 arrived at point above fall where classical example of slickensides presents itself along trail. Temperature at this point was 100° in the sun. The Sparrow Hawk was soaring upcanyon near first spring (11:30 above) The Woodhouse Jay (2) were seen at mouth of canyon. The Hummingbirds (Sp.?) appeared to be more sedentary in habit that those observed flying back and forth along lower exposure a week ago. Many Bibios were flying in the air. Arrived at crossover 11:55. The water was more than filling the gulch and could not cross at usual point so found it necessary to go down about 70 feet before gaining the other side. Craig readjusted pack and we were off again at 12:00. As we approached the first flat portion of the upper flat drainage at 12:10 were greeted with the scolding call of the Utah Jay (4 in no.) The stream here is normal in capacity and clear. The gophers were active but the vegetative covering not very well developed. The entire ground is covered with a green growth but very small. Several patches of Seal measured about 1' in heighth, grading down from this height. The stungingnettle was even smaller being about 9" or 10" in height

380521-93.1

A cooper hawk soared by in air. At 12:40 we had reached the head of the spring running along at the left of the main trail. Turning to the north we started toward the divide of Grove and American Fork Canyon. Had lunch at 12:45, temperature 48° Skies Cloudy and wind from the south, day dudler. Storm Clouds coming on rapidly covering the entire Utah Valley and top of Timp. Left 1:06 and keeping on trail at the upper limits of aspen beyon which by the sagebrush covered hill and then Temp proper. Four chipping feed on ground & in willow tree. 1:36 Hammer passed by calling. No wind at present but noticable at times. Threatening clouds on all sides especially to the north. This Stormy condition came on quite abruptly. 1:40 G.H. Owl flew from aspen growth to about 300' beyond near trail and was then flushed again. A wet snow began. The aspen trees in this entire valley between Mahogany ridge and Timpanogas was about 50° dormant and 50° showing a yellowish green cast. There seemed to be no factor that governed the new growths practain, could be either high on valley side or low. Each yellow patch was more or less in in one or associated groups. The stage of growth would include Chokecherry 1st, aspin scond, bapeleders that were growing along upper course of spring 3rd, and oak last. 1:50 Four deer had evidently been walking single file in upper trail 300' to right for when seen first were in that formation. after their curiosity had been satisfied they left with a jump. Fourty pine siskins were seen in air flying to west, in about 2 min another flock of about the same number flew back again ✓. may represent same flock. Before we finally reached our destination at divide we had experienced considerable snow and cold winds besides snow patches to wet us to the skin from knees down. Arrived at divide at 3:00 in rainy sleet with intermittent winds. By the time we had camp constructed the sleet had subsided and clouds cleared so that sleigh runner mountain & granite peaks were visible. The snow in vicinity of gate ~~were~~ was free from the N.W slopes to divide but it still remained around for stand and on lee side of ridge leading down west from Mt. Aspinwall.. The prevailing winds were evidently from the south. At 5:30 the audubon Hermit thrush began to sing. Continued for several minutes then stopped. Noticed at this time that several Cassin Finch and Pine Siskin were arriving from the south in the upper Grove Creek drainage and alighting in tops of fir before continuing up over divide & down into Am. Fork side

380521-94

Being camped just 30 to the west of the large stand of firs at base of [redacted] Mt Aspen Wall & north terminal of Trump were able to get a fairly accurate check on the number of birds in this northern flight. Was rather interesting why these birds came in such regularly and sameness in line of flight. Before continuing on their journey after reached these fir an hour they would either sing or rest in tree tops.

Birds passing by camp.

5:46 Two Cassin Purple Finch, paused at top for about a minute then sang and then continued journey. ♂ ♀

5:46 Four Pine Siskins pass by & stopped to sing. Temp 50°

5:48 One Siskin, stopped & sang.

5:49 1 Cassin Finch paused & sang on top of fir tree

5:50 2 Siskins " " " " " " "

5:52 2 Cassin Finch " " "

5:52 3 Siskins " " " " " "

5:53 (" " " " " "

5:54 5 " " " " " "

5:56 5 " " " " " "

5 57 1 Cassin " " " " "

5:57 6 Siskins " " " " "

5:58 Brush beginning to sing again)

5:58 About 8 swallows flying north over divide nearly high enough to be out of site. (Sun beginning to shine through clouds.) Wind very cool.

5:59 1 Siskin paused & sang on top of tree.

6:00 1 " going in opposite direction (only bird seen flying in southerly direction except flicker & sapsucker. 40° F.

6:05 1 Grey headed Junco arrived and fed in sage & sang in fir trees.

2 Cassins ♂ ♀ paused & sang.

2 Siskin paused & sang

2 Siskin " " "

1 " " " "

2 " passed by without stopping in tree top to sing

6:08 3 Grey head Juncos working up to top gradually feeding and fly in short slop stages.

1 Cassins Purple Finch paused & sang.

6 Swallows flying low over divide

1 Siskin paused & sang.

6:15 2 Cassin Finch ♂ ♀ paused & sang.

5 Siskin flew by without stopping

6:28 One Audubon Warbler came chirping and lit in fir tree to continue chipping.

6:28 5 Cassin Purple Finch flew by without stopping. Did not offer notes while in air as the rest usually did.

2 Siskins flew by but stopped to sing.

1 R.S. Flicker flew into firs from the south.

4 Siskin flew by & lit in tree to sing.

Eleven Siskin arrived, five lit in trees to sing & fuse while six continued on journey.
1 siskin paused & sang
3 " " " "
6:35 3 Juncos (Gray headed.) paused & sang.
1 Siskin " " "
4 Cassins " " "
6:42 5 Siskin " " "
2 Red. Naped Sapsuckers flew from fir stand and lit on drift fence near tent.
6:46 A.N. Shrank paused, then continued. (6:45 — 42° F)
2 Gray headed Juncos paused, fed.
6.50 5 Siskin paused then continued.
658 2 Siskin " "
7:00 1 Siskin " " " End of flight

8:15 G.T. Towhee scolding
8:30 W. Robin singing (dark now)

5/22/38 Next morning:
up and ready to leave at 8:00 Sky blue with a few white clouds. but cool. Just as we were leaving a weasel left the fir stand and ran across snow into sagebrush to the north.
8:20 G.T. Towhee sang and scolded in sage brush on divide
8:30 Observed five Juncos in firs just over edge of divide leading into A. Fork Canyon. 2 were definitely courting, consistently following the other from limb to limb and occasionally elevating wings. Now following regular trail along the upper bench toward Altamont. Heard kinglet singing.
9:00 Left trail and now looking down into cirque below peak. Seven gulls were flying up and circling right hand fork of American Fork at about our altitude.
9:10 In life crossing talus of snow below high peak in cirque saw 2 umbrinus (?) feeding in willows. Being far from cover the chose to remain in willows rather than try to run to cover.
9:40 After crossing snow field and working up trail to top of last ridge we saw a siskin hanging from some branches of a fir tree. It attempted to free itself several times by rapidly beating its wings but of no avail, however, his last vigorous yerking free himself whereupon it flew into another fir 50' away and recovered & felling quite relieved. He did fly back before leaving to view the trap once again. Could not account for the incident.
10.20 Just before arriving at last ridge saw another umbrinus (?) in fir tree. Leaving the trail at this point we walked up on snow ridge leading toward highest peak. Gained first prominent set of cliff and stopped to view country. While at this point had the unusual experience of having a reserve

seat for one of the most unusual sites, a snow slide in action. The snow began below high point and continued to slide on surface of older snow until it reached the lower set of cliff when with a roar [redacted] it plunged out into the air to light far below. It took on the appearance of a water fall except the flow was very irregular, occasionally increasing volume 6 or 7 times [redacted] along with increased velocity. Two Golden Eagle circled above, one passing occasionally out of site when encountering a mist cloud. A flocks crow worked up ridge and let in Pinus flexilis before continuing his journey up into the lands of winter snows. a misty looking clouds. One of the pair of eagles was exceptionally marked with white upper tail area and white area under wings. Either a Coopers or Goshawk also flew by, it was flying at glide a heighth and looked like Coopers except for size. I took two views from this point, one looking up toward high peak to right and one up cirque to left, leading up from Timpanogos Basin. Both, 1/25 X 28. The eagles came from direction of high peak and about 3/4 distance to top. Left this vantage point and retracted [redacted] to old trail and followed back instead working across the snow field above. Stopped at spring near point on rim of Canyon before taking trail to the south. At this spring, the bluebirds, Hairy woodpecker, flycather (?) and Junco (Gray headed) were seen & heard. The Junco, one of a pair, carried a plant fibre in its bill but dropped it when perched above on a tree. Duck weeds grew in the pond. 200' N.E from pond, on trail we found the imprint of a bear which had probably passed about 2 day previous. The trail was steep & slick, his tracks and sliding imprints were found at the end of a 2 foot drawn out print. Several Coyotes tracks were also seen in trail as well as a few deer. The deer however, had not used the trail consistently because of the snows that still remained in several areas. East of this spring we found an old hawk nest that had been fixed up this year. It [redacted] was placed in an aspen tree in a grove of aspins. At a point N.W. of spring an prominent point, looking down into Am Fork Canyon, one get a view of Mt. Aspenwall that would be rather diffecult to match. A photograph from this point would certainly be a fine picture that would be hard to bet. It is probably the best subject mountain of the the entire mountain range. One also gets a beautiful view of the north side of Am Fork Canyon, the left fork of Canyon, high Uintahs, and all intervening country.

Arrived at Camp at 1:45 packed & had dinner & left at 3:30

380522-97

Followed west on divide to lowest point, then started down across the open flats. At a point west of government (?) spring ran into a small head of elk. They were on a small knoll in a very conspicuous & exposed situation, some resting, others standing. Watched them for about 20 second at 400' or less & then they all stood & finally trotted out of site over knoll. We followed to knoll & could see them standing in bottom of gulch to the west. They started again and soon trailed into aspen & out of view. They were on a hill that supported very little grass or young plants, their purpose probably not for feeding. The tracks seemed to be concentrated in these upper flats of the Grave Creek drainage. Quite a sete to see the brown with darker heads & white rump patch of these animals. They move right along but are not as graceful as the run & trot of a deer. Arrived at last flat before starting on trail down canyon at 5:00. Arrived at spring 5:26 & mouth of canyon at 6:05. A desirable way to plan a trip from mouth of Grave Creek to Pimpaneke Basin would be to leave some late afternoon, allowing just enough time to make the head of the Grave Canyon Proper and camp on first flat after making first crossing of main stream. Take the second day morning to pack into the cirque on north end of mountain, spend the remaing day, night & next morning in this area & then in the afternoon of this third day drop down into the Pimpaneke Basin. On an extended trip one could then continue up over into Emerald lake & down to aspen the next two days. In working across from divide at camp to ridge looking down into Pimpaneke Basin heard about 15 Knight regularly distributed & generally offering their call, Two Dusky Grouse, one flushed from ridge & flew into fir when approached & flew to east & another flew up into another fir near by. I also left as did the first one to the east with a tilting of body & tail to gain momentum, The citellus armatus were every where, not in normal numbers but in every locality, some sounding as if from area overlain with a pure white sheet of snow. Their calls were more frequently heard than the site of the animal. Heard Steller's Jay in upper areas & seen rock squirrels in lower stretches near Grave Canyon proper. Mountain Chickadee fed near camp. The citellus armatus were first observed on open flats 2 blocks east of first nights camp!

380522-98

From vantage point on ridge ~~between Pimpaonoke Basin and~~ in cirque on north end of Pimpanogas. The snow is still carrying its wintery appearance and still subject to surface slides. Two slides passed in review from the point. Both in same tract starting from highest point and leaping out over lower cliffs. 1/25 X 28 clear atmosphere. ~~Focus at 8m feet.~~



1-5-22-38

Taken from ~~same~~ point as one ~~Along~~ Ridge between Pimpanoke Basin cirque on ~~Along~~, but looking into the north end of Pimp. Pimpaonoke Basin cirque. Here again winter is in command without any bare ridges in evidence. The brink of the cirque is shown in lower left section of picture. A scraggly fir lends an artistic touch in contrast to a delicate background 1/25 X 28 clear atmosphere



2-5-22-38

Same as first picture but focus normal to accomodate distance 1/25 X 28 clear. A mutercher was observed flying up this ridge toward high point. Snow slightly wet and cold on bat contact. Crusted before sun in morning but on level exposure will let one down to knees. The slide field has suffered several slides in last 3 or four days.



3-5-22-38

Taken from same point as no 1 1/25 X 28 clear atmosphere following day of stormy weather. Haunts of the eagle & Clarks Crow.



4-5-22-38









380522-99



(Ref only)

Itinerary of second day. Reference picture of previous years taken earlier than time of our trip. Camp situated just east of fir stand. Prominent Conifers encountered on route were Abies concolor and Pseudotsuga mucronata.



(Ref only)

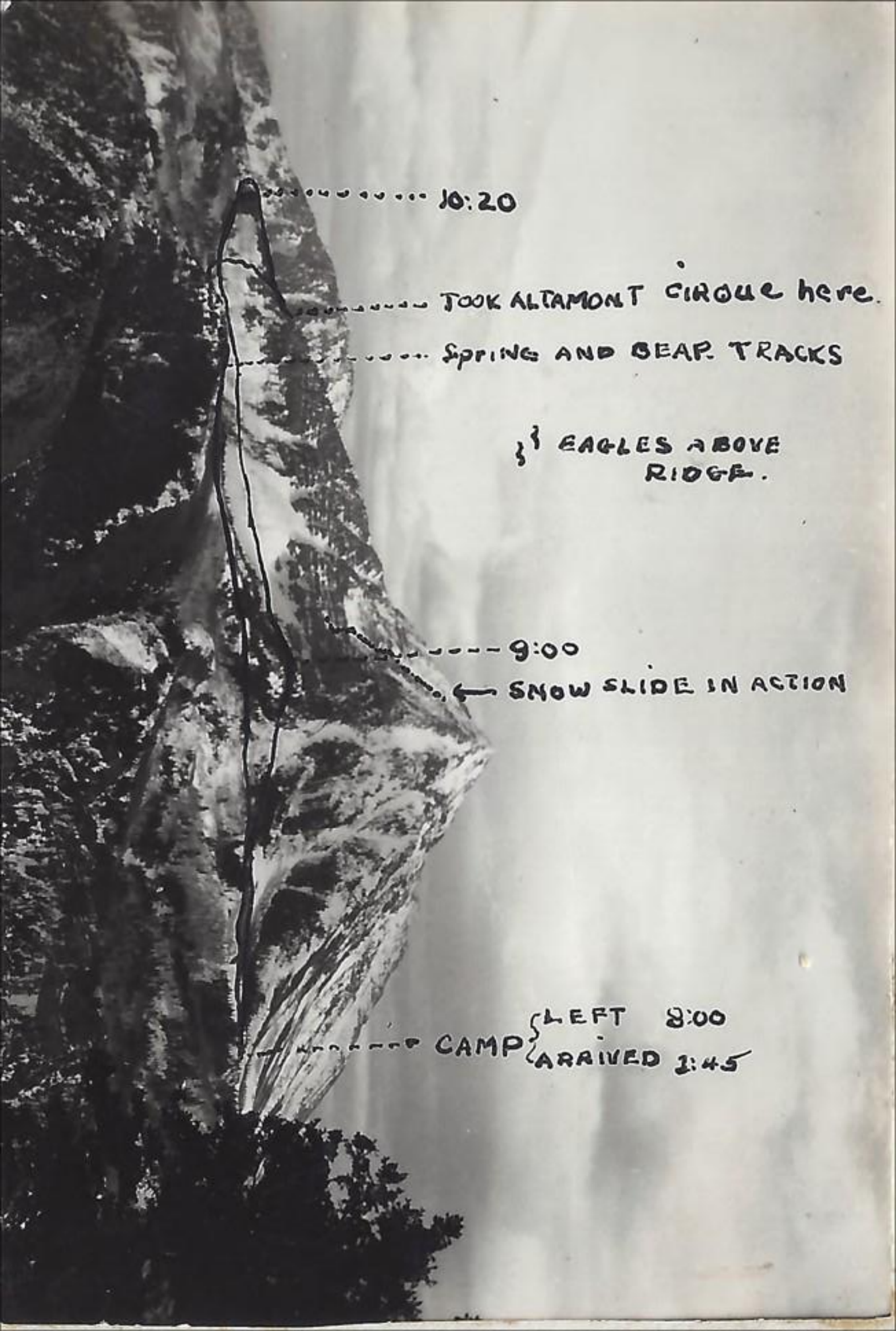
Itinerary of first day and return the second day, showing upper drainage of Grave Creek up to divide of drainage & American Fork Canyon. Reference picture taken on a earlier day of several year previous.

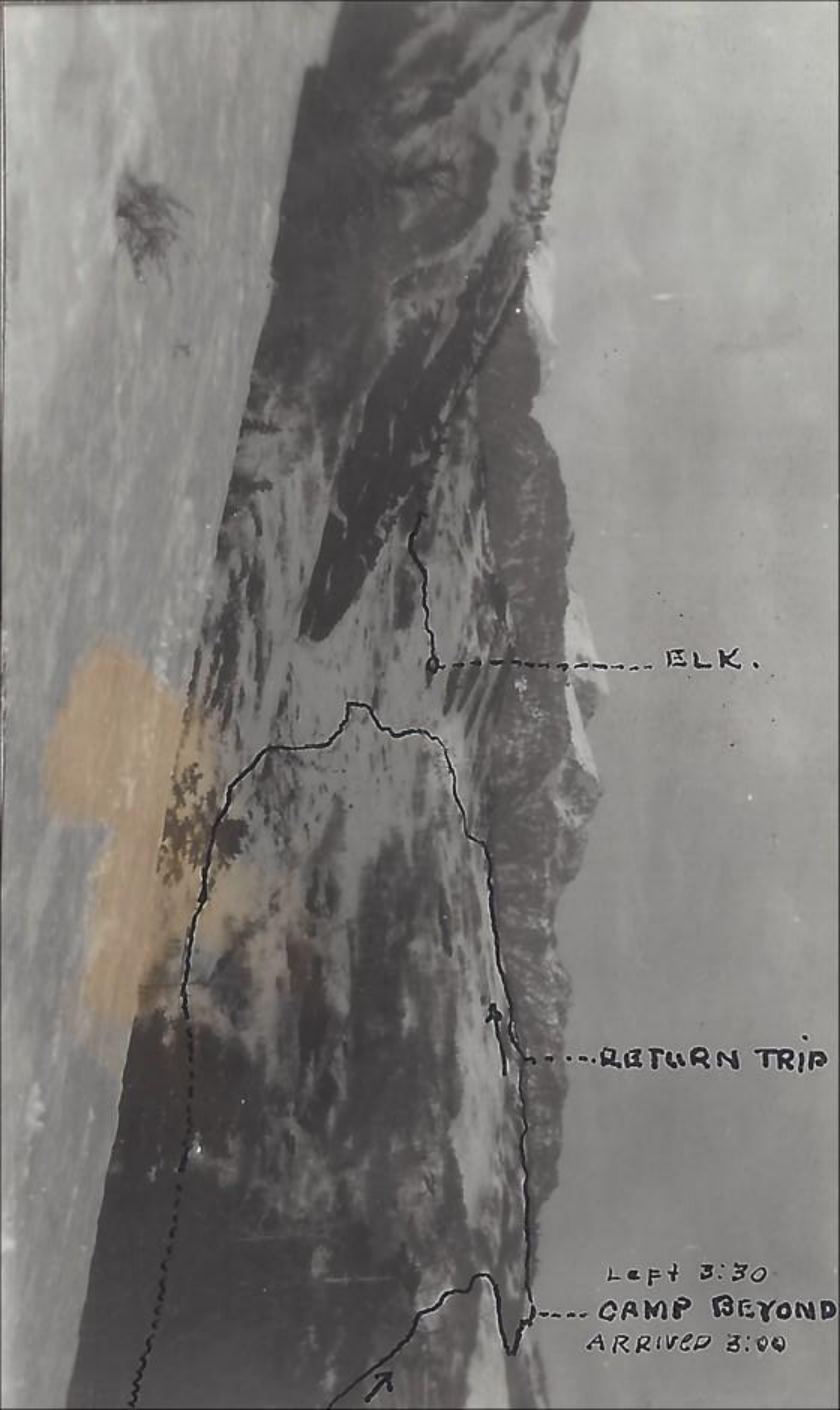


5-5-22-38

North terminal of Timpanogas under the blasts of white clouds & high winds. From ridge between Timpanoke Basin and cirque on north end of Timpanogus. The high and exposed ridges bear overlaps of snow on lee side. Several section have broken loose and no doubt have caused snow-slides. Eagles sighted in such an atmospheric condition frequently passing through lower limits of mist clouds. 1/25 x 28 clear atmosphere without purple hazes.

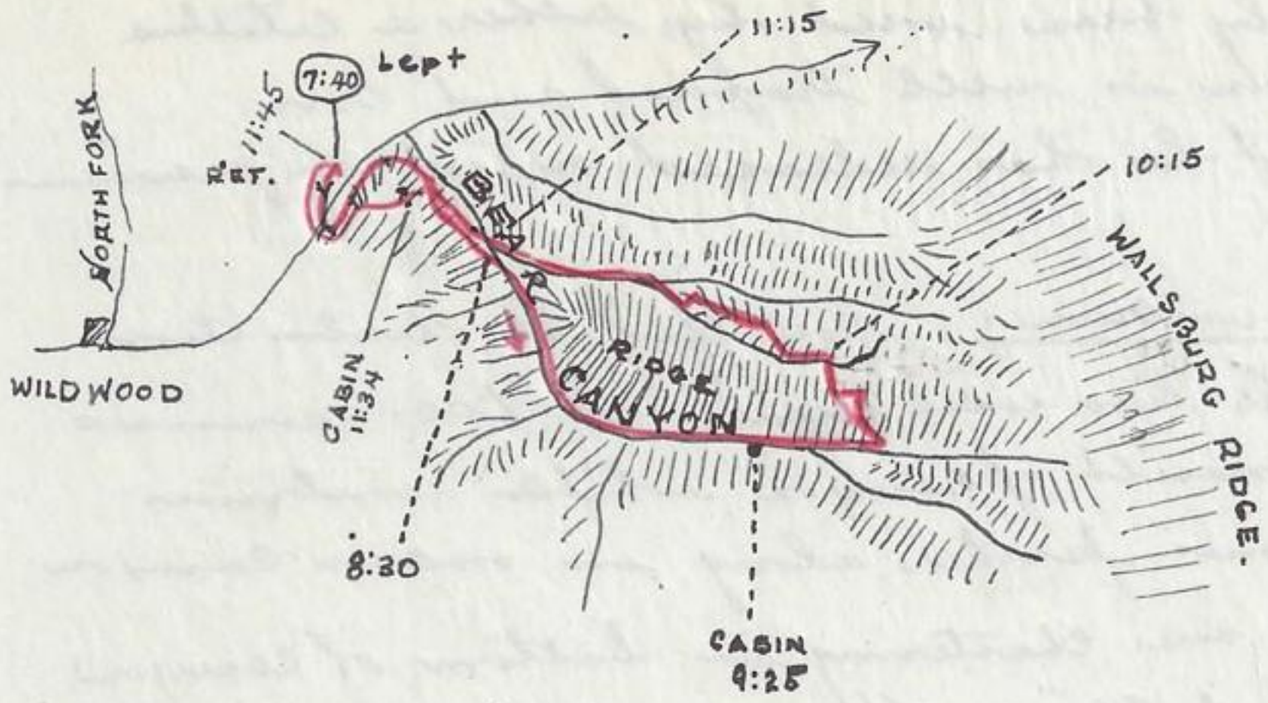



10:20
TOOK ALTAMONT CIRQUE here.
SPRING AND BEAR TRACKS
EAGLES ABOVE RIDGE.
9:00
SNOW SLIDE IN ACTION
CAMP
LEFT 8:00
ARRIVED 1:45


ELK.
RETURN TRIP
Left 3:30
CAMP BEYOND
ARRIVED 3:00

5/26/38 quart

3Q0526-101



Made hurried trip up bear Canyon to take set of eggs and procure specimen of Goshawk for a determination of this locality. Followed trail beginning at railroad bridge and held to main canyon. At a point where canyon divides into equal sized canyons and north ridge between, left the trail and gained access to divide of ridge to the north. Followed down ridge to second divide at a point where directly below the next canyon to the north terminates. Dropped to the bottom of the canyon and followed down about 1 block, then gained top of next ridge to the north, hence down crest of ridge to its beginning and then down first left fork of Bear Canyon to main canyon. Instead of going down to river and around to railroad bridge followed trail up to cabin then down to river making a considerable short cut. Weather warm and skies clear except for a few high clouds. Sheep on range and camp just being moved into mountains.

Birds and animals seen.

Citellus armatus. The citellus were very generally distributed meeting up with them in all the varied habitats visited today. Were frequently seen scurrying along in head running up trail or heard scrambling over the dead oak leaves in attempt to make the trail clear for the intruder. Their calls were ever present from canyon bottom, hot & sunny hill side exposure, from beneath the dense oak cover, in aspen stands and exposed ridges. One was found in upper branches of a 10' high rose Hawthorne at 7:55 am no mild shaking of the tree changed his repose in the branches. Did not call and remained there after leaving.

Badger. Numerous diggings in canyon floor, both extensive excavations and surface scratching. One area supported 4 or 5 normal size holes. Not only were the digging exporations in canyon floor but on hillsides and ridges. It appeared as if, in many cases, that the holes were dug in attempt to get at the gophers & citellus

38050 26-102

because many of the smaller animal holes ~~were~~ had been started but abondonded. One hole excavation showed considerable debris and contained a nest of bark fibers and weeds that had evidently been used by either a citellus or gopher. This canyon is well trapped and Mr. Wolffinden states that he has released many in previous year from his traps.

E. m. minimus and E. umbrinus. Doubtful in distinction but am quite sure the two were seen. At 8:00 minimus was observed near mouth of canyon while umbrinus was seen several times further along in main canyon.

Sciurus N.V. could hear one chattering in bottom of canyon from upper trail about 8:20. He was several hundred feet from the nearest group of firs but in a fairly dense covering of aspen, maple & oak.

Spurred Towhees. Generally distributed throughout entire trip favoring the more open hillside. Since these canyon have been fired periodically there has been a good growth of scrub oak as a replacement which in turn is a favorable Towhee nest cover. The birds were heard scolding, singing and seen scratching in the dry leaves beneath the trees.

C. T. Towhee. About 8 birds presented themselves generally found near trail edge leading up canyon. They offered their characteristic call.

Chipping Sparrow. Seen one bird which was feeding on ground in bottom of canyon and flew up into tree on approach

B. H. Grosbeak. Heard several pairs and watched one ♂ singing in top of fir tree along trail. at 8:20 Issued the east during song.

Mourning Dove. Heard this bird calling at 8:05

Nuthatch. (Sp.?) Probably the white breasted. Heard & seen at a distance. Just one bird observed.

Hummingbird (Sp.?) Heard frequently flying up in air and calling. One bird was seen in aspen grove at 915, flying from one dead limb to another beneath the upper green foliage While watching one bird it decided to make personal call and hovered 2 feet from face.

L. T. Chickadee a few bird feed in growth at bottom of canyon.

Vireos Looked like Western warbling and another species. Frequently met with in aspen in canyon bottom. Several

occaisions one bird would be seen to be chasing the other.
Their calls frequent.

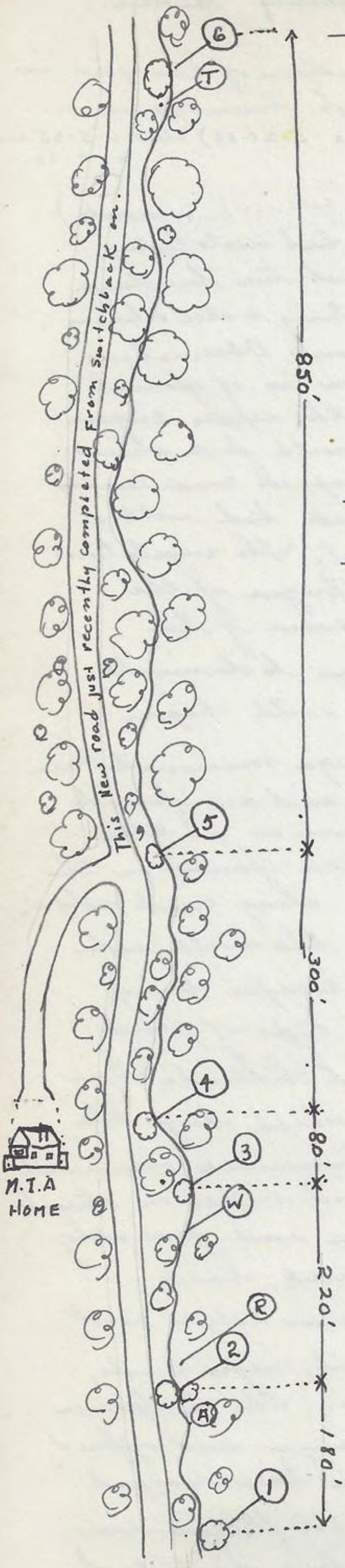
Audubon Hermit Thrush. One pair fed in bottom of canyon in oaks another seen along working through branches in canyon bottom.

(Entered May 27, 1938) 7/10/38 (see page 249 for proper date sequence)

Examined several Broad-tail humming bird nests today that Dad has had under observation for the last two Sundays. All nests were faund in main canyon supporting water above Stewarts Flats in the North Fork of Provo Canyon. Observations around 3 o'clock P.M. This interesting canyon is of glacial origin and now carries the snow melts from the upper cirque of Timpanogas down to the junction with the north fork stream. The waters are cool and pure to look at and dropped considerably during its course, rushing down the bouldered creek bed with a continuous roar, possibly carrying 25 second feet. The vegetation along the narrow glacial canyon is essentially a tongue of the upper elevations which has brought with it some of the higher living forms. The Engelmann Spruce seems to dominate the conifer trees which is generally assocated with higher elevations. A few Abies concolor and Pseudotsuga mucronata are mixed in with the spruce along the creek edge and are found on the south hillside but taking over the domance as they work progressively up hill. Very few conifer are found on the north side of canyon even limited in number along creek edge. While the south side is covered with conifs the north side takes on a entirely different appearance, the conifer being replaced here by aspen, oak, maple, ferns and teppe-ty plants found in assocation with a hot, sun exposed hillside where Citellus calls were frequently heard.

Assocated with the Spruce are the willow which hugs the creek bank and found intermittently; the Kinnicanic occasionally found on stream bank; aspen which is found either on stream bank or on either side; Cottonwood, large size and generally distributed; birch found commonly along creek bank; chokecherry; rank growth when found on stream edge and many minor teppes like elderberry, monks hood, negro heads, stinging nettle, Symphoricarpus, and many others. The E. Spruce however were the trees that dominated the canyon and offered the favorable nesting sites for hummers. These trees ranged from 2 feet to 80 or even higher. The human influence was evident with camp sites every 200' and an sundays hundreds of cars passing within 30' of nests.

380527-104



— nest no ②. B. T. Hummingbird. Placed in Picea engelmannii 4½ feet high, 3' from bottom of tree, 38" from water. Creek edge directly below! nest 1' from peripheral edge of branch. The nesting tree under protective shade of large Engelman Spruce 3' though base and completely shading creek ∨ nest. Geranium, columbine (short spurred) ∧ large Chokecherry grew on outer edge of large tree 8' within area of nest. Mosses covered the damp ∨ cool creek edge beneath nesting tree. The roar of stream made human voice inaudible 30' away. Canyon about 150' including beginning of slopes on each side. Area in association with: Abies concolor, Pseudosuga m, cottonwood, aspen, service berry, oak, manks brad. Two weeks ago nest supported young today birds had left passably a day or two ago. Dumped accidentally when camp erected, 20' from road.

— nest no ④ Olive back Thrush. In Spruce near water edge.

— nest no ① B. T. Hummer. Placed in Picea engelmannii. 60' high, 4' from above water, 2' overhanging edge of creek. nest 1 foot from edge of branch. nesting tree in group of Picea and nest placed on green limb directly above the lower dead branches. Roaring Water ∧ was unseen. Another alternate nest 4' from one being used. Two young birds rested upon nest in opposite directions but both conforming to trend of creek. When approached 2' they left one at a time but flew adeptly. Nest usual but flattened, the platform having two body grooves of resting birds trending in same direction as stream. The nesting limb was protected by the upper limbs of the tree which overhung the creek 8 feet. Across from camp site ∧ directly across from camp site.

— Nest no ③ B. T. Hummer. Placed in Eng. Spruce 60' ± high, 74" above water, 8 foot overhang. Tree leaning over Creek slightly, and nest placed on first green bow above the lower dead limbs. Nest 1 foot from outer peripheral edge of branch. The young had hatched from this nest. Nest placed on 45° dipping branch. At camp site Abutting against camp site

— nest no ④ B. T. Hummer. Placed in Picea eng. leaning slightly over water. Tree 5' high and nest 4' above water, 1½' overhanging from edge of creek bank. Small tree unshaded by larger ∧ tree but in association with small trees which were close by. Two weeks ago 8' from road it was ¼ constructed. Bird sitting with head down stream. 1 foot from peripheral edge of limb. Tree entirely green below

— nest no ⑤ B. T. Hummer Placed in Picea eng. 70' high. nest 9½ feet above water, in center of stream 3 feet from either side of bank. Place on first green bow above dead lower limbs. Thoroughly protected from sun but offered easy escape for birds. Bird on nest facing down creek. About 2' from peripheral edge of limb 10' from road.

nest no ⑥ B. T. Hummer. Placed in Spruce (Picea eng.) 11 feet above water, 2' from edge of bank. Nest on first green limb above dead limbs below. Tree 70' high. 1½' from peripheral edge of limb. Entirely protected from sun and found in usual association. about 15' from road.

nest no Ⓣ N. Tanager. Eggs two weeks ago. nest placed in abes concolor 20' from creek and 18' up on tree on horizontal limb.

nest no. Ⓦ Ouzel. nest on water level & usual. Birds feeding young and continued until late twilight. Left and birds still feeding. Time of feeding varied from 30" to 5 minutes. with each visit accompanied by vigorous calling of young birds. Parent bird fregently fed 10' from nest along side of creek.

nest no Ⓡ Robin and mouse. 30' from creek located old Robin nest which was placed in lower branches of Spruce at outer extremety 5' from ground. The nest held 3 untouched robin eggs while directly above the nest and inside of cup was an superposition two divisions of a mouse nest. The first layer of hair, sheep wool and very fine inner bark about 2 inches thick was directly upon the eggs & in cup while above the first layer another layer of coarse inner bark of either aspen or cottonwood was superimposed upon the first layer. The upper layer bulged beyond the confines of the nest and had central cavity as nest room proper. Rather unusual that eggs were not touched.

Nest No.	Tree	Heighth above water	Creek Over hang	distance From perepheriak edge of limb	Protection	State OF Nest cycle	
1	Picea engelmanni	4'	2'	2'	Tree bows above	young capable of flying.	
2	Picea engelmanni	38"	4"	1'	Shade of Large engel.	Birds Left day or so ago.	
3	Picea engelmanni	74"	8'	1'	Shade by above branches	Birds Left day or so ago	
4.	Picea engelmanni	4'	4'	1'	Unshaded except by small top above	eggs (2)	
5.	Picea engelmanni	9½'	3'	2'	Thoroughly shaded	? adult Bird on nest.	
6.	Picea engelmanni	11'	2'	1½'	" "	Birds Left nest.	

All nests were within 30' of road with at least 30 cars passing by today (Sunday) Camp sites abutting against a few nesting trees.

Rather interesting to note the apparent influence of the new road construction from switch back at M.T.A. home up to first open field toward falls. Nearby all nests placed above roaring water or rumbling water near. Nest no (2) had the outer surface of nest entirely decorated with green liverwort plant leaves.

Left Stewart Creek and from Girls home climbed up north slope of canyon into secondary valley leading up toward Cascades & Falls and ending abruptly as elevated valley that has subsequently been severed from its upper limits. On way up hill found the Citellus armatus to have used some areas so extensively that well beaten trails radiated throughout the lain sections of the slope. The main trail in the upper valley was pulverized by the continual use of citellus. Six Badger holes were seen and now being used by the ground dog. Stinging nettle & mugwreads formed a dense growth 4' high on valley portion proper. Aspen & maple predominant growth. Dropped down into main valley & found Symphoricarpus had blossomed and were now bearing ~~berries~~ seeds. Several bells and withered flowers of Symphoricarpus remained. Noted one Thamnophis. o. vagrans on stream edge in dense weed growth.

6/9/38

Left Provo on the 9th of June with University Survey to continue biological work in Garfield and Wayne County, the objective to complete series of mammals and birds and to run transect from the east end of Aquarius Plateau down through Indian Gulch to Make Tanks on the Circle cliffs. Dr. E. Eldon Beck headed survey with Stelmer Tanner, George Cannon and myself on the crew. Traveled in capacity of mammalogist and ornithologist.

Preparators equipment taken:

1. Three batts of California Cotton.
2. Cardboard & wooden bodies.
3. Paper towels
4. 1/2 pint of straight pins
5. Scalpel
6. Scissors for skinning
7. Forceps. (sharp pointed)
8. Large fleshing knife
9. Millimeter calipers
10. M.M. Tape
11. Large file
12. Carborundum
13. 1 1/2" nails for mounts
14. 5 quarts of ammonium hydroxide
15. 1 pint of arsenical paste
16. Brush for paste
17. Needles (extras)
18. 4 sp. of extra heavy thread no. 8.
    1 sp of no. 40
19. Skinning hooks
20. Alcahol and vales for ectoparasitic specimens
21. Preservative for specimens and embryos etc.
22. Gram weight scales
29. Cornmeal & skinning tray
30. Ink, pens, pencils ~~etc~~.
31. Evaporate Cooler
32. Medical swab sticks for birds.
33. Card Table
34. Oil cloth for table
35. Camp chair and pillow
36. Large skinning tent
37. Scrubby brush & wash basin
38. Rat bait (oatmeal & wheat)
39. Extra red flags
40. Trap markers
41. Tooth brush for furs
42. Recording note books, 8 of. 5 3/4 X 3 3/4. size

5/28/38

Edward Free informs me that on this date he discovered a rattle snake with 5 rattles and one terminal button. ~~me~~ asured 2 feet and 1 inches in length. was resting on ground 2' from edge of trail at 1st flat of Rock Canyon. First flat is in series of upper flats of Rock. He also reports 2 blow snakes in same canyon. One at Rass Snaw slide at the first gate and was stretched across the trail and matanless, and the other one on Second Flat in grasses and weeds. Observations at 10:00 A.M.

6/5/38

Dad and I visited Mr Spafford in Hobble Cr. at 2nd station. He has been with cattle association for eight years. He said that a ruffed grouse had been run over near balsam Camps and he cleaned and used it for foods, one egg with hard shell in oviduct. Had located Robin and yellow Warbler nests and eggs. numerous beaver in Hall and Wadsworth Canyons. The two beaver that had been at Balsam Camps for many years were driven off when C.C.C blasted area in road building operations. A small lake some 300 yards from bottom floor of canyon held several hundred salamanders. Lake dries up entirely in summer. Dusky Grouse always found on high mountain on west side of Right Fork. nests of Grey Ruffed generally found in bottoms of canyon proper near streams and large growth. We saw 3 deer on high ridge west of Right Fork. At mouth of 1st canyon on north side of Hobble down from Right Fork collected a blue racer in grass near a spring. surrounded by cottonwoods. Collected set of Green-tail towhee in artemesia area between creek and the abrupt mountain side. Nest placed in artemesia 18" high and 6 inches down from top. Well hidden. 4 eggs. Bird left when within 4'. Return three hours later to collect the eggs and found her incubating. Located a nest of the Western Chipping Sparrow on a ridge exposure, north side of canyon on south exposure, in an artemesia flat surrounded by oak trees. Nest near top of bush and as I approached the bird left with much dfficulty. Approached within 3'. It flew directly to oak fringe and in 5 minutes returned to top of oaks and commenced to call. It remained in same place on oak tree for several minutes. Examined nest of Spurred Towhee. Placed under small but dense sage on hillside with rocks beneath. Nest well hidden and sheltered from sun. Nest sunk in ground and of dry bark shreds and grasses. Lined with dry grasses. 4 young about 3 or 4 day old. Bird flew into oak and gave warning notes. California Gulls in air and one could always see one or two in field of binoculars if directly skyward. Found a porcupine 30' up in large Cottonwood.

Brigham Young University

Provo, Utah

Whereas James William Bee has completed the prescribed course of instruction required for the honor, therefore the Brigham Young University upon the recommendation of the University Council and by virtue of the authority vested in the Board of Trustees hereby confers on him the degree of

Bachelor of Arts

with all the Rights, Privileges and Honors thereunto appertaining.
Dated the eighth day of June in the year of our Lord the nineteen hundred thirty-eighth and of the University the sixty-second

President of the Board of Trustees

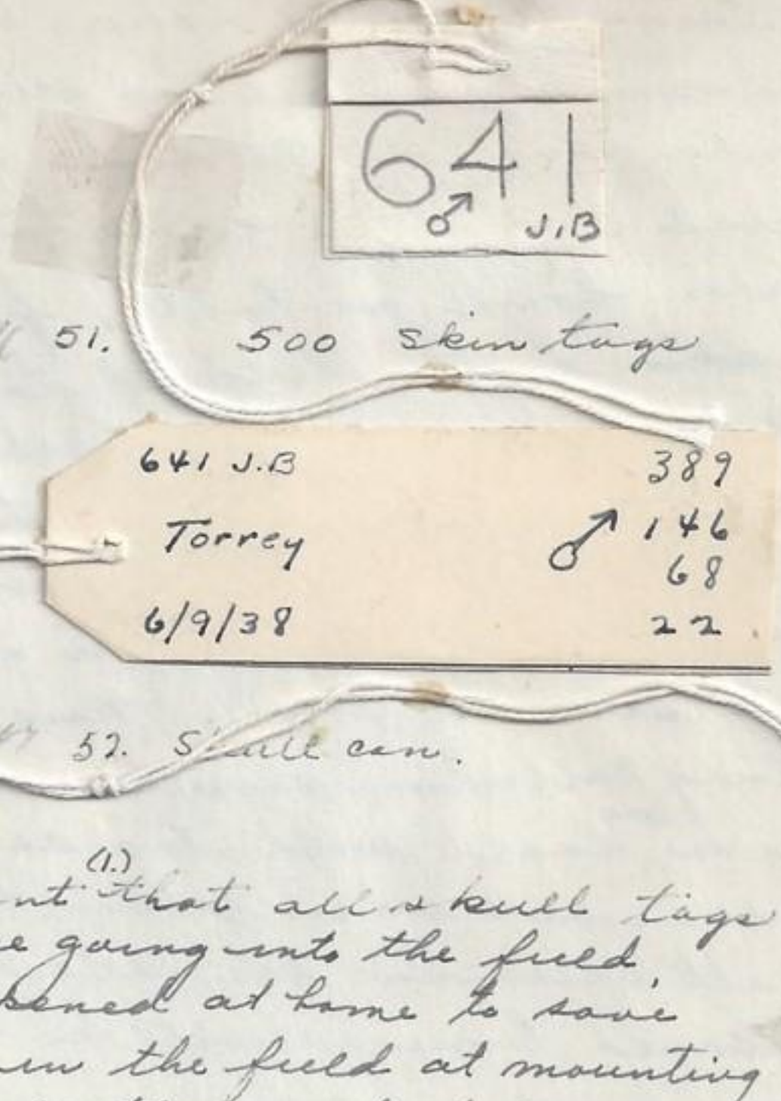
BRIGHAM YOUNG UNIVERSITY HOLINESS TO THE LORD PROVO CITY, UTAH

President of the University

[INSERT] 380609-106.1

43. 5H Pencil 50. 500 skull tags
44 Drying Box 20" x 12" x 24"
45 Packing trunk 3' x 2' x 1½'
46 Mosquito netting.
47. Wires,
2,000 no. 20 – 5" long
1,800 no. 18 – 8" long
300 no. 16 – 10" long
48. Mammal body tacks.
49. Traps,
Museum Specials
Rat traps
Gopher traps
no. 0. Steels.
Trap containers

50. 380609-107



51. 500 skin tags

53. Air seal can for mammal bodies

52. Skull can.

Essential Considerations.

I. I have found to be very important (1) that all skull tags and skin tags be threaded before going into the field. also all tail wires should be sharpened at home to save time in field, (2) to work 8 hours in the field at mounting mammals and birds one becomes restless and fatigued unless he is comfortable seated and chair is of right height. One must also have protection from winds that have a tendency to dry specimens and cause them to shrink slightly. Neatness of mounting job is proportional to seating & table facilities. (3) never use ink for skull tags. (4) oil cloth important as a precaution against dissemination of arsenic in food. also good hand brush, basin and soap. (5) roll mammal and bird bodies before going into field to economize on time. (6) Compact housing for skinning equipment make work more enjoyable and speeds up work considerably.

Required Technique. 1. The one thing that helped materially in the mounting of birds was the realization that the new cotton body was to fit the body and was not to be forced up into neck region. (2) use copious supply of corn meal for skins that have a tendency to cling on to body. for it assists in making better contact between fingers and skin that tends to be always slipping through fingers. (3) the general policy following in recording and found to be satisfactory in saving time was to set traps out in a certain area in the evening and after the setting describe the territory in a general way, then the following morning, with wrist pad, record very specifically the exact position of each trap and condition of trap as to whether it had not be visited, bait gone, trap sprung. If the trap holds a mammal, emphasize the immediate surroundings in descriptions & associations. With all trap on trap line, give trap number, condition of trap and if animal so caught name the animal and leave large oblong circle directly back of it as indicated.

14. Peromyscus [ ]. This reserved space is to be filled in when giving animal field number at camp. When in camp give animal field or collection number and record in separate book. When animal receives collection Number

and number is placed in separate book & field in field book, & the animal can be taken out of trap. Now the animal has field number which is duplicated in field book and collection number book. As soon as one returns to camp place all animals in traps near table for recording. Then place collection number book on table, field book directly right of collection book and skin tag and skull tag to right of collection number book. Now place one of the specimens in trap on table to left of collection number book. List it in C.N. book its locality, date and collector, It has received its collection number now & this number is then place in oblong circle in field book corresponding to same animal. Now fill in skin tags and skull tag indicating collection number and after taking specimen out of trap place on long board with tag associated with it. The specimens can be measured when giving collection number or can be measured after all specimens are recorded first. This method is systematic and saved time as well as eliminating possibility of error.

(4) Record observations as they are made. Do not put off until a shady spot turns up or leave until one return to camp. Notes made on the spot are the only scientific ones. Make deduction from notes and not in field.

Additional field equipment.

1. 410 Gun
2. Shells dust, 12 c., 9 c., 6 c.,
3. Binoculars.
4. Notebook holder with time & pencil attached. (second hand on watch)
5. Hard lead pencil (5H)
6. Thermometer
7. Collecting bag, blood cloths & cotton.
8. Camera & accessories.
9. Bird, reptile, mammal & gen. reference
10. Knife & matches.
11. Canteen.
12. Compass (Brunton.)
13. Bags.
14. Knee boots (rubber)

Camping equipment

Tent, stakes, ropes
axe
2 5 gal. cans
Bedding
Gasoline lamp, gas, mantle
Sleeping cot
Shovel
Chains for car.
Flashlight, extra batteries.
matches
Mirror
Baking coire
Gunny sack.
can opener
large fry pan
2 large stew kettles.
Dutch Oven
Dish pan
mixing spoon & pan.
pancake turner
water bucket
Knives, forks & spoons.
cups. saucepans.
Choe girl.
1 Butcher knife.
dish cloths & rags.

In the way of personal equipment advise plenty of good socks and above all take pair of knee boots for setting trap line in wet meadows and marshy situations. Good to include comb, razor blade, hand & laundry soap, mirror, tissue paper, sunex, first aid, towel and wash rag.

General itenerary and collecting stations.

Station 1	Fruita. Wayne Co.	June 9 — 16
Station 2	Torrey. Wayne Co.	June 16 — 18
Station 3	Steep Cr. Garfield Co.	June 18 — 23
Station 4		June 23 — 24
Station 3	Steep Cr. Garfield Co.	June 24 — 25
Station 4		June 25 — 26
Station 3	Steep Cr. Garfield Co	June 26 — 27
Station 5	Circle Cliffs, Garfield Co.	June 27 — 29
Station 3	Steep Cr. Garfield Co.	June 29 — 30
Station 6	Posy Lake. Garfield Co.	June 30 — 1
Station 7	Cyclone Lake. Gar. Co.,	July 1 —
Station 6	Posy Lake. Garfield Co.	July 1 — 3
Station 8	Mouth Calf Cr. Gar. Co.	July 3 — 5
	Bryce. Natl Park Kane & Gar. Co.	5 — 6
	Zion Natl Park Kane-Wash Co.	6 —
	St. George. Washington Co.	6 — 7
	Provo, Utah Co.	7

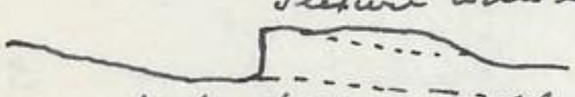
Observations and recordings.

mileage reading at Provo before leaving 12517
made early start and followed 91 to Nephi then over to 89 hence to Ephraim and Monte. Saw Citellus mollis mollis near Sterling, San Pete Co, for the first time since leaving Provo. They appeared to be very numerous and were seen running from one side of the highway to the other. Passed through Gunnison, Salina, Aurora and left Highway 89 at Sigurd. Turned off at Kosharem reservoir and followed road leading to Fish Lake turnoff. Gaining Awapa Plateau found a Crotalus viridis lutosus (?) on highway. It measured 880 m.m in length. From this point one looks to the east and south over an endless succession of rolling hills with good cover of sagebrush but lacking Juniper or Pinyon. To the west one looks down into Grass Valley far below.

380609 - 110

Four miles after leaving Legrand found Petrophis c. deserticola cola in road. Had been run over by a car but was still alive, so was preserved. Hail and rained intermittently across the Awapa Plateau with individual hail pellets measuring 7. m.m, and beginning at 2:00 P.M. Arrived at Torrey at 4:00 P.M and met Mr. Pedal. While passing through town saw R.S. Flicker, Sparrow Hawk, R. W. Blackbird, Bluebird and Say Phoebe. The mileage meter indicated that we had traveled 209 miles since we left Bravo. Arrived at Fruita and camped beneath large cottonwood tree just south of Dr. Ingleby home. Still sprinkling occasionally and things looked (like) unfavorable for good trapping tomite. It was the dreary type of rain and the prospects for a clear day tomorrow appeared doubtful. This was our last station.

Station no 1. At junction of Sulphur Creek with the Fremont river. At this point the Fremont river enters the water pocket fleture and is walled in both high sides and extremely rough appearing topography. The beds all dip to the east and north and differential erosion has produced a bold rock front that forms a cuesta like form with deep canyon cut into the area beyond the abrupt front. Before the river enters the cuesta front old elevated river terraces help to broaden & lend a touch that breaks the more rugged background.



The elevation at Fruita is 1.000 feet above the level of Salt Lake city.

Toward evening it rained with temperature 54° F after dark
Three Bufo woodhousii on ground at camp 300' from water, others heard calling both up the Fremont and down canyon toward narrows.
Set trap line tonight bordering Fremont river just east of camp. Here the cottonwood tree lined the border with squaw bush, boulder and an creeping vine dominating the vegetative covering. Toward the east rose the talus slope of the higher mountain. Circled a few minutes while setting traps.

Station 1 - 6/10/38
Temperature in morning still at 54° F Skies bright and clear.
Trap line of last night.

1. not visited. Place in black willow (?) squaw bush stream bank protected with cottonwood trees. 30' from water 20' from base of slope with massive cliffs above. A creeping vine entangled the tree growth and made it almost impenetrable. Sheep & cattle used this area considerable and ground pretty well eloped up. but looked like it might at least support a Peromyscus or two. Trap placed under protection of brush at edge.
2. not visited. Ibid.
3. not visited Ibid.
4. not visited Ibid.
5 not visited Ibid.
6. not visited. Ibid.
7. not visited Ibid.
8. not visited.
9. not visited.

↘ [note change of field number system for specimens] 380610-111

9— (650 J.B.) Pleasant. On talus slope above river bottom under protection of rock. Igneous and sandstone rocks comprised the hillside association with rabbitbrush between slope & river bottom. 60' from water 8' up hillside.

10. not visited. Slope of ig & S.S. boulders bordering wooded section of willow as above. No vegetation except shadescale (?) and a few sparse bunches of grass. Chrysothamnus fringed the contact between river valley and slope. Slope within 100' of truck and 100 from massive s. s. ledges above. near sheds & human habitation with dogs, pigs, sheep & cattle ranging frequently here.

11. not visited Ibid.
12. not visited Same as no 10
13. not visited " " "
14. not visited " " "
15. not visited " " "
16. not visited Under Artemesia.
17. not visited Same as no 10
18. Trap sprung " " "
19. not visited " " "
20 not visited
21. not visited
22 not visited
23. not visited
24 not visited

} traps generally placed by & under protection of rocks

} traps generally placed by or under protection of rocks.

George caught one Bufo woodhousii in trap along creek edge. He set along side of me but on creek edge while I work 20' back from edge and on hillside. The catch of last night will be of low percent annual catch.

Returned to camp and while eating breakfast a ♂ & ♀ Bullocks Oriole lit in cottonwood tree at camp. The ♀ seemed to be the more aggressive of the two and was followed by the ♂ in its feeding habits. When the ♀ flew from the tree, the ♂ followed closely. The orioles began to sing quite early in the morning, long before daylight.

Says Phoebe continuously calling at this time of day.

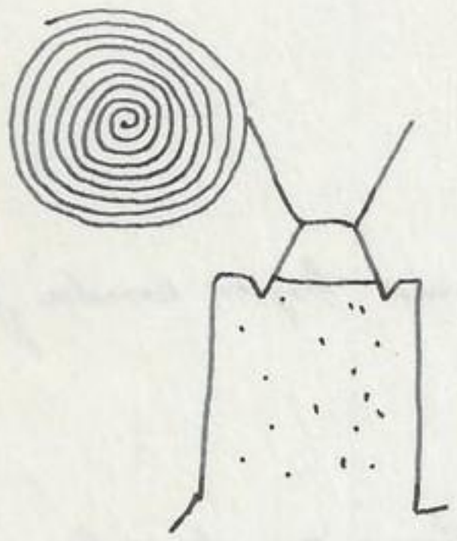
After breakfast George and I left camp to collect birds & animals Followed along the upper irregation canal on the west side of Tremont canyon starting in back of Chestnuts home. Followed to source of canal water then to last cultivated field in canyon just before narrows, hence deagonally up north hillside to top of plateaus, hence down slope toward Trenta & camp across igneous boulder and pasture bench land & then dropping from this elevated valley floor to camp again. Specific observations of above trip.

8:25 A.M. Left camp. While walking from camp to upper irregation canal saw the Robin, B. Oriole, yellow warbler, Says Phoebe, English Sparrow, and a Bufo woodhousii on rocky hillside but damp ground 100' from running water.

8:30 Swift flew by & G.T. Towhee seen in brush

8:45 Collected ♀ Goldfinch (652 J.B) along upper irregation canal. She had been calling and flying about the cottonwood & brush hillside

and when shot was picking up a feather for nesting material
This hillside above canal is a igneous boulder covered slope with
sparse vegetation except Ephedra. Below the canal is found a
damp soil with frequent wet places where water has seeped
from canal. This area is covered with squaw bush and willow
undense cover while cottonwood trees follow the canal edge.
Below the cultivated field are seen with fruit trees and grain
fields. with willow edge stream running by. not 200' from
where ♀ Goldfinch was collected, shot ♂ Goldfinch. (651 J.B).
Same situations as above and probably the mate to the
above. When not flying from willow to willow were seen
resting upon an old dead upper limb of a willow.



This petroglyph was found on igneous boulder
20' above upper canal and about 2 blocks
from mouth of Fremont Canyon up stream.

9:06 House Finch ♂
9:30 Collected A. Throated Swift (654 J.B)
flying along side hill at mouth of canyon
9:45 Lazuli Bunting ♂ flew by in willows
bordering creek. Bird others seen. ♂ singing on willow top.
10:00 Approached first cultivated field
at mouth of Fremont Canyon. Two adult
marmots feeding in open field but left
immediately. Had family of young about
one half size of parent, home at edge
of field in rock pile. Parents 200' from
home. At this point the Moenkopi forms the canyon sides and
follows up canyon but gradually being replaced by the old. Kaibab
limestone (?) as one follows up canyon.
9:25 Gnatcatcher. Chipping on top of dry pinyon tree. Continued
its course and flew from the to tree chipping as it worked itself
along the mountain side. (653 J.B.)
at the edge of the creek on valley floor measured an Artemesia
tridentata that was 12' high. The canyon wall are now becoming
higher & more rugged appearing.
10:35 Watched adult rock wren feeding young about the same size as
parent bird. She was feeding one a red grasshopper on top of a large
boulder. Both birds calling. Swallowtail butterflies, Mourning Cloaks
and Cicada were frequently seen or heard.
10:45 Two gnatcatchers, one with worm in mouth to be fed to young
The birds were feeding & working along on tops of Juniper & Pinyon trees
at base of hill.
10:50 2 mourning doves flew by together.
11:00 Leaving the canyon at the narrows and working diagonally up
hillside to gain top of sloping plateau. When about 200' up hot dry hill-
side saw Hummingbird just as it worked itself into hole under rock. Juniper
& Pinyon is dominant vegetation with sh. and round igneous boulder
strewn upon the sidehill

11:25 Could hear & see Pinyon Jays on opposite side of canyon feeding in the Pinyon and Juniper trees.
About half way up hillside came to a level inwhich all the round black igneous rocks ended abruptly. Looked up & down canyon on this same level and found it to represent a common level. Could follow this horizontal level up canyon and down canyon. When the horizontal level met at mouth of canyon it continued as a flat bench. No igneous boulders were found above this level while below it the hillside was strewn with them. On closer examination found that this level was traceable on all sides of valley & canyons evening far down the Fremont river where it cuts its channel through the fleture. It represents an accumulation of river worn boulder that has been deposited upon an old valley floor level but now are above the present valley level as elevated floor levels.
The boulder now found on the present valley floor have percolated down from above as the alder, less resistant s.s. strata below has been eroded away. These boulders could have come down from the aquarius source. & these found at this point have likely sent down through the Fremont river channel or have been backed up into canyon from the sulphur creek source.
Finally worked way to top & down across sloping plateau to bench level of black boulder. No annual life on plateau but nice slopes of Pinyon & Juniper.
Examined one or two likely dipodomys holes in sandy areas on top of bench but not indication of recent workings. Before leaving camp this morning the skies were clear but after few minutes on trail dark clouds appeared on distant horizon. They increased until at 12:00 it started to rain and lasted 20 minutes.
Followed to the last to edge of bench directly above camp.
Descended about 1:00. - Sceloporus and Crenadophorus very numerous on trip especially above canal on upper hillside. Birds concentrated along canal.
Prepared specimens in the afternoon until time for trap line set.

652 J.B
L. 10
W. 8½
T. 4
B.
T. 1¼ ♀ destroyed skin
F. 1½

653 J.B
L. 10
W. 6
T 5½
destroyed skin.

Set trap line this evening in talus slope habitat east of school house at Fruita and N. A. from Dr. Ingelsby Home. This talus slope lies at base of Wingate formation. The Wingate and Todilto formations are perpendicular and present a bold front of possibly 300' or 400' high and are responsible for the large sandstone boulder accumulation lying upon the Chinle directly below. The Chinle slope controls the repose of the talus for the large boulders & sandstone blocks lie directly upon it rather than represent a deep accumulation of debris of the Wingate with a great depth,

That is there is no deep recesses or chasm interspersed among the block of sandstone as is generally found associated with a talus slope made up of large boulders. The jointing system of the Kingate has been very favorable for producing large blocks and as these are exfoliated they come to rest upon the Chinle slope below. Some of these blocks are as large as 4 cars. They range in size from these mammoth sections to small boulders a few inches in diameter, however the slope is dominantly an accumulation of the new looking, larger blocks. In some places the basal Chinle is expose to indicate the surficial talus. Under the rocks and in honeycombed pocket on the surface of the boulder so found a loess or fine dust. These protected places are favorable pack rat runs and by the numerous tracks & trails would suppose that the talus was heavily populated. The numerous nest of the neotoma would indicate that this area was extensively used. At a distance the slope appeared to be destitute of vegetation. but when upon closer examination found a Artemesia, Ephedra, bunch grasses and another small brush taking on the appearance of the sage, sparsely covering the slope and mainly represented by lone & isolated plants. While the slope proper was lacking in any amount of vegetation, the valley floor level that was being farmed supported several farm products and grains. This cultivated section is adjacent to bottom of talus. One very interesting thing about this area was the numerous fruit seeds and shells found among the rocks. Peach stones entire and sectioned, walnut shells, prune shells, & apricot stones were found principally near the homes and on the trails of the rats. Several corn cobs were located, some charded completely through others fresh looking, the chard ones probably coming from some prehistoric Indian site. Already two peach trees had taken root and were about 10" high and were about 10' from base of Kingate at top of talus which meant that these seeds were carried about 500' from their original source. Dried grasses were generally found in bunches under the rock and near their nests. Cherry tree grew on flats below and were accessible to rats at 50' from base of slope. Two Cotamis were seen running up and over the rocks, stopping occasionally to look back or scratch head. From these actions, while seen at some distance however, would indicate that they were possibly E. d. utahensis Flicker flew into crevice in Kingate and being quite late when observation was made would seem to indicate that it was there to roost because I failed to see it leave again. White-throated swifts were seen to be flying in and out of crevice in the upper Kingate for inspection. In making our descent observed the nighthawk flying about 4 feet and less over a igneous boulder covered field in bottom of canyon. It seemed fearless and flew by within arms reach several times. Made a close examination for eggs & young but found nothing. Two Scelophorus in evidence. Returned to camp just in time for supper and then bed.

Station 1 — 6/11/38

Returns of trap line of last nites setting. Had traps and specimens in shortly after sun up.

Rat traps

1. not visited all traps on talus slope.
2. not visited
3. not visited
4. Bait gone but trap not sprung
5. not visited
6. Sprung
7. Bait gone but trap not sprung
8. " " " " " "
9. Bait gone " " " "
10. (655) J.B. Neotoma. Caught at entrance of hole under protection of boulder.

Specials museum

11. Bait gone
12. not visited
1-7 not visited
8. Eutamias
9. not visited
10 " "
11 " "
12 " "
13 Eutamias tail only.
14. Bait gone.
16. Bait gone
17. (657 J.B) Peromyscus.
18. not visited
19 Bait gone
20 not visited.
21 not visited
24. " "
25 " "
26 " "

Soon had these specimens prepared after returning to camp and after lunch set out with gun and traps. Planned to set traps on east bench and to collect specimens to compensate for terrible catch of this morning. George Beck Nelmer ✓ nupely made trip with Nelmer shouldering gun. General itinerary included trip across bench, down to Cohala canyon ~~and~~ to tank canyon leading to small natural bridge and capped fissidele.

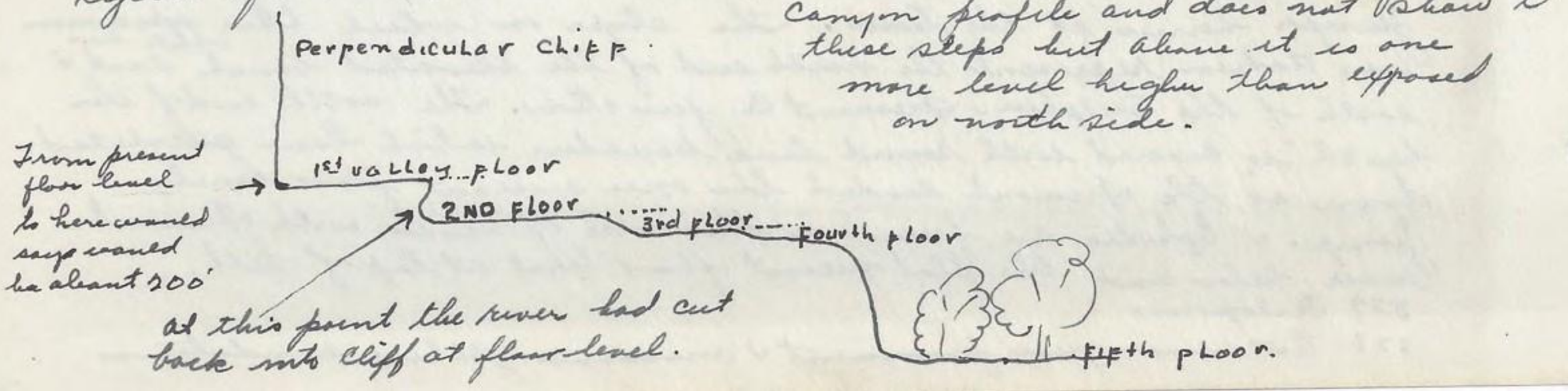
Left camp at 3:05. Quail calling and one seen setting in top of willow tree bordering stream near junction of Sulphur Creek and Fremont. Temperature. over cast skies,

3:15 Two Sceloporus
3:20 Cuckets calling continuously along course.
3:21 Chipmunk ran up hill over boulder covered hillside jumping from rock to rock. It was hard to approach but stopped frequently to look back. Found from the N. E.
3:25 (661) Collected above Eutamias. It was eating juniper berries at the time. The slope on which this specimen was taken represent the north end of the elevated bench which last & south of the Sulpher - Fremont Cr. junction. The north end of this bench is covered with round lava boulders which have pedestaled down as the Fremont eroded the once ancient flat level. Juniper & Ephedra are found on this side of bench. with Fremont river below and the flat ancient floor label at top of hill.
3:27 Sceloporus
328. Eutamias near prominent & massive yellow sandstone

38061 I-116

on north end of platform near top of bench. Stepped on large boulder 50' away for several minutes then ran up hill. Collected (660)
3:32 Now at Chinle - Wingate contact on north side of elevated floor level. Examined pack rat nest in rocks at base of cliff just below rim of bench. Juniper berries, Ephedra stems, juniper stems, grass seed heads, winter fat leaves and some other type of succulent leaves were scattered around peripheral edge of home of dried sticks.
3:30 Arrived on top of bench which at this point is 20' above Wingate. Chinle contact. Slight wind on rim help to decrease annoyance of black gnats which were always getting in ears. Junipers & pinyon seemed to dominate tree growth and covered certain areas of the more or less flat top. also a sagebrush type of plant and numerous Ephedra. From this point could see two chipmunks on rock below along the Fremont River. This elevated bench has some very impressive geological features that are evident from whatever position one might hold in the canyon. It represents the old floor level of the Fremont & Sulphur Creek thousands of years ago. Upon this ancient floor level has been deposited a layer of round, large & small igneous boulder which have been carried down by floods or water from the base of the aquarius to the west. These boulders have arrived in recent times geologically speaking and have passed from the larger canyons that were already formed before their arrival such as the Fremont, Sulphur Creek, Pleasant Creek etc. This is borne out by the fact that in the canyons and on the sides of the more open valleys the boulders stop at a certain elevation above which none is to be found. Since the time the boulders were deposited upon a more or less broad field high above the creek junction here, the present creeks have eroded down through to their present level and have left the original floor level stranded high upon the hillsides. We are now upon this ancient floor level looking down into the canyon to the north that has been eroded away since. However on looking to the N. E. at a point where the Fremont enters the Reef with perpendicular walls on each side one can see that the erosional cycles since the time of this old floor level have been catastrophic and timely intermittent. The exposure of the north walls present such a erosional pattern showing the successive cycles of erosion.

The bench is on the south side of this canyon profile and does not show these steps but above it is one more level higher than opposed on north side.



To the west from here looking across the Fremont one can see a large bench which takes up most of the valley at Fruita. It is the same level as our position and is seen to carry up into Fremont Canyon and up Sulphur Creek. On the very edge of this bench is preserved the first cycle of erosion and on its flow is preserved the original creek bed (?). In general one can expect to find black igneous boulder in canyons below the level of this bench line but nothing above. This same bench line carried down the Fremont river through the reef and is modified & irregular but still preserved upon the canyon walls. The boulder accumulations are all superficial and are deposited upon foundation material being Moenkopie under point just south of Ingelshys home at the junction. This explanation is in contradiction to the theory that the boulder fields are merely residual matter from a igneous flow that at one time covered the above platiau that has since eroded away. These rocks were supposed to have percolated down through as the less resistent layers of the Cretaceous, Eocene, and Jurassic were eroded away. It appears to me however that the common source of these rock are from the present aquarius and are absolutely foreign to this point at Fruita.

4:35 At the most N. Easterly point of bench with perpendicular Wingate to east and the fremont river hundreds of feet directly below. One can not descend into canyon from this point. Nice view of valley below to the west. Gnats still very annoying. Will now work along base of cliff to the south with the purpose of finding favorable deposits of habitats on sand dunes situated on this elevated level at base of cliffs.

4:36 Utta

4:37 Utta, Utta.

4:40 On this bench the Juniper and Pinyon trees are distributed on a 50% basis that is 1/2 of the tree growth is of Juniper while the other half is of pinyon. In examining the cones of the pinyon found the nuts were just developing and the the shell of the seed could not be detected.

4:240 Cottontails ran up wash at base of cliffs and did not pause. The water that falls from the face of these Wingate cliffs forms a gulch at the base which carries the water along a parallel course to edge of bench boarding the Fremont river. Cottontail tracks seen in sand, no other evidence. Mr. Chestnut of Fruita told me that frequently several men would drive this bench from the south to the north where the Jacks became ledge and shat. Did not see any evidence of the Jacks upon this bench.

380611-118

5:05 Six inch Sceloporus on sandstone boulder near base of perpendicular cliff.

5:10 Arrived at south end of plateau at base of trail leading up to head of Cohab Canyon.

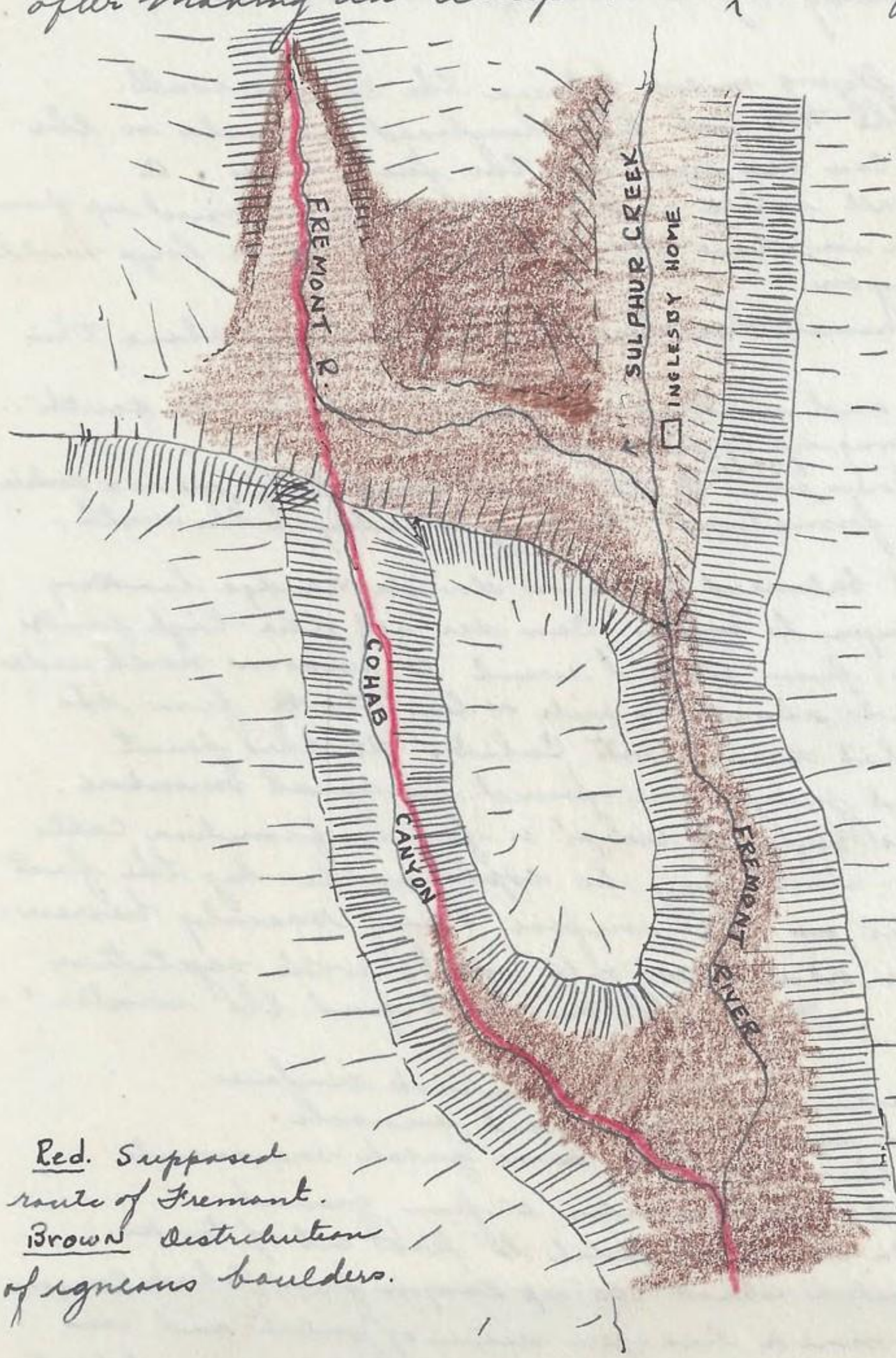
Set trap line of Museum Specials about 300' north of the base of Cohab Canyon trail on sand dunes lying about 100' from base of perpendicular Navajo Cliff. A few of these sand patches are now moving slightly and are surfaced with sand ripple marks. The sand dreas in the main however ha been checked and are now dormant. This dune area waned about against the cliff if were not for the rains which keeps a small gully between the two. Juniper Pinyon + Ephedra and other minor plants are found growing here. Set the 17 traps along a course of about 200' mainly in the entrances of Dipodomys holes.

5:11 Watched rock wren feeding on a pinyon cone. When we first approached the south edge of the bench we run into a small congregation of birds. Collected a Baeolophus ornatus griseus feeding in top of pinyon tree with three others. They were offering calls which sounded much like the chickadee. When this one was shot they ceased calling for a second or two, flew 20' into another tree and began to chip. They did not sense the fear of the gun report like other birds do. It appears as if birds in congregation are more fearless than single birds. Collected second one (663) J.B. in top of pinyon which was one of the group. Two others flew 150' down across gulch and into pinyon tree. One of the two remaining was collected when followed up while the last one was lost as it worked around the hill. While under all this fire two Psaltriparus m. plumbeus [this species maybe Polioptila caerulea] worked up gulch intercepting the Baeolophus and the gunman. They fled from one tree to the other and progressively worked up wash to top of bench whence they disapeared. They called called continuously as the proceeded past us in review. The rock wren had family of young ones above ~~rocks~~ trails in larger rocks

5:25. Starting up trail to head of Cohab Canyon. It crosses the Chinle formation the entire length until it approaches the pass. Set a few traps along this trail at the edges of boulders on the talus and at contact between Chinle + Navajo which acted as a runway because of the perpendicular walled barrier.

5:35 Arrived at pass. This canyon is rather peculiar in that it has a wide entrance at the head. The same width of the canyon is represented here as is found farther down. Certainly not enough rain could have collected at the very head of this canyon to have produced such a wide entrance. Possibly it was at one time the outlet of the Fremont river and since the time it flowed directly east from the the east trend now has been deflected to the north + joined Sulphur Creek. The forces that are responsible for the [illegible] erasional work may work a little different

than are evident today. Most erosion, it appears to me is done during a very short period of time when we receive cloudburst rains or storms of cloudburst proportions. Now if a present canyon has a favorable catchment basin yet supports very little water in its creek bed, may have greater erosional possibilities than a canyon supporting a large stream but not having the proper pattern of catchment basin necessary to support cloudburst floods. This seems to be the case with Sulphur & Fremont canyons; one supporting nearly all the water but with narrow canyon while the other has very little permanent flow but having the widest canyon and suffers the greatest degree of erosion. It appears to me that Sulphur creek has sapped the Fremont which now enters the reef proper after making an abrupt turn to the north from its east west trend.



Red. Supposed route of Fremont.
Brown distribution of igneous boulders.

Another interesting thing is connected with this Cohab Canyon is the distribution of igneous boulders. They are found at the lower end but not at the head of the Canyon. This would indicate that if the Fremont had gone down this Canyon at one time it was before the deposit of boulder took place and that the Fremont had been diverted before the invasion of block boulders. The boulders in lower Cohab gained entrance by backing up into mouth of canyon from the present Fremont river at a point in the east portion of the reef.

380611-120

5:35 Canyon wren calling in Cadenzas. about 100' down Cohab Canyon from pass.

5:46 Collected Eutamias quadrivittatus hopiensis. 659 J.B in canyon floor. Was first seen when it scurried into squawbush protection. The canyon floor ~~bed is~~ of Cohab is from say 100' to 55' wide and filled in with sands and stratified deposits. An erosional cut of from 1' to 4' deep is evident at several sections. Juniper, Pinyon, Squawbush and other bushes of same size are found growing here, with Chrysothamnus & fair growth of grasses. The walls are steep & entirely devoid of vegetation except above where they flatten out and the Juniper & Pinyon begin to take their stand. The old floor of the canyon is gradually being eaten by the erosional intermittent stream. At many points the vegetation & tree roots were exposed for a depth of 3' or 4' and many were subsisting by a mere small root contact upon its eroded sides.

5:50 A small bat was flying in air between the canyon wall. Canyon now trending to the N.E and high headed pinnacles on the north side of the Fremont can be seen for the first time. a chipmunk run up canyon wall while another (hopiensis) scurried up from the canyon floor. Another in same group stopped at 80 on large boulder a moment before moving on.

5:50 First evidence of igneous boulders. Did not see any above this point.

5:56 Leaving canyon floor and working up canyon wall to the south. Saw lizard after while working up Canyon side

6:00 Dark colored Sceloporus, 2" long on a light colored sandstone, one on a darker colored Silicified wood in Todilto formation. Working steadily to the south.

6:25 Sceloporus.

6:28 Arrived at prominent balanced rock on divide & ridge looking down into large deep canyon to south. Can see all the high peaks in a panoramic sweep, from Grand wash to peaks on north side of Fremont. This rock is about 1/2 mile or less S.S.E. from the mouth of Tanks Canyon that drains into Cohab. At this point the mahogany, pinyon and juniper are found in equal numbers. Surprising but found no bird life except a few unfamiliar calls and only a few lizards. This may be explainable by the fact that there is little soil, the surface being mainly barren. The Junipers & Pinyon are about 20' or 15' apart with vegetation practically null between. Frequently one will find the winter fat interfacing.

7:05 Eutamias on upper area on flat barren rock surfaces. Stopped at natural bridge west of prominent pinnacle. 300' below the bridge to the north & in same gulch measured Juniper tree which was 33" in diameter 3' from ground. From here bore to the north, down the gulch to first set of tanks. a series of tanks lay in gulch about 200' up canyon from Cohab canyon. The upper most one is in more or less open section of gulch and was supporting water about 1 1/2 foot deep 5' long & 2' wide. The series of 4 or 5 below this one are in very deep & narrow water cut gulch. but can be traversed.

These tanks supported mosquito larva in great numbers while the upper tank, in addition to the larva had a string of toad eggs.

7:30 Back to Cohab Canyon and collected Citellus grammurus grammurus. (658 J.13) where lateral tanks canyon enters main Cohab canyon. Was collected on its way to rock accumulation above canyon floor and barren sidehill of solid rock of red and white sandstone. 200' from tanks. The ectoparasites certainly could not have been more densely population per sq. inch of hair than found upon this animal. All fleas.

7:32 Bat in canyon collected at same point as seen on trip at 5:50 flying in canyon proper (668 J.B)

7:50 Back at pass with canyon wren still calling in same location. Seems rather peculiar to find canyon wren on east side of pass with family of young rock wrens on west side of pass.

8:05 Camp. Bats flying around camp. Had supper, gutted animals and birds, baked with Ingleby & tobed.

* Station 1 6/12/38 Fruita.

After breakfast left for trap line of woods and steel on talus slope trapped the nite before. Left the trap line set yesterday morning and traps in same position. In crossing Sulphur Creek this morning found the small flow of water even lower than when observed yesterday at this same time. Skies overcast with cool breeze. Phoebe, hawk (?) Grasbeak, yellow warbler and song sparrow singing along river. A Sceloporus was seen on school grounds. Beginning trap line starting at base of talus and working diagonally up across talus to the west.

1. S. not visited
2. S " "
3. S " "
4. S " "
5. S " "
6. S Bait gone
1. N. not visited
2. N. Bat gone
3. N. Eutamias quadrivittatus hopiensis (666 J.B) Caught in rat runway. It had small seeds in mouth. ♀. From beat could see marmot den 20' from bottom of talus. The den was at edge of talus with cultivated fields beyond. Two young marmot watched me for a few seconds, then called & disappeared.
4. Bait gone
5. Sprung & bait gone. Peromyscus tracks on trap. Cool canyon breeze up. Canyon.
6. Bait gone (George picked up an antelope chipmunk here)
7. Peromyscus caught by tail and released.

Left these traps in same position and return to camp then went to top of bench for specials sets last nite after breakfast. Left at 9:45 A.M. with Wilmer handling the gun. Crossing the creek saw a Cnemidophorus on sand in creek bed. Collected a Eutamias quadrivittatus hopiensis (669) on north end of bench about half way up on boulder strewn sidehill and very little vegetation. It was first seen running up hill. It stopped for 90" on rocks at 90' away. Held green grass in mouth. 10:00 Large Cnemidophorus soon hid itself in black igneous boulders.
10:06 Wilm, rock singing.

10:14 Ute at base of Nugate. Chinle Contact.
10:15 On top of bench. The wind was heard and seen blowing on river bottom below but was quiet here on top.
10:17 Psaltriparus minimus plumbeus feeding on juniper tree and calling as it fed. Several dipodomy holes were seen on the moving sands but no recent activity. It would appear to me that possibly these forms were in aestivation.

Trap line returns.

All these traps were placed at the entrances of the dipodomy holes in sandy areas. Cedars and junipers covered dunes.

1. Bait gone, trap set on sand dune in trail leading across sand. House finch chirping.
2. Not visited. Glued in hole at base of Ephedra growing on sands.
3. Immature Sacks Kat. Caught at entrance of hole in sand. It was caught in such a position as to indicate that it was leaving and not entering. Hole at base of Ephedra on dune among Junipers. Was 60' from the cliffs.
4. Mouth of Ephedra among pinepe & pinyon. not visited. male Psaltriparus m. plumbeus feeding along base of cliffs in junipers.
5. Sprung. at hole under large rock probably Neotoma. Sandy situation.
6. Bait gone. Base of large boulder near cliff and 10' from pack rat home. Psaltriparus m. plumbeus feeding & calling in pinyon 20' away and at base of cliff at south end of bench.
   10:38 Eutamias ran up trail 150' ahead to hole in rock.
7. Sprung & bait gone. Talus of perpendicular cliffs.
8. B. gone.
9. Trap gone.
10. Not visited. Edge of rock in talus slope.
11. not visited " " " " " "
12. " " " " " " near hole.
13. Sprung Rat dune on top of trap.
14. Sprung.
15. Sprung. on trail at base of Nugate.
16. Sprung on annual trail at base of Nugate-Chinle Contact.
17. " " " " " " " "

These last 4 traps were evidently tripped by Neotoma.
Arrived at pass of Cohab Canyon at 10:45. The skies were 50% clear and 50% clouded. Can see Catellus leucurus leucurus on flat below at base of talus slope. The Hame Finch & Rock Wren were singing at this point. Returning now down trail to bench and wood in Chinle formation (intact.)
arrived at the west brink of bench at 10:55. Cruckels callings. Camp at 11:00 and immediately started on preparing our material.

(660 J.B.) Eutamias. Immature and destroyed

length	185 m.m.
tail	86 m.m.
foot	30.5 m.m.
gram wt.	30.

(667 J.B.) Neotoma l.m. Immature and destroyed. ♀

length	243 m.m.
tail	106 m.m
foot	28 m.m.
gram wt.	75

(665 J.B) Peromyscus. Skull only.

length 165 m.m.
tail 87 m.m ♂
foot 21.5 m.m.
gram wt 16

(662 J.B) Baiomys inornatus griseus.

length 132 m.m.
tail 58 m.m
wing 70 m.m.
Tarsus 24 m.m.
Toe 13.3 m.m.
gram wt. 15.

After preparing material jumped in car and drove down to Dawdling Castle for a little reconnaissance trip around to the back of it. Left camp at Fruita junction ~~at~~ with the mileage indicator at 30.4 and on arrival at mouth of Canyon leading back to the east of the castle ~~at~~ the mileage indicated that we had come 1 mile and 2 blocks. The Moenkopi here is highly gypsiferous and beautifully exposed. on the left side of Canyon. Took picture of this area several days later and shows the prominent Moenkopi on left side with the rest of the series in the background. The dotted profile on skyline is Navaho and smooth perpendicular face lies the Todilto which here is differentiated by its more prominent bedding planes. On the right hand side of picture the talus slope at base of perpendicular Wingate is Chinle. with its lower levels of variegated blues, greens and greys. The Moenkopi dips to the north east and is quite evident in picture.

We went up this Canyon & turned west at a point where sun is intercepted by cloud shadow. Dawdling castle lies N. W from this point where picture was taken. and casts its evening shadow upon the opposite Wingate Cliff on the extreme right hand side of the picture.



1-6-11-38

At 5:30 Could see and hear a nighthawk flying around the Castle 6:00 Two Say Phoebes in main Canyon flying from one Chrysothamnus to another. Left main canyon & gained top of one of the erosional remnants of the Chinle to the left where we found a balanced rock being supported by Chinle formation. The rock dipped strongly to the north and had come to rest upon the older surface of the Chinle from a stratum higher in the Chinle succession. The greenish Chinle here is highly impregnated with silicified trees mainly fragments but one measuring six feet long. The erosional sides of these rounded Chinle formations are at a gravitational repose and to slide down



upon the coarse trail gives one the sensation of skiing. While it offered a little amusement at the time should never be allowed because it defaces a surface that is beautiful to look at and a surface that should be left unscarred by these parallel tracks. A good policy would be to bring trail out on some vantage point above to view these interesting crossonal hills and require people to remain on trails because if they are allowed to traverse these areas and plow the surface for a thrill, much of the enhancing beauty of the area will be destroyed.

6:05 Rock Area. Tree 4 feet in diameter in red formation in Chinle. about 40' up hillside from main canyon. As we progressively hikes up this creek bed in canyon he finds that silicified wood become more evident. First fragments are found near mouth of canyon, then small section and occasional trunk and when near head of blind Gulch with a barrier in creek bed one finds numerous trunk sections. from 1' to 2' or so in diameter. and all coming from the Chinle source.

6:30 Head of main Canyon east of Castle and stopped temporarily by wall barrier on all sides. From this baked condition worked diagonally up west hillside and on top. Now the Castle lies to the S. W of us. a short distance west of us lies a small balanced rock.

6:45. Lizard. Bats flying on east side of castle.

7:00 From our position on ridge running east from base of Castle can view the picturesque foot hills below. They are constituted of the Moenkopi and Chinle formations. the Moenkopi being a delicate chocolate red while the Chinle a variegated but predominately a light greenish blue. Erosion has softly carved out the Chinle into a succession of rolling hills and to descend down their ridge tops remind one of walking over the irregularities of some giant feather pillow. One noticeable feature is the mammoth ant hills appearance of some of the found hill tops. Here the strata are exposed on same level on all sides of the dome. Throughout our entire descent down the S. E. slopes we found chip piles upon the Chinle indicating the remnant of trees that have become deteriorated on exposure & have fragmented into thousands of small pieces. These surface finds were more whitish in color and were not so highly silicified or at least as opaque as the other trees found in gulch to the east. One area of chips was about 15' wide and extended down hill for 30' or more. Most of the wood was found between the resistent red layer at about the middle of the Chinle, down to the Moenkopi. This section is mainly of the light colored material of greenish-blue calcareous shale and conglomeritic sandstones (?)

7:25 Two small bats flew by.

6:30 mouth of Canyon where we left car. Several bats were flying along walls of the prominent Moenkopi formation here.

Arrived at camp at Fruita and left for woods & steel trap line on talus across creek above school house. Took Museum Specials to set along with Woods & Steels. The larger traps have been kept in some position for the last two days and are now checking on the results of the trap. They were reset this morning and left during the day in hopes of getting a few Eutamias and to check on the diurnal activity of the Neotoma and other nocturnal forms. Lizard active & crickets calling.

Traps.

1. Bait gone
2. " "
3. " "
4. " "
5. " "
6. " "
7. " "
8. " "
9. " "
10. " "
11. " "

It would appear quite unusual to find all bait gone and not traps sprung. Have a lurking suspicion that the insects have been the guilty ones for on several instances noted beetle tracks and ants on traps. It also shows that the Eutamias miss several points on the talus slopes during their days jaunts. These traps are set diagonally up talus to the west, starting from school property to the three largest and most conspicuous rocks to the west and about 1/2 way up talus. Decided to set the Specials on the contact zone between the base of the talus and the cultivated field on the valley floor. Was particularly interested in finding out the degree this contact between habitats was being used as a trail way and to see whether pack rats crossed this zone to invade the cultivated fields and use cover for the animals living in the fields & river bottom. George set his series of 20 traps and I set my series of about 25 at the edges of boulders on this abrupt contact zone. All sets made in 200' linear line and traps averaged a little under 4' apart. Rock wren singing on talus. Toads singing up. Tremont and the crickets increasing the volume and number of their calls. Measured boulder on School grounds at base of talus which measured 10'x20'. By now, after completing our trap line, the moon was just coming up over the east skyline. On way back to camp picked up 2 Bufo woodhousii along creek. The water in the creek was the lowest we had experienced yet, its channel being about 5-6' wide and possibly 2" deep. The moonlight upon the Wingate formation subdues their reasoneness & apparent height but still retains the red color in a most unusual & delicate tone. After supper was over we had the opportunity to talk to Clarence Chesnut concerning a few of his personal observations. He lives here at Fruita and knows the country fairly well. While sitting around the camp fire I recorded several things that were mentioned during the conversation. He reported these observations.

Ringtail occasionally seen.
The Gray fox is the most common fox.
Swift and Red Fox present. (There appears to be a possibility that there could be a little confusion in their identification)

380612-125

The weasel were seen now and then but mostly in winter time.

mt. sheep in the Rockies south of the Henrys. One killed 5 years ago had 18" horns.

He knew of no Badger here at Fruita but reports them occurring between Notom and the Fremont river on east side of Capitol Reef.

Few cats present

Grey wolf in Henry at one time. would kill cattle daily and a reward was offered for its capture.

no black bear here but are found on Aquarius.

Few Jacks rabbits and cottontails. He has not seen Jacks for long time. mainly found on black bench above.

Jay and squirrels carry walnuts to upper ledges.

Few kahgaroo rats.

Few scattered blawsnakes.

Rarely find the rattlesnake.

He also reports some general information that I recorded.

Six miles down Fremont river from the point where it enters reef. one finds a large grove of cottonwood trees.

They have lots of snow but it doesn't remain upon the ground because the rocks & ledge act like ovens. Even in winter one can get a sun bath under a ledge regardless of the temperature of the day. Around new years it was foggy at Richfield but not here. It seldom get foggy here and when fog clouds appear are generally restricted to the top of the ledges. Frequently the temperature goes down to zero but not much beyond. Apricots bloom in March. Cherries are nearly ripe. (6/12/38). The country between the mayor walsh ~~as~~ is about the same in topographical effession. Five hour trip from Fruita to Torrey by way of the Fremont River. Calcite crystals 12 miles from here, one goes down Fremont then turns north. no road into this area. From Fruita it requires 3 days to go into the circle cliffs. and at $.50 per horse per day. Water 1 mile down Indian gulch after arriving at bottom. One will find an irrigation ditch in Indian gulch which will indicate the point to leave the gulch & head to the east. Two methods are followed in trapping coyotes; one to place red flag in open field to attract attention & the other is to bury an alarm clock near trap.

10:40 P.M. Cool wind down canyon, clear skies, full moon. After being entertained by Clarence for the last two hours we hit Fruita & hit the hay.

* Station 1. 6/13/38. Fruita.

7:45 A.M. Day Clear, cool, few clouds, temperature 59° F
After breakfast left for trap line on talus slope at school house location

On trail to trap line saw one mourning dove, house finch, heard Oriole, saw English Sparrow, Says Phoebe, Yellow Warbler + Song Sparrow. along river bed while a Eutamias was calling vigorously from his station on a rock in the talus slope above the school house.

Trap returns.

Stable.

1. W. Not visited
2 w. " "
3 w. " "
4 w. Bait gone.
5 w. (671 JB) Neotoma lepida monatanabilis caught going into hole under large boulder and near home. About 100' up talus slope from valley floor. then disappeared.
6. w. Bait gone. (young mammals calling from den below)
1. S. Bait gone.
2. S. Bait gone
3. S. (670 J.B) Neotoma lepida monatanabilis. Caught in open runway near home of sticks.
4. S. Bait gone (Ute officiating while clinging on to perpendicular rock. Pellet ⬭ this shape + size.
5 S. Bait gone.
6. S. Bait gone
7. S. Bait gone

Museum Specials.

1. m. not visited
2. m. " "
3. m. " "
4. m " "
5. m " "
6. m " "
7. m " "
8. m " "
9. m (672 J. B) Eutamias quadrivittatus hopiensis. Among large rocks.
10. Sprung but bait remaining
11. not visited
12 " "
13 " "
14 " "
15 " "
16 " "
17. " " (Ute)
18. (673 J.B) Eutamias quadrivittatus hopiensis.
19. not visited
20. " "
21. Sprung but bait remaining
22. not visited
24 " "
25 " " (2 Ute)

George reports no mammals in his extension of museum traps in same Contact Zone. Pulled up all traps in talus habitat and returned to camp at 8:40 to prepare material.

9:15 Clouds in sky. Temperature 65° F.

Last nite Dr. Beck shot two nighthawks at camp about 7:45 flying over + along Fremont river. Two others were flying with them. The stomachs of these two birds contained the following:

380613-127

Stomach analysis of nighthawk ♂ (Coll. no 9 of George Cannon)

Ichneumonidae
Elyateridae
Cahabidae
Scarabidae
miridae
Formicidae
Diptera

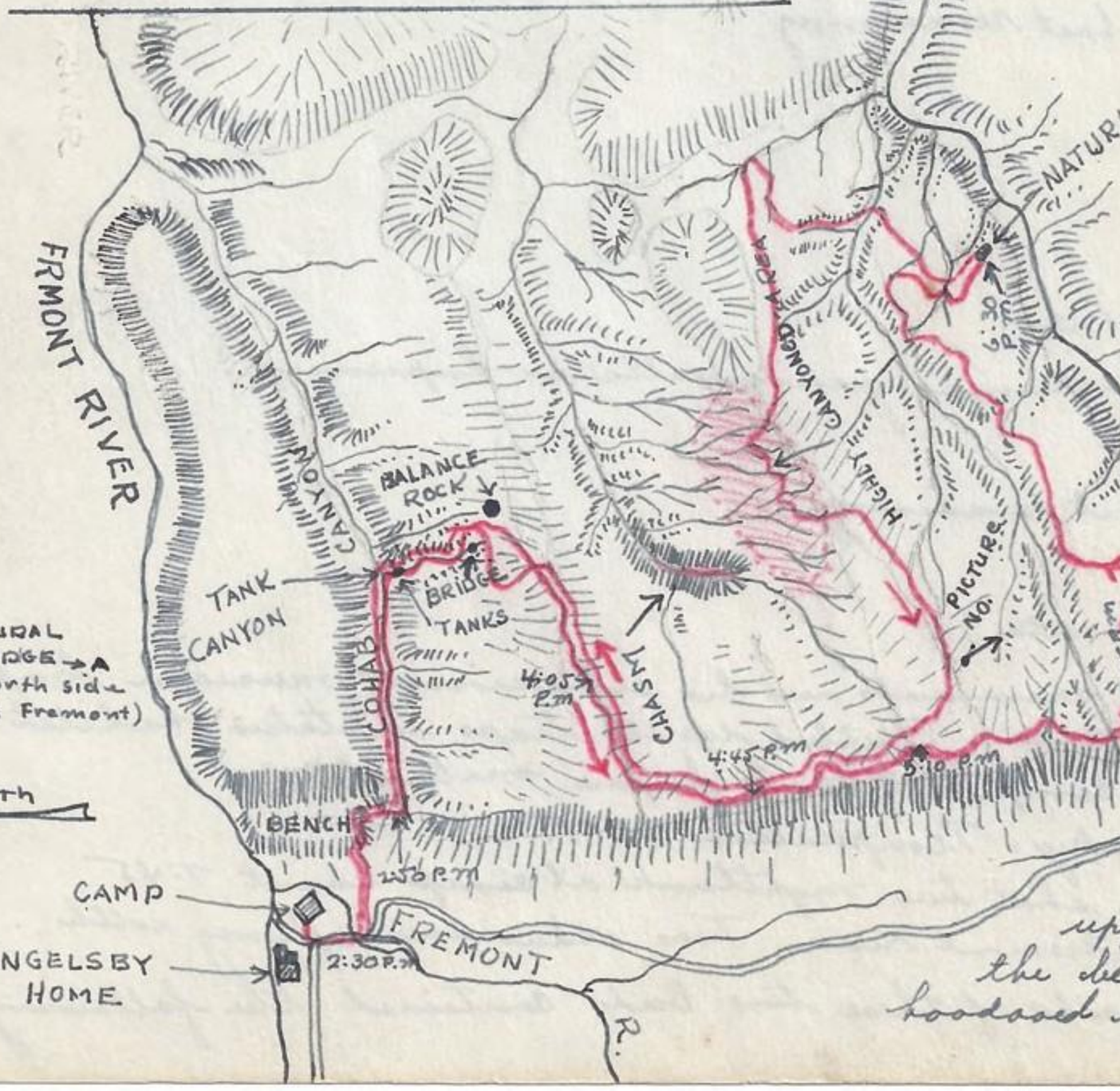
Families represented.

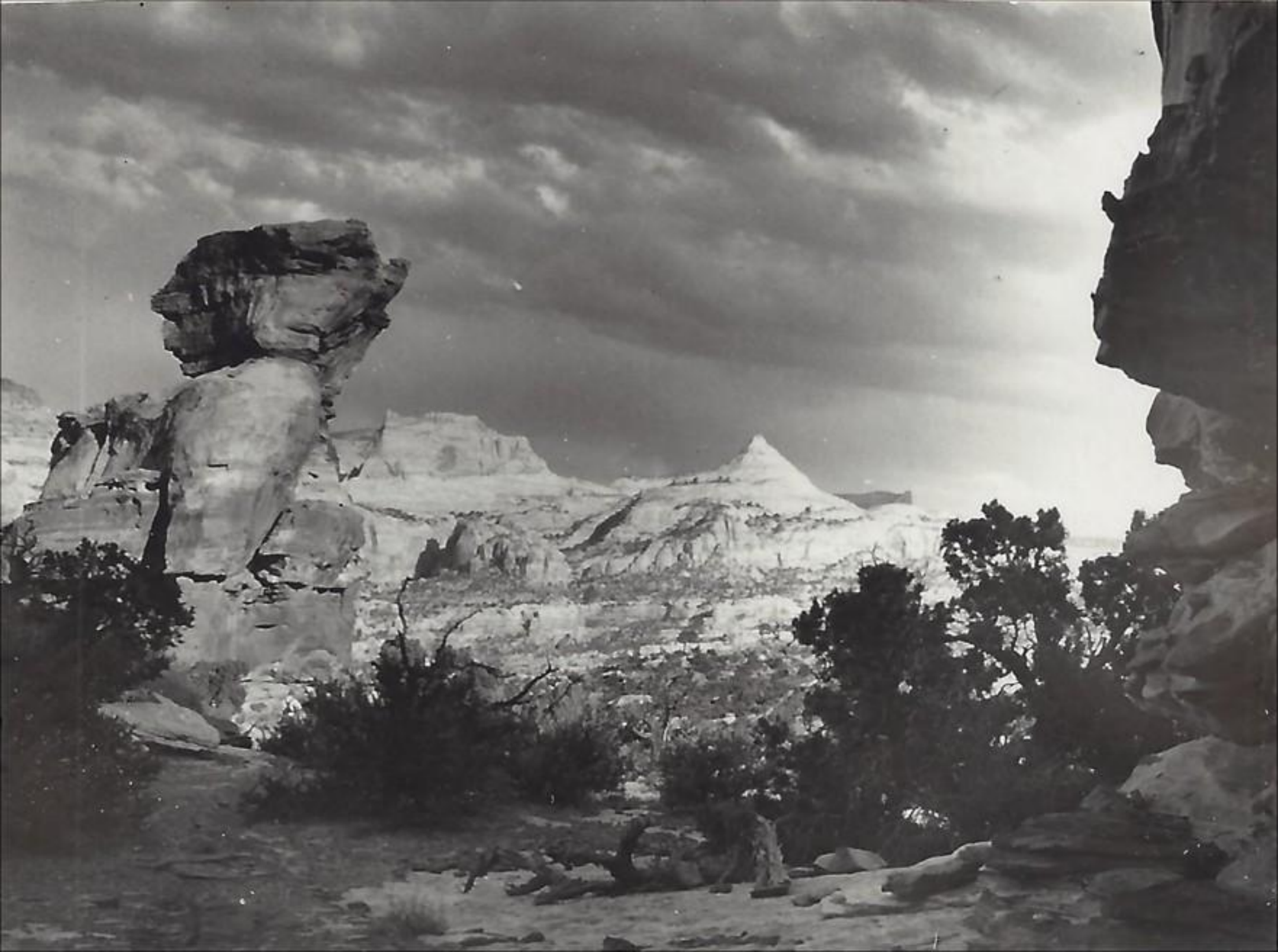
after dinner and having completed our mounting decided to hike over to the natural bredge on the north side of ~~Capitol~~ Grand Wash. The four of us made the trip. We had been told by Clarence Chestnut that this trip would take us about six hours and was advisable to take all day, Being our only chance and opportunity to take this trip, left knowing that it might be dark on our ~~to~~ return trip.

General itinerary and orientation: The section of the reef traversed lies between Grand and the Fremont River wash. The entire country dips to the east and the drainage conforming, either flowing north, south or east. The route covered is mainly on the peripheral edges of this elevated plateform and is passable with a little exertion while the area east and toward center is nearly impenetrable with highly canyoned surface and deep chasms. In contrast to these erosional canyons are the higher asymetrical pinnacles and prominences which outline the eastern skyline. The western edge of this section is a shear cliff several hundreds of feet high and globally acts as a barrier to the larger animal forms. When on top one finds the Todilto and Navaho in evidence and it is this upper level that one finds the beautiful but grotesque hoodooed effects produced by the Navaho.



1-6-13-38





after leaving Cohab Canyon it is impossible to descend either to the west or the south the only possible way would be to ledge down the north side of Grand wash about 1/2 mile down canyon from natural bridge. Incidently Cohab Canyon received its name from the word Cohabitation. During the early days the mormon pioneers took refuge in this canyon and because of their living together here the canyon has been given this quite appropriate name which is merely a brief of the word Cohabitation. My object was to check upon the annual and bird forms as well as to study the frequency of the lizards that we found so numerous in the valley below. Beck, Tanner & Cannon recorded observations in their respective fields. Left camp at 2:30 P.M. and were soon on trail leading up boulder strewn side hill flanking the south and west end of elevated bench. at 2:40 heard the Cicadas calling in sparse vegetation growing up this hot and dry hill slope.

2:46 P.M. Sceloporus on bench.

2:50 P.M. Arrived at pass at head of Cohab. Pleasant wind which was very welcome during our brief stop. The skies to the west held threatening rain clouds with a small patch of blue sky peering through the generally hazy atmosphere.

3:06 Have traversed the upper limits of Cohab without seeing one lizard and are now at the junction of Tank Canyon which leads to the south. On our arrival here scared up a Jack rabbit who, without much chance of direction, to turn ran down canyon. At the same moment saw an antelope Chipmunk scurrying over the bare rocks where yesterday we had collected the Rock squirrel. From this junction one must follow up the left side of tanks canyon and keep about 80' up canyon wall from bottom of gulch. The gulch is passable in the bottom of it but very difficult to climb out of the section supporting the tanks. After passing through the last 300' of Tank Canyon the head opens up into a boulder gulch with the perpendicular and confining walls. Mosquito larva still swimming about in the upper tank which has already been described in yesterdays notes.

3:15 Collected small Eutamias 100' above tank. Felt a few drops of rain that fell from the dark clouds above.

4:00 Eutamias stopped at 80' then ran out of site over the bare rock surfaces and among the Juniper & Pinyon trees.

4:05 Eutamias on head of second canyon to the west. We have already passed the natural bridge and Balance Rock and are now following up the dividing ridge trending east and west and separating the lateral Cohab canyons and the canyons to the south which enter the deep Chasm.

4:45 P.M. Now looking down over brink of high perpendicular Wingate cliffs to the extreme western edge of reef. The small road can be seen below. Took 11 seconds for a boulder to travel the distance from this level down to the base of the Wingate. The distance the rock traveled will represent width of formation

Rather peculiar but up to this point have not seen any lizards or birds since 4:05 P.M. Continuing along this bench enjoying the varied views about, the one side without an apparent bottom while to the east the country is broken & fashioned in bold relief.

5:10 P.M. Crossing second canyon. Here the white & red capped figures lend a ghostly expression to the panoramic picture beyond. When we first approached this canyon head the Canyon Wren began to call and continued until we had descended, crossed & climbed out on the other side. It held several small insects in mouth and probably had young hidden somewhere in the intricate maze of canyons and gulches. When 300' up south side of this canyon it began to sing its descending rhapsody as if more than happy that we had passed beyond its territorial limits. Two Eutamias were seen while crossing. To the east lies a stretch of country highly dissected by a network of canyon beyond which is seen a prominent landmark of brownish colored cliffs, isolated and elevated above surrounding country.

5:20 P.M. Pinyon 80% of tree growth, juniper 20% with scrub live oak and mahogany second in dominance.

5:25 P.M. Halt. Fish like concretions in Todilto. Psaltriparus m. plumbeus feeding in tree tops.

5:30 Three young Eutamias, jack rabbit tracks and a Psaltriparus m. plumbeus.

5:45 Psaltriparus m. plumbeus feeding along in tops of junipers & Pinyons.

6:05 Arrived at S.W point looking straight down into Grand Wash Here the wingate still acts as a barrier and the canyons entering it from the north side drainage all end abruptly at the edge of a shear cliff. Two white throated Swifts and one Say's Phoebe were seen at this point.

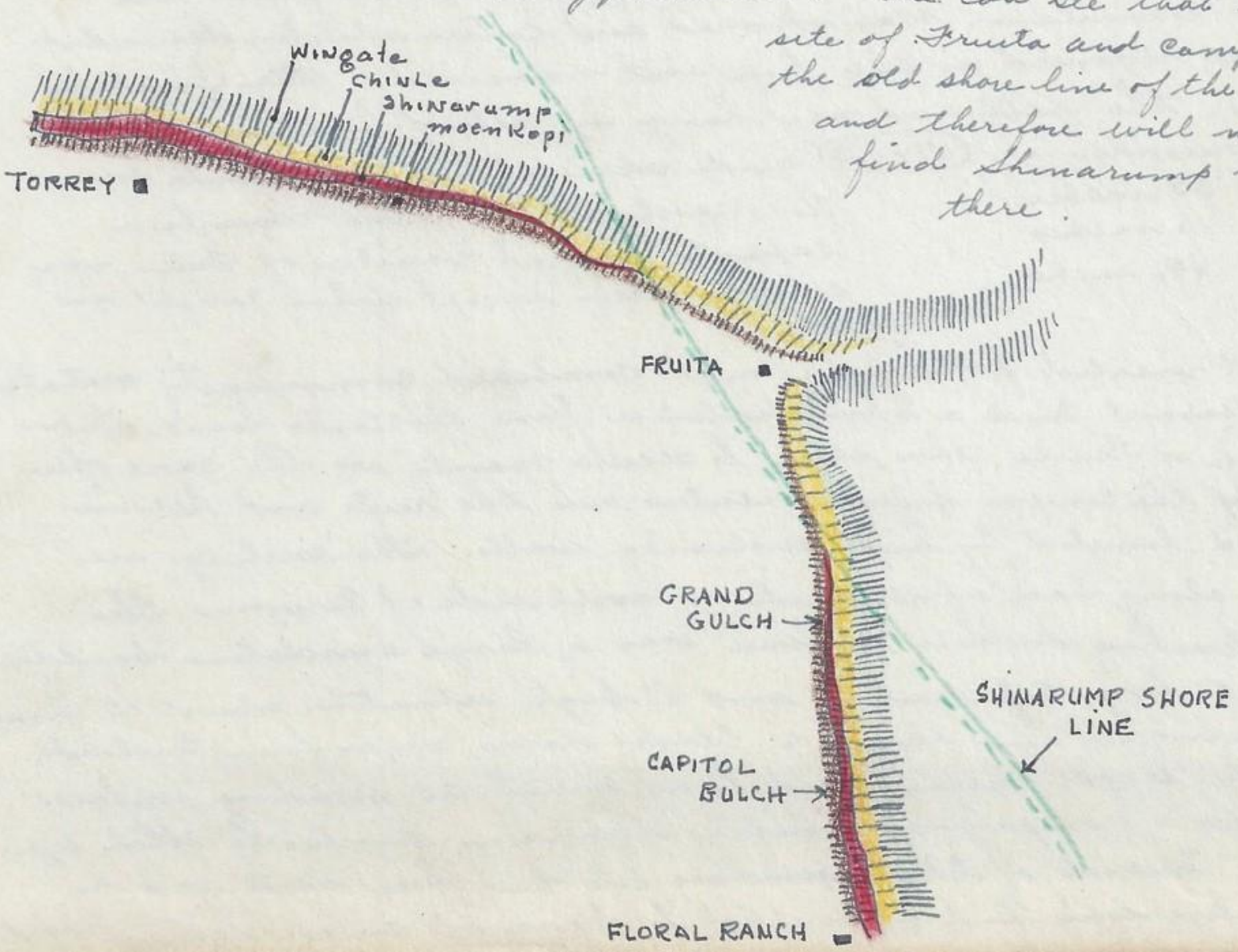
6:30 P.M. Arrived at bridge with very few lights left for pictures even of the distant pinnacles to the South & East. Eutamias at bridge. The bridge is located on the west side of a north-south trending gulch and found at top of gulch wall on the upper Wingate formation. At this point my faithful watch took on a critical case of heart failure which proved fatal, so after respect due to this mechanism closed the wingate and started homeward. [Hazard.]

The return trip proved uneventful except when travelling in darkness over country that seemed treacherous and impassable even in daylight. When arriving at camp at 9:45 found that Clarence Chesnut had already figured it out that it would take keen engineering ability to make a reentrance into Cabot Canyon after dark and fully appreciating our total lack of such qualities merely assumed that we were lost and had planned on staying out that nite. The more I reflect upon this trip the more I feel Clarence was closer to the probable thing that could have happened than we were to getting back to camp that night. He seemed to be pretty well acquainted with the impossibilities of this country and I no longer wonder why he had no intentions of sending out a searching party when we failed to arrive on time. The thing that appeared so interesting to me on this trip was the decided lacking of both reptile and bird forms on the upper barren mesa. Possibly the

weather condition played a role today in this apparently lifeless area and again the nearness to the wingate barrier may also be a factor in the present frequency of these forms plentifully numbered below on valley floor but apparently lacking here. I personally recorded all lizards observed on this trip and while the other members of party claimed to have observed several others, the total is still insufficient to even be classed as scarce. Recorded all birds observed except one or two unfamiliar calls. Here again there is a decided barrenness in the bird population as compared with the valley below. Possibly George come near the solution when he remarks. "Why the hell they want to live up here for anyway".

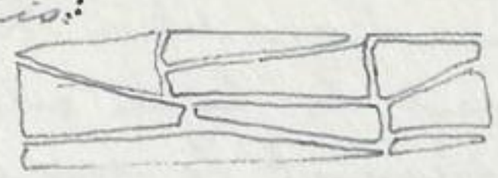
* Station 1. 6/14/38 - Fruita.

This morning we went over to Dr. Ingelbys to look at some of his fossils and indian material and while over there he suggested we take a little trip down to Pleasant Creek at a point where it enters the reef. We were shown several fossil leaf patterns (winged seeds, beetle (?), brachypods found at Green River shales) the Utah Tipe-melata and manna. Left camp in morning with our party & Dr. Ingelsby as guide and drove down to the Floral Ranch on the Pleasant Creek. Just before coming to the Capital wash (1. block) we were told that a cave roof had collapsed last november; a cave that had been used by campers for many years. It lies just off road 20' to left and now has fresh sandstone blocks on the threshold. Shortly after leaving Fruita we began to find the exposure of Shinarump that is lacking at camp and as we proceeded to the south the width of this formation increased. The same thing is true in traveling west from Fruita, so in reconstructing the old sea shore line would take on this appearance. One can see that the present site of Fruita and camp is beyond the old shore line of the Shinarump and therefore will not expect to find Shinarump exposures there.



380614-130.1

Another very interesting geological structure was a set of mud cracks exposed in Moenkopi formation along side of road near Capitol Wash. Associated with these mud cracks were ripple marks above and below. The cracks and fractures penetrated several layers of the Moenkopi formation and had a pattern like this:



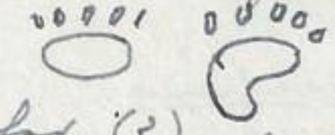
This formation lies 20' to left of only bridge crossed during travels.

Left Capitol Wash road near head of canyon and continued south in same general direction as we had traveled since leaving Fruita. The west mountain is called Miners mountain and presents the same topographical expression along its entire length. The surface of this mountain is, relatively speaking, smooth except for the large canyons like the Fremont and Pleasant creek which have cut down through and have produced profound splits upon the otherwise slope that is free from obstructions and ruffness. It dips strongly to the east. The slope supports a rank growth of Juniper and Pinyon and when viewed from road represents a nearly solid green mass from the top of its crest down the dipping slope to the abutment of the west flank of the Waynewonderland fisper. The formations are Kaibab limestones (?) with a superficial veneer of Moenkopi. It is certainly a contrast to the ruggedness of the reef to the left. On arrival at the Thoral Ranch met Mr. Bullard who has ranched it for many years. This section is very similar to Fruita and one finds a similar topographical expression. We. Mr. Bullard, trapped a gray fat, at the upper limit of his ranch at a point where Pleasant Creeks issues from the Miners Mountain. Was skinned and entire skeleton discarded but was regained on this trip and measured. Dr. Angelsby possesses the pelt and now hangs in cellar of his home. Its skull number is (674 J.B) and skeletal measurements are:

Length	35 inches
Tail	16 inches
Foot	4 3/4 inches.

He reports that Miners mountain supports several varieties of Foxes, very seldom seen except when caught in traps.

We first visited petroglyphs and combined community metates down Pleasant Creek a short distance from Bullards home. Like petroglyphs of Fruita. They seem to occur mainly in the more open section of the canyon before it enters into the reefs and becomes fused and limited by high enclosing walls. The writings are mainly along base of Wingate on north side of Canyon. The first interesting Indian evidence was a large sandstone boulder about 15' long, 5 feet wide and 6' high. situation about 10' from base of wingate and about 2 blocks down canyon from Bullards. Upon the upper surface had been carved 25 grinding surfaces with their accompanying secondary depressions similar to Utah type metate. Several of these grinding pits had been destroyed by pot hunters who had attempted to break off certain section of the

rock. Unfortunately the rock fractured along and cracked across some of the depression, so besides the perfect one left are several with just an end to indicate their former presence and position. They all were of the same size and outline measuring on the average about 3 inches wide and 10½" long. and covered the entire surface of rock. Beside these metale like depression were several long and irregular lines grooved into surface which were used to polish beds etc. or could they have had any connection with the picking instruments used in their petroglyphic work. The petroglyphs on wall 10' away and depicted beautiful bear paws both front and back , deer tracks, mt sheep or goats (?), coyotes (?), fox (?), snakes (?), eagle or some bird (?), and many human forms and other unique form without any apparent intelligible meaning. Many of the pictroglyphs were surely of the Fremont Peoples, especially the pictrographs on south side of canyon. A short distance down canyon on same side of canyon we ran across a character resembling a snake mouthing. It was continuous like this for 29 feet  and placed on a horizontal level. Many other characters were associated with this series. Leaving this side of canyon crossed Pleasant Creek and visited a cave on south side of canyon. The stream of water is crystal clear and cold and no wonder the prehistoric Indian favored the canyon environs. It flows 6½ second feet in normal flow period. It was supposed to be a little higher now and at one point found it rather difficult to cross without getting wet. Beautiful clouds and rather warm. From the cave where pictographs are placed worked up canyon toward Bullards and around hillside to south for about 2 blocks where we were shown some excellent examples of petrified wood. These tree sections are in Chinle formation about 60' below ledge forming red sandstone in center of Chinle. and some distance above Moenkopi below. One continuous section measured 53' of exposed silicified trunk without any breaks and in tact. There is a probability of an extension to either the north or the south of this tree trunk, measured only portion exposed and knew positively of its continuity. Just a few feet west of this tree is another one with a butt of 6 feet through. Traced another one but felling in missing sections for 125'. Another measured 65' and 2½' in thickness. On our descent from tree section ran across a patch of perfectly round nodules on the lower Chinle. ranging from  down to 0 in size. They seemed to be limited to this isolated area only and to approach this area unaware would spell a fall as one stepped upon the rolling balls. At base of slope near road found car tracks where someone had evidently

loaded [illegible] or cacti plants. Back to Bullards Ranch House again. Birds seen on this little reconnaisance trip at Ranch:
One spurred Towhee: singing in willow thicket along river near house.
Canyon Wren. On rocky slope.
Robins. Several along cottonwoods bordering stream near house
Dryobates pubescens leucurus. (681 J.B.) collected in row of cottonwood trees near river. It appeared to be very aggressive and called vigorously the entire time until collected.
No. Orioles.
Myiarchus c. cinerascens. Along creek bed in small cottonwood tree.
Sayornis saya saya
Psaltriparus m. plumbeus.
House Finch
Hawk (Cooper.) (?)
Citellus grammurus grammurus
Citellus leucurus leucurus
Marmota
Sylvilagus (Sp.) Swallow (Sp.)
Robin nest located in sagebrush patch in sage 2½ ft high with young 1/2 size of parent bird. Another young robin seen flying from tree to tree.

This area around the Floral Ranch appears to me to be a very likely place for future trapping operations and one could profitably spend a week here, trapping and collecting on Miners Mountain and up & down the Pleasant Creek Canyons. Our return trip to Fruita recorded mileage. At Bullards Ranch read 43.0 → Capital Wash 45.7 → Grand Wash 50.5 → Divide looking down into Fruita 51.6 → Fruita 53. Golden Throne of Grand Wash taken on return trip. From road looking N.E and taken on 22 x 1/25 with verichrome. Skies clear except few white clouds. 5 Citellus leucurus leucurus seen at mouth of Grand Wash. After returning to camp and finishing a somewhat belated dinner George and I set out with full series of wood & steel traps. Fruita we place the steel & wood traps about midway along hillside east of camp, extending from junction of creeks down Fremont to where perpendicular cliffs control the side of the canyon. our objective being to complete series of Neotoma. All traps were associated with cliffs and rock accumulations at base of mostly on runways at base of ledges. The museum specials were all placed in an Indian Cave on the south side of the Fremont canyon about. ¼ block from camp. The cave is about 100' long and has a 40' recess. It is of the more or less open type with mammoth symetrical arch 100' high. The roof of this cave has been continually



1-6-14-38



growing away and as a result a large accumulation of boulder now lie at the foot & front ~~the~~ accumulation being about 30' high. In back of this accumulation of boulder is found a more or less flat floor with a small gulch intercepting floor and back of cave. The floor is of sand with vens growing on sides of 3' gulch at back of cave. It appeared to me that there must have been hundreds of Bloomyces and lizards to have created the numerous tracks on the quiet sands at the back of this cave. Where the ~~occasional~~ gully has cut down the old floor level at back of cave, one can see the exposure of charred material and ancient Indian habitation levels. It certainly appears to me to be a wonderful cave for careful excavation. One old brewery of stone is located here. Placed traps in this cave and concentrated them all within confines of the protecting roof above. Returned to camp. After supper Ingelsby & Clarence Chesnut informs ~~us~~ concerning some of the wild life. Ingelsby reports that he has seen two porcupines since he has lived here the last few years. He relates an interesting experience with the Neotoma. One pack rat carried away his smaller tools like tacks, nails, screws etc but favoring especially the the the steel bits. Told us of the times when he used to hunt ducks at the new State Gun Club. back in 1900-1905. One day he shot 500 shells after 2 o'clock in the afternoon. Eight people in his party filled a picking shed so that the door would not close, and estimates there being 5,000 ducks represented after the day hunting. Clarence Chesnut reports the Spotted and large striped Skunks as being here and also an occasional Cinct cat. He knows of only one gopher here and its diggings are found in orchard. The bats were flying tonight at sun down and six were seen in air at one time. Altitude here is 5,200. Clarence also reports seeing several Garter snake and one blue racer during his raking up of the hay on his property. At 10:30 P.M tonite Helmer and I visited a small swamp about 1 acre in extent to the right of the road at point where it crosses the Fremont River. our purpose being to check on the Bufo ~~H~~woodhousii and Bufo boreas. In this small area counted 13 Bufo woodhousii and heard 7 more in adjoining fields. Four of these were in horse foot imprints in water and within 3' of each other. Two others were together at edge of running water and greater part of body submerged. Five others were isolated but within 15' of each other. When frightened in swamp they would dive down into shallow water and whether the act was purposeful or not the water became decidedly muddy which acted as a protector from the invader. Nearly all toads were found submerged with only head and neck protruding. Their calls carry well and can be heard over a block away and when within 15' the call still ~~seems~~ sounds as if far away but how deceptive when we find it almost under our feet. On our return found several hopping about in middle of road but not calling as those found in water. Clear starlight, full moon, all

stars 38061 4-134 bright as jewels. Temperature 56° at about 11:00 P.M.

× Station 1. 6/15/38 - Truita.
After breakfast gathered trap returns.
Woods and steels along cliffs set for Neotoma.
1. (675 J.B) Neotoma. Top of talus at base of cliffs
2. Bait gone trap not sprung.
3. " " " " "
4. " " " sprung.
On north end of bench about 1/2 way up saw a Ulo & a Cnemidophorus among boulders. also a Citellus grammurus grammurus and a Eutamias row up slope.
5. Bait gone. not sprung
6 Bait gone " "
Chipmunk scurried up hillside
7. (676 J.B) Peromyscus
8. (677 J.B) Neotoma lepida monetabilis ♀ among large boulder at base of cliff near nest.
9. Bait gone not sprung
10 " " " "
11. Sprung
Museum Special return from cave.
1. not visited
2 " "
3 " "
4 " "
5 " "
6 " "
7 " "
8 " "
9 " "
10 " "
11 " "
12 " "
13 " "
14
15 " "
16 " "
17 " "
18 " "
19 " "
20 " "
21 " "
22 " "
23 " "
24. (678 J.B) Immature Neotoma l. monetabilis. at back of cave.
25. not visited
26 not visited.
George set along top of accumulation across cave fromt and reports 5 Peromyscus only. Was quite surprise at last nites catch, but that frequently happens and one must be cautious in assuming the degree of actively of likely areas unless substantiated by returns from a trap line of same area.
Collected Sayornis saya-saya in front of cave (679 J.B) and was flying along the side of cliff inspecting the honey combed pockit. On returning to camp collected a Spizella m. pallad (680 J.B) at junction of Sulphur and Fremont feeding at edge of creek at base of willow and cottonwood.

(676 J.B) Peromyscus specimen with tail injured so destroyed and kept skull only. Length 156 m.m
Tail 80 m.m.
Foot 22 m.m

(678 J.B) neotoma l. m. Immature and destroyed. Fat and in good condition Length 222 m.m.
tail 101 m.m.
foot 38 m.m.

(675 J.B) neotoma l. m. Large bot fly larva in neck below right ear, under skin. Small hole 1/8" penetrated into skin when larva head was situated

(679 J.B) Sayornis saya saya. Testis 9. m.m long.
after preparing material rewsited the steels & wood traps set for neotoma. Left in same position as last night Picked up neotoma (685 J.B) that I had missed this morning but was too far gone and so destroyed. Saw numerous Seelephorus, Cremnadelphus and Uta this morning in route but only one this evening. Thirty White throated Swifts were flying in one pod quite high above the canyon floor. There was a continuous call from these birds as they drifted up river to the west and south. In following the weather through today the skies were clear and temperature high. Towards noon clouds become in evidence and by evening looked threatening and raining in some areas however blue was discernable in the east. Subtle wind. After resetting woods and steels returned to camp and set out with museum specials to trap the swamp habitat. The meadow visited last nite was chosen for one site and a wet pasture west of of Mr. Gifford was chosen as the second site. The first site is bordering the Fremont river and and has standing water among the elevated hill produced by the tramping of horses and cows. A rock wall forms the south edge while the road acts as a barrier on the east side. The Fremont river borders on the west and north. The second swamp habitat is more typical, supporting a good growth of Juncus grasses and water covers a considerable portion between the grasses. Here the barriers are limited and the mammals have opportunity to moved along river or into the adjacent field of grain and alfalfa on all sides. a small water choked creek runs along the east side of field.
Back to camp and bed.

* Station 1. 6/16/38. Fruita.
After breakfast gather all traps in as it was our last day at this station. The woods & steels had been put in play for the last two or three days & had not been moved from their original setting.
Wood & Steel trap returns.
1. Bait gone. not sprung
2. Set off. Placed in Ingelshys working shop where rats were being accused of carrying off the small steel kits.
3. Bait gone. not sprung
4. Bait gone not sprung.

crotalus cerastes on red hills near bottom of Canyon the first of last November. He also states that the micratus are on the fields at Pleasant Creek and frequently the nests get in way of mower. The blue snake so frequently found and he protects them. One day he saw a blue snake at robins nest on fruit tree. He took it and placed it on other side of Fremont and the second day the snake back again on same robin nest. The snake had one bird in mouth and the second one wrapped around body. He also claims the micratis are on the fields around his place. George picked up a navigator shrew this morning on one of his traps along the Fremont River. along the river the willow grow in a dense mass that is almost unpenetrable. Returned to camp and prepared specimens. Collected Tres sabinaeus plumbeus (686 J.B.) Telmatodytes in tree above camp while skinning the mammals. It had a characteristic call and offered at continuously while feeding on tops of trees. Nearly every day it would pause at this tree for a short while and feed before moving on to next stop.

Wilmer collected Swallow at Shed near camp (687 J.B.) but was pretty well shot up and so destroyed. It had a mass of eggs about this size ∴∵∴. Determined as the Northern Violet Green and then destroyed skin. No trap line tenits at this station. Bid goodby to Dr. Ingelsby and Mr. Chas Gibbons. They inform me that the mt. sheep were in the Henry Mountains and were formerly here on the Wonderland.

In leaving our Station at Fruita on the Wonderland would say that we had hardly touched the surface as far as procurring representative series are concerned. Would suggest that on subsequent survey to concentrate upon the problem of the inactivity of the Dipodomys and to trap more extensive on the more typical sandy situations. There would be a interesting frequency problem of the lower valley areas and the upper barren mesa tops of the Wonderland.

* Station 2 - 6/16/38 Torrey. Arrived at station on the south side of swamp south west of Torrey Cemetery. This area is a typical valley marsh land with extensive fields of tall boggy-loving grasses with rushes and cattail growth bordering the main water course that runs down the center of the area. Nearly all the area is supersaturated and grades in degree of dampness to rush growths along creek through all degrees of boggy lands to the dry and juniper-pinyon covered hills. On arrival and after pitching camp got out on trap line route. Trapped the south side of swamp just north of camp and extending down stream for about 2 blocks. This extensive swamp terminates just west of Cemetery. Returned to camp in time for supper. Wind blew all day with overcast skies. Wind stopped at sun down. Temperature at 9:00 P.M 65° F. Bed under the stars with a mosquito every now & then to annoy.

* Station 2 - 6/17/38 Torrey.
Started on trap line at 8:30 A.M. No wind last night.

380616-136

5. Bait gone trap not sprung
6 " " " " "
7 " " " " "
8 " " " " "
9 " " " " "
10 " " " " "
11. Bait gone - sprung. Base of perpendicular cliffs where larger animal forms were crossing as evidenced by the tracks.
12. Bait gone. Ibid.
13 " " "

It would appear as if the Peromyscus had visited all traps except one. The sky was without a cloud with slight up canyon breeze. Cool in shirt sleeves. Two chipmunks near river, one stopped on rock until within 20' then ran 20' and stayed until I passed by. Swifts in air. Did not see any lizards this morning over same route and same time as covered yesterday.

Museum Specials return in swamp habitat. First field south of Chesnut home, second field west of Gifford home.

1. not visited. Edge of swamp under brush growth.
2. " " " " " " " "
3. " " " " " " " "
4. not visited. along base of rock wall crossing south end of swamp.
5 " " " " " " " "
6. " " along moss covered cottonwood tree that had fallen into swamp.
7 not visited Ibid.
8. " " "
9. not visited. along wall near source of water.
10. " " " " " " "
11 " " " " " "
12 " " " " " "
13 " " " " " "
14 " " " " " "

meadow west of Gifford home.

15. not visited.
16. Sprung
17
18 (684 J.B) Reithrodontomys megalotis megalotis. Among tall Juncus grasses in damp situation but not standing water. 30' from edge of creek.
19. (682 J.B.) House mouse. along fence line with willow growth 3. edge of field. This fence line was almost dry ground but bording wet meadow.
20. not visited. Ibid.
21 " " "
22 " " "
23. (683 J.B) Reithrodontomys m. m. along water cress choked creek on sides in tall grasses.
24. not visited. along creek edge
25. " " " " "
26. " " " "

Collected Garter snake along water cress filled ditch on bank. and gave to Gardner. (L)

On passing Mr Gifford home which is first home above Chesnut home chanced to meet him. He states that he saw upon a

380617 - 138

Trap returns of museum Specials set in marsh.

1. not visited. Set for Dipodomys on sandy area near camp.
2. " " " " " " " " " "
3. Sprung. wet & damp grass fields bordering marsh proper.
4. " " " " " " " "
5 " " " " " " " "
6 " " " " " " " "
7. " " " " " " " "
8 " " " " " " " "
9 " " " " " " " "
10 " " " " " " " "
11 " " " " " " " "
12 (691 J.B) Reithrodontomys megalotis megalotis. Between grass bunches on damp situation.
13. (694 J.B) Ibid.
14. Sprung Damp grass field bordering marsh.
15 " " " " " "
16. not visited Ibid.
17. (695 J.B) Microtus mordax mordax. Tall grasses near swamp proper.
18. not visited
19. (688 J.B) Reithrodontomys megalotis megalotis. Damp situation among tall grass bordering wet marsh land.
20. not visited
21 " "
22. (690 J.B) Reithrodontomys m. megalotis. Damp situation but not wet surface among tall grasses.
23. not visited
24. (689 J.B) Reithrodontomys m. megalotis. Damp situation but not standing water. Among tall grasses.

Small mouse traps.

5 Sprung. Tall grass bordering boggy meadow.
6. not visited " "
7. Sprung - bait gone. " "
8. not visited. " "
9. " " " "
10 " " " "
15. not visited. Along weed fence running across wet marsh.
24 " " Ibid
23 " " "
21 " " "
22 " " "
20. (697 J.B) Microtus mordax. mordax. In run way along base of logs on fence line.
19. Sprung - bait remaining
18. not visited. along fence line across wet meadow
17 " " Ibid.
16 " " "
15 " " "
14 (698 J.B) Microtus mordax mordax.
13. (696 J.B.) Microtus mordax mordax. Same fence line as above

On return from line saw two Sylvilagus, one in Chrysothamnus at edge of pasture, the other setting near home in rock among junipers & pinyons.

Returned to camp & prepared material.

(698 J.B) Microtus m. modoc. a natural bobbed tail one with tail 5. m.m in length. Male with testicles well developed Saved skull only. wt grams 54 foot 21 m.m.

(690 J.B) Testicles 12 m.m. long.

(694 J.B) Ruthrodontomys m. megalotis Testes 8 m.m. and between the muscle fibres of femur was a mass of yellow purulent matter. Femoral pore 2 m.m x 12 m.m.

(697 J.B) Microtus modoc modoc. Embryo averaging 2 m.m. no femoral pore on skin.

George collected a large microtus which had 4 young embryos one being 39 m.m in length. He also collected in same area 3 large Microtus and 3 small ones + 3 Peromyscus.

Prepared material and then drove car over to the Fremont River on road to Grover to set traps for Cynomys. Mileage at camp read 87.6 → Fremont river 89.9 miles. The Cynomys field is about halfway and Dr. Beck & I set 9 steel traps in likely holes. There were dozens of holes in area and groups in little series to represent different families. Heard three for sure. The trails led from one group of holes to the other and had been extensively used at one time. Found one skeleton near holes and being near a cultivated field just assumed that they had been poisoned and so the but abandoned apparent lack of animals in an otherwise favorable Cynomys town. Returned to camp & finished mounting.

(692 J.B) Passerculus sandwichensis nevadensis collect in field near swamp. Eggs measured 2.5 m.m in width.

(693 J.B) Passerculus sandwichensis nevadensis. Ibid. Mate of above. Testes 11.5 m.m long.

This evening set all the museum specials and small wood mice traps on north side of swamp about 1 block west from the head of the large marsh. This section grades from the slow moving meadow stream lined with small cattails through tall Junnus grass and other grass to upper spring & boggy areas to dry flats. Any condition could be found in this 400 foot stream bordering marsh land and traps were placed mainly in areas where there was a thin sheet of muddy water upon a muddy undersurface. The fields were netted with a series of microtus runways some with water filling path. Most of the grass was about 1 foot high and some places was matted with the last years dry grass. Many of the boggy flats could be told by the short broad leaf grass, of lighter greenish color and springy & buoyant surface. Returned to camp & soon to bed.

Station 2 - 6/18/38 Torrey.

Temperature 55° F at 6:00 A.M. No wind and skies clear. After breakfast was soon on field to pick up traps.

380618-140

Trap line returns:

1. Unaffected. Set for Sepedomys in sandy area bordering swamp
2. Unaffected.
3. (702 J.B) Peromyscus m. sonoriensis. In mustis trail along fence line that that runs down through meadow into the deep water and cattails. Trail run way on slightly elevated ground under fence line but with sedges and and standing water on each side. This fence line comes from the upper dry fields and runs down to deep water through all varied habitats.
4. Mustis caught at lower limits of fence line along fence line with were grass 1½' high and in standing water. Trail water soaked. This animal had been eaten all except head and front legs and a few bits of fur.
5 Run way for mustis in tall sedges and boggy ground. trap sprung but bait remaining.
6. not visited. Set in small opening about size of trap in 1½ foot high sedges and matted older wire grasses in water soaked ground which sinks down 2 inches when stepped upon.
7. Mustis mordax mordax (706 J.B) in trail in wire grass 1½ feet high with matted dry grass mixed in. Trail water soaked and had chewed grass stems along side.
8. Reithrodontomys. Ibid but near bog patch with short broadleaf sedge. (709 J.B)
9. (710 J.B) mustis mordax mordax. Trap set in standing water 1 inch deep in trail in wire grass in boggy area.
10. Sprung. Ibid
11. Sprung in trail.
12. (708 J.B) mustis. m. mordax. Eaten completely. Traps set in trail as above.
13. Sprung. In runway in tall sedges.
14 (704 J.B) mustis m. mordax. along fence line in runway with standing water on each side.
15 (711 J.B) Mustis m. mordax. Eaten. In runway along fence in wire grass and water saturated ground.
16. (712 J.B) Mustis m. mordax. In lateral runway 3' from runway along fence line. It was caught in lateral and caught in such a position as would indicate that it had left fence line runway. Lateral of high wire grass and trail in standing water soaked ground.
17. Sprung. In a lateral as above.
18. (700 J.B) Reithrodontomys megalotis megalotis. On same trail as 711 J.B but further up the fence line in drier situation.
19. Unaffected. Ibid
20. Lost.
21. (705 J.B) Mustis m. mordax. In run way 2' high wire grass and water saturated soil.
22. (703 J.B) Mustis m. mordax. Caught in drier situation along fence line but with with wire grass and wet lands bordering.
23. Unaffected.
24. (708 J.B). Same as 703 above.

Returned to camp. and prepared ↘ material

708 J.B mucratis eaten on back of head, upper neck and and fleshy parts of the shoulders. Destroyed.
Length 145 m.m.
Tail 46 m.m. ♂
Foot 21 m.m

709 J.B Reithrodontomys m.m. Skull fractured & destroyed.
Length 129 m.m
Tail 64 m.m. ♂
Foot 18 m.m

710 J.B mucratus Mordat mordus. Body entirely severed from head and evidently carried away. Caught in run way along main path.

711 J.B. mucratus m. mordat. Head meat, ment of neck, flesh of legs and along back bone eaten while intestines, liver and heart were exposed but not eatened.

712 J.B mucratis. Immature & destroyed.
Length 139 m.m.
Tail 41 m.m.
Foot 20.5 m.m.

713 J.B Passerculus ? nevadensis. Wilmer accompanied on trap line and shot in fields west of cemetery at 9:30 A.M. male bird setting on fence line with female and sang occasionally. When ♀ was collected, ♂ flew down to lower wire and became concerned over dead ♀. He was rather loathe to leave ♀ and flew 50' down fence line when approached.

714 J.B Passerculus s. nevadensis. Wilmer shot in field of wire grass and broad leafed sedge on wet land.

707 J.B Eclaparacta. Taken from this mucratis which was attached to outer surface of skin below right front leg on belly. Preserved in Bouins fluid & fixing sol.

715 J.B Wilmer shot Citellus lateralis lateralis 2 miles from camp on Grover road.

716 J.B Wilmer Tanner shot Citellus lateralis lateralis 2 miles on road towards Grover.
Length 118 m.m
Tail 67 m.m
Foot 40 m.m
W. grams 124

705 J.B. micratis m. mordat 8 embryos averaging 9. m.m in curled uterus. One of these measured 4. m.m.

706 J.B Micratus m. mordat. Testes 13 m.m. 28 m.m femoral glands on skin. (or normal)

703 J.B micratus m.m. No development of ovary or uterus

701 J.B Reithrodontomys m. megalotis. 3 embryos on one side 2 on other averaging 2 m.m in curled position.

717 J.B Wilmer Tanner collected Sylvilagus on south side of camp. Frightened from Chrysothamnus. 7:30 A.M.
Length 379 m.m
Tail 48 m.m ♂
Foot 84 m.m.

707 J.B micratis mordax mordat. Uterus normal but milk in mammalary glands. In good condition.

Finished work here at station 2 shortly after noon meal and by 3:30 P.M were ready to leave for the Aquarius Plateau. The object was to record all birds & animals seen and the beginning of the higher vegetation as we first run across it on trail and to associate observations with the mileage meter and time. Our itinerary and destination are Torrey → Teasdale → around road to east of high aquarius to Steep Creek on the S. E. side of mountain.

Left Station 2 - at Torrey at 3:35 P.M. with mileage at cemetery 01.3.

03.9. Crossing Fremont river. This country we have just passed through is of the Juniper.-pinyon association with the valleys being formed between the Mesa-topic ledges & small buttes. Have seen 4 bluebirds, Raven, Thrasher. Ponderosa pine, brush at 05.3.

05.4. Cacti dominate the fields are are yellow in color.

05.8. Rock wren on boulder along side of road.

The pinyon & juniper are profusely found on both sides of road with the pinyon in dominance. Sage found also among trees.

06.7. Bluebird

06.8 Jack rabbit

08.5 Town of Grover. Birds seen at Grover while passing through are the Brewers Blackbird, Robin & English Sparrow.

09.0 Raven

09.3 Jack rabbit.

09.4 Sparrow Hawk. Now passing among the junipers & pinyons. and they appear to be closer together.

09.5 Eutamias

10.1 Entrance to Powell national Forest with the Ponderosa Pine coming into the picture. Birch line the stream banks. Heard thrush.

10.8 Few red cedars but pinyons dominate. Yucca seen for first time. Brush completely bordering stream.

11.0 Carcass Creek. Thrush singing. aspen along creek. yucca patch on hillside. Gilia in blossom. Chrysothamnus & Artemesia present. General evening primrose in blossom.

11.5 Good stand of Ponderosa pine. Several yucca.

11.9 Single juniper and several yucca.

12.2 Good stand of Ponderosa pine. and elderberry bushes.

13.0 W. Throated swift & bluebird.

13.4 Eutamias adseitus.

13.4 Spruce (?)

13.6 Eutamias (sp.)

13.9 Saw mill at 4:20 P.M. and Callospermophilus at camp.

14.0 Callospermophilus l. l.

14.1 " " " Stopped for 12 minutes. Chipping sparrow singing, picket up Indian point in forest by accident. Wilmer shot Callospermophilus (—). Started again at 3:35

14.4 Single tree creek. Woodpecker (sp.) & robin.

14.8 Oak growth in evidence

15.9 Several chokecherry.

18.9. Eutamias & yucca. Lupine & oak coming in good.

20.0 Ranger Station.

20.6 Pleasant Creek (diverted)

21.3. Birch, Spruce and good trapping valley.

21.7 Oak Creek Camp. a beautiful creek passes down through aspen. Oak Creek Reservoir about 2 miles west and good trail leading to it. Met Mr. Bentley the Forest Ranger passing by on road. He had left Teasdale this morning & had gone up over

the Aquarius and down into Pass Lake country. Blue bird at camp.

22.2 Oak Creek
22.9 Bluebird
23.2 Jones Canyon
23.7 G.H. Creek (?)
24.2 Blue bird
24.4 Robin
25.0 Thrush
25.9 Evidence of new erosion on right side of road, gullying the steep hill side.
26.1 Snow bank
26.7 Two snow patches 10x20 on right side of road.
26.9 Divide
27.1 Coral
28.3 Arrived at Step Creek at 6:00 and established our third station of the survey. While passing over the divide saw three large herds of sheep.

This station no 3. Step Creek. is located at the C.C.C spur camp near road. The immediate surrounding area here is in the Canadian Zone with aspen trees dominating. Above this level we found the Hudsonian and below the Transition Zone. The S.E. end of the Aquarius Plateau is an excellent country to conduct a biological survey. a transect running from the top of the mountain, down into the circle cliffs would include five of the seven life Zones all within 15 mile linear strip. Beginning at Barns point at 10,908' altitude one finds an extensive Spruce growth upon the relatively flat Aquarius top. Immediately below is a cap of lava which has protected all formations beneath and as a result the Aquarius has been preserved as a high mesa-like mountain bordering the desert to the N.E., east and south. From the base of the lava cap talus the slope is gentle and has been flattened and carved by the ancient glacier that at one time radiated from the higher aquarius top. These glacier have produced a platform below the lava cap where most of the lake are found. Beyond the peripheral edges of this glacial platform the mountain drops more abruptly and continues down to lower desert country in a series of terminal moraines that produce a rolling & hilly topography. Many of the canyons head at the edge of the glacial platform in amphitheatre like pattern but when the enter the low desert country that abuts against the aquarius they grow and constrict into canyons of profound depth and soon lose themselves in the network of narrow and inaccessible ~~low~~ walled canyons of the adjacent desert. In the distant lowlands adjoining the mountain the rocks are eroded bare of their soils and efface the beautiful reds and whites of the varide stratum. It is this distant desert land of desolation that lends enchantment and puts keen interest in anticipation of the time when we might be collecting among its erasional chasms.

380618-144

a general zonal pattern superimposed upon the topographical profile of this transect would appear like this:



Set trap line tonite near camp among the willows and swamp lands upon what appears to me to be an ancient pond or lake that has since been filled with deposition upon which the willow patches and poor boggy drainage is now found. Its original formation was likely due to glacial action. The small spring that issues from the west hillside causes the meadow with grasses and sedge fellungon the supersaturated wet lands. A small stream from the north flows along the side of a willow patches and eventually meets the lakes of the lower mt side. One small swamp 100' x 100' surrounded by willows on west & north side & aspen on east & south was used for trapping section tonite. Here the grasses grew with water about 2 inches deep in several places. Temperature 44°F at 8:45 P.M. Slight wind. sky clear.

* Station 3. 6/19/38 Step creek.
Pulled traps before breakfast with returns. Set mainly for Microtis and Sorex. in among grasses in wet swamp.

1. unaffected.
2. Trap sprung
3. (719 J.B) Microtis mordax mordax. In tall sedges near willow growth on standing water.
4. unaffected.
5. "
6. unaffected. alongedge of aspen log in swamp.
7. " " " " " " "
8. unaffected. In sedges in swamp
9. " " "
10. " "
11 " "
12 " "
13 " "
14 " "
15 " "
16 " "
17 " "
18 " "
19 " "
20 " "
21 " "
22 " "
23 " "
24. (722 J.B) "

Set other series along bank of small spring that comes down the hillside about 100' north of the camp. The source of this stream is several hundred feet up hillside and comes down through aspens and entering the marsh lands by camp. Higher up along this stream bank are found willows and small bogs. All traps were placed along creek side only a few inches from water in anticipation of determining the degree of migration up or down this creek of the muskrats. The edge was lined with mosses and a few willow. The 40 stretch of the creek trapped was 200' up hill above the marshes below.

1. Unaffected creek edge
2 " "
3 " "
4 " "
5 " "
6 " "
7 " "
8 " "
9 " "
10 " "
11 " "
12 " "
13 Spring. Set 10' from water among aspen & willow.
14 Spring. " " " " " " " "

George set his traps 100' below along same creek and collected 3 muskrats & one chipmunk, which would indicate that they probably do not migrate very far up creek above their meadow habitat below. 90' is the high point up creek from meadow below.

Breakfast at 6:00 A.M and sky without a cloud, no wind and looks like a warm day ahead. After breakfast began skinning & mounting and during the course of the day have made a few observation from the cabin door while at work.
(718 J.B) Melospiza lincolni lincolni. From cabin door watched two Lincoln Sparrows feeding on bare place at edge of swamp. Collected one.
While preparing material at door of cabin a House wren flew into building and after almost lighting upon my head flew over to window screens and after several fruitless attempts finally found the door way again and disappeared.
The Thrush, Juncos & Robin fed along meadow. From the door way of the cabin have a commanding view of the marsh land. The edge of it come within 25' of door. To the right is a grasp of willow trees along edge of swamp while on the opposite side from cabin about 200' away is the east side of swamp lined with aspen trees. To the north and N. E is the extension of the meadow area with the entrance of the creek from the west hillside on the west side and extensive willow patch beyond to the N. E. From the entrance of the hillside creek the water flows down through a patch of willows by cabin among the meadow grasses and then swings back again to the south where it finally enters boggy area before crossing road.

380619-146



STATION 3 — STEEP CREEK

380619-147

(721 J.B) Peromyscus. caught last night in cabin

(720 J.B) " " " " " "

(722 J.B) Peromyscus. Immature and destroyed.

Length 148
Tail 69 ♀
Toe 20

Emery King of Boulder dropped in for a few seconds. He reports that they brought sheep up from circle cliffs and plan to have them on top of the Aquarius by July 8th. He has 1,100 sheep without lambs. The season is so backward that he wonders what they will eat when on top.

House Wren continually singing on opposite side of swamp in aspen trees.

9:40 Hummer paused at door way for second or two.

(720 J.B) Peromyscus. Curled embryo 18 m.m long. Six in number.

(721 J.B) Peromyscus. curled embryo in uterus 14 m.m in length, four in number.

(719 J.B) Mustris m. mordax. Skull fractured and so destroyed.

Length 152 m.m.
Tail 48 m.m. ♂
Foot 20 m.ms
wt gram 30

10:45 A.M. Vulture soared by just clearing tops of aspen. Red. shafted Flicker flew up from feeding at base of willows Exhausting material for mounting stepped out from cabin to collect a couple of Eutamias.

(723 J.B) Eutamias ad. collected at base of hillside spring 100' north of cabin. Feeding on some small plant. Ran to boulder and paused then ran into willow patch and ascended limb to top to view intruder from vantage point.

(724 J.B) Eutamias ad. In association with above on same willow uterus normal.

11:45 A.M. House wren been calling since early this morning.

12:20 A.M. Hummer passed by chirping.

While mounting observed a Lincoln sparrow feeding at edge of swamp below cabin. Here the sedges end abruptly at edge of swamp and are replaced by damp ground but supporting the usual hillside type of grass. The bird fed among and through the sedges and grasses of back water saturated areas and damp edge. Every once and a while it could be seen among the short grasses and then would disappear to present itself on some opening or work back to open edge again. There was a yard square opening at edge that it preferred particularly. It had a Junco like call and was very confusing to recognize and differentiate at first from the chip of the Gray-headed that was frequently seen feeding in same area. It flew into lower limb of willow when approached and scrapped its bill on limb. Collected this bird. (725 J.B) and then back to job again.

1:00 P.M. Slight wind but clear skies.

1:30 P.M. R.S. Flicker called. Red-naped Sapsucker has been seen several times to fly from opposite side of swamp across swamp area to base of willows south of cabin on hillside to feed on trunks near base and then fly back again. Shot while after found young in aspen tree designated on Station 3 map.

2:00 Overcast skies with blue showing through hazy atmosphere. Slight wind. Temperature 66° F.

3806 19-148

still lacking material to mount so took gun to spring 100' north of cabin and collected a Eutamias (726 J.B) on same tree as the two were taken at about 11:00 AM this morning. Another one was on tree also.

(727 J.B.) Eutamias. collected on brush pile on opposite side of swamp in aspen. Immature and destroyed

Length	190 m.m.	
Tail	90 m.m.	♂
Foot	31 m.m.	
wt. gr.	43.	

Back to get again until 5:50 P.M.

3:30 P.M. Overcast skies, slight wind with blue showing through hazy sky. Temperature 63° F.

3:35 Watched Lincoln Sparrow feeding at edge of swamp directly below cabin. It fed rather vigorously and quickly and consistently picked off the insects from the tops and sides of the grass blades as well as the ones that might be on the ground and even on water surface. The shallow standing water did not hinder progress, in fact it seemed to be a preferred habitat, walking ↑ to thick shallow pools quite across unconcerned.

3:45 P.M. Gray Headed Juncos fed in grass & sedges at damp swamp edge directly below cabin. Was picking off the insects from the grasses and weeds and accumulated a mouthfull before leaving.

3:45 R. S. Thrush calling from aspen trees. When still chirping regularly. Mr. Heaps of Teasdale called, a herder and knew J. K. W. Brocken when herding on the Henry mts years ago. Heaps is now herding on Aquarius. He reports that two years ago the marmots were unusually numerous while last year they appeared to be very scarce. He attributes this to the hard winter of 1926 and 27. The Coyotes seem to be plentiful yet regardless of biological survey trappering that has been carried on here for many years. This spring a bear was seen at Oak Creek. He saw a brown weasel on road this morning near camp. The mt. Lion are found on the lowlands toward the Circle Cliff area There are sixteen sheep districts on top of mt. He saw a garter snake this morning and reports the Pituophis c. d. as been present.

3:50 Lincoln sparrow feeding on front of cabin at swamp edge. noticed particularly its call and has a chip between a chipping Sparrow and a Virginia warbler. That is between the more vigorous call of the V. warbler and the more plaintive call of the chipping Sparrow. Its warning call is identical to that of canicaps

5:05 P.M. Lincoln Sparrow flew up from grasses to willow then back again into grasses and started to chip. Temperature 60° F.

(718 J.B) Melospiza lincolnii. Testis 11. m.m. in length.

(714 J.B) Passerculus. s. nevadensis. Collected at Torrey but just preparing now. Broke camp at Torrey before I was through so brought it along. but now find it too far gone so destroyed.

Length	123 m.m.	Tarsus	21 m.m.
Wing	67 m.m.	Toe.	16 m.m. ♀
Tail	48 m.m	wt. g.	16

(713 J.B) Passerculus s. nevadensis. Ibid.

Length	129 m.m.	Tarsus	19 m.m.
Wing	69 m.m	Toe	15 m.m ♀
Tail	49 m.m		

Back Collected a Peromyscus on hillside in aspen opening but immature. (728 J.B) (destroyed)

Length.	100 m.m	
Tail	46 m.m.	♂
Foot	17 m.m	

5:50 P.M. Temp. 55° F. Skies clearing, wind perceptibly blowing.

finally through preparation work and will have just enough time to set traps. Planned to set for muskrats & mink around Steep Creek Lake below camp. Lake is about a five minute walk from station. This beautiful lake is snuggled at the base of confining hills among aspen trees and bordered by willow trees. The encroaching vegetation is at once impressive and more so when one knows that it is on the road to extinction and is now only at a temporary stage in its lake cycle. The aspens encroach down to water edge on the east, south & west side while on the north side the hillside is more open and oak replace dense aspen forest. It is normally supported by a spring on the west end but at present is supplemented by water supply that higher up runs by cabin and is diverted around hillside to where it enters the lake on the N.E. side. Large hill slope on west side is responsible for the early evening shadows that creep over its mirror like surface. Set traps along a 300' linear base from west side of lake to north side of lake. As crudely outlined below

the vegetation succession takes on a very definate pattern and is constant the entire circumference of lake. Since trap line conformed to N. W edge will stress set up here. The normal shore line is represent by the red colored water - land contact. Growing lakeward and gradually choking the open water is a rush like growth that is marching progressively from the shore line with a bold and abrupt front. The water is probably a foot or so dep among this sedge like growth. Traveling landward from the water - land contact one finds an area of marsh loving grass upon a supersaturated soil caused by the springs and seeps that issue from their upper limits. This area has a wet soil and standing water in many place and boggy to walk upon. It is on this tippe of situation that the Muscatis runs are found. Willow grow on the higher knolls among this boggy land. Toward the west end of the lake there is a lacking of this supersaturated condition and the water front is contacting the slightly damp short matted grass without the intervening boggy strip. One small patch of six inch high sedge of the broad leaf type iantercepts the supersaturated strip from the mat grass. Beyond the short mat grass one finds the taller grasses that form the vegetation on the hillsides. As soon as the more level land of mat grass meets the more abrupt hillside there is an interesting change. The thick, short green mat grass stops abruptly and the hillside grasses take up where the other ends. At first the hillside grass is small where it intergrades with mat grass but as it works up the hillside and into aspens becomes larger and of greater heights. The contact Zone between water & land is limited and makes ideal place to set traps for mammals are sure to find the bait while passing. This zone is very wet and oozy with dead brown leaves mixed in. Set traps from west end of lake at A. to north end of lake at A' mainly along contact zone and supersaturate strip. While setting traps saw one coot, several male & female Red wing - black-birds, Cabin nest of 3 young and one egg in willow and two Lincoln Sparrows. One of these Lincoln Sparrows was very much concerned about my presence and chipped continuously in the more hidden branches of a willow tree along side of lake. When I sat down on rock for a few seconds it evidently thought I had left, for out it come from its hidding place only to flit back again when it found that I was still near by. When it come to outer branches it did not act frightened but as soon as it recognized me it flew back into bush as if by a sudden reflex. Had nest of 4 eggs. After setting trap line returned to cabin. While sitting around camp fire a large White tailed Jack Rabbit entered open field to south from the aspen covered hillside to the west. It hopped decisively into center of clearing about 100' south from where we were sitting. Stopped here 10 seconds then hopped another 10' and paused then over the hillside and into aspen on opposite side from where it entered field. This incident occurred at 8:30 P.M but could still discern

its characters for identification. no → wind, skies 3806|9-151 clear.
8:35 While around fire heard trap go off in cabin and on investigation proved to be a Peromyscus.
8:40 One of Georges traps went of in meadow by cabin and held a small immature microtis.
10:00 P.M. A vireo (?) kept calling about once every half hour and lent a weird atmosphere to our camp fire.
10:10 P.M. Gasoline lamp attracted a sphinx moth of a grey color. Collected this one and in 10' after its capture another flew into light and was also collected. No wind, few clouds in sky. 48°F. another came about 2 minutes later and collected it also then to bed.

* Station 3 - 6/20/29 Step Creek.
7:30 Shortly after sunup temperature 47°F. Skies overcast and hazy.
8:00 Lincoln Sparrow feeding along swamp edge below cabin.
After breakfast left at 8:40 for Step Cr Lake for trap line and arrived after moderate walking at 8:45 A.M. which is a short 5 minute walk. On arrival heard R.W. Blackbird calling and chipping, flycatcher was seen flying at blackland while in air. No coot in evidence. Eutamias retreated from top branches of willow tree near edge of lake.
Trap line reports starting from west end of lake.
24. Sprung. bait remaining. Placed at lake - shoreline contact among aspen tree and willow. Trap set at water edge on wet mud. Associated with Senna and sedges.
23. (741 J.B) Peromyscus. Caught on lake - shoreline contact on wet oozy mud with black water soaked dead leaves on surface. Near aspens and at base of willow.
22. (740 J.B) microtis m. mordax. Wet grass area 10' from lake shore contact.
21. (739 J.B) Eutamias adsitus. Lake shore contact. Under growth of willows on oozy black mud at water edge.
19. Sprung. Set in runway at edge of lake in grasses around base of willow stump. Dry grasses mixed among the green ones. Tall rush like sedge in standing water of lake.
18. (736 J.B) microtis m.m. In runway among grasses on old willow mound bordering lake edge. Wet areas surrounding. Several holes in mound.
17. (371 J.B) Ibid. except trap set on oozy mud at base of willow clump.
Female R.W. Blackbird carrying worms in mouth. male singing near.
16. Sprung. In microtis runway at water edge.
15. Unsprung. By lake lateral among willows.
14. (738 J.B) Microtis mordax mordax. In runway in damp grasses on opposite side of willows from lake edge. Dire grasses and short sedges both dry land beyond.
13. (783 J.13) Microtis m. mordax. Ibid.
12. Unaffected. Lake lateral among willows in runway with standing water.
11. Unaffected. Ibid.
10. " "
9. Unaffected. Upper grasses & sedges on trail beyond willows 10' or so.

9. 380620-152 (732 J.B) m. m. mordax. Walks edge on trail among microtus ↑ bordering grasses.
7. Unsexed. Walks edge on oozy mud. Walks V rush like sedges lakeward, grasses & willows. landward.
6. Unsexed. Ibid.
5. Sprung. Take lateral among willows.
4. Sprung. Take lateral among willow.
3. " " " "
2. (730 J.B) Microtus m. In supersaturated area among 2" grasses.
1. (735 J.B) Microtus m. mordax. In runway in supersaturated boggy ground 30' from lake edge and near willows.

While on trap line a rail left high sedges of the lake shore and swam across the open water in middle of lake to other side. While swimming across picked up the insects on the surface and offered a sharp call the entire period it was on the water. Am doubtful as to species but looked to me like the Virginia rail although it had a yellow bill like the sora. A Audubon warbler fed in willows along lake edge. Met a negro sheep herder at lake and he informs me that the winter two years ago was extremely cold while this last winter was very mild. This spring he says is backward and is generally windy and cloudy. The feed is growing slowly. In returning from lake to camp inspected oak patch on hillside. The leaves are just beginning to grow and are from 1/2" to 3" long and from a distance have a yellow color. Back to camp to prepare material.

(730 J.B) Microtus. m. mordax. Immature and destroyed.

Length	147 m.m.
Tail	65 m.m.
Toe	19.5 m.m.
wt. gr.	28 m.m.

(731 J.B) Microtus m. mordax. Immature and destroyed.

Length	119 m.m.
Tail	34 m.m. ♂
Toe	18.8. m.m.
wt. gr.	18

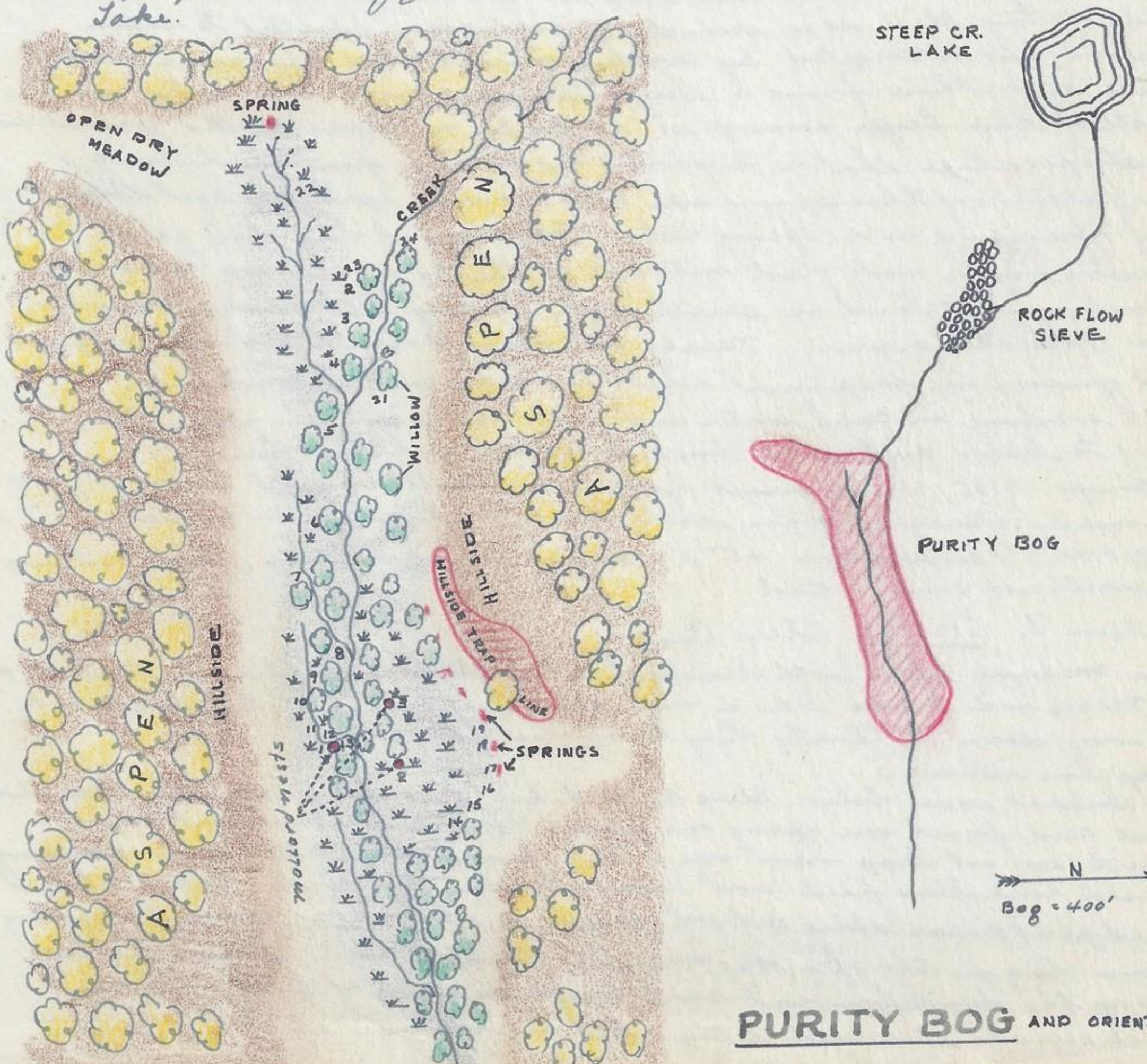
11:00 A.M. From table can hear raven calling while passing by to the east. This morning while attending traps saw vulture flying north above aspen trees.

(740 J.B) Microtus m mordax Immature and destroyed.

Length	148 m.m.
Tail	53 m.m ♂
Foot	21.5 m.m.
wt. gr.	28

(742 J.B) Peromyscus. Caught in cabin about 4:30 A.M. this morning in trap set last night.
11:00 A.M. Lincoln Sparrow has been feeding regularly in swamp below cabin and chiping like juncos. Hauck crew singing continuously since early morning.
(737 J.B) Microtus m. mordax. Uterus normal. mammal fatter than others.
(738 J.B) Microtus m. mordax. Testis 11 m.m.
11:45 A.M. Hummer passed by and paused to feed.
(735 J.B) Microtus m. mordax. Testis 13 m.m.

(736 J.B.) muscles m.m. Testis 11.5 m.m.
12:00 Two vultures circled above aspen trees at camp. Raven flying with them for short distance then turned away.
(738 J.B) Muscles m.m. Six embryos averaging 12. m.m in curled position. One 1/2 as large as the rest. Mammalary glands well developed.
(739 J.B) Cautamus albitus. uterus normal. mammalary glands well developed.
(741 J.B) Primigenus. Testis 7 m.m long.
12.25 P.M. Thrush singing.
12:30 P.M. Lincoln Sparrow chipping in willow on opposite side of swamp. Flew across field to edge of swamp below cabin and commenced to feed.
2:30 P.M. Temperature 68° F.
Finish work at 4:00 P.M and prepared to start out on trap line. Before leaving stepped out into swamp and George found Lincoln Sparrow nest of four eggs. Nest placed in bunch of grass 1' high at base. Nest 2 feet from flowing water and wet soils surrounding. near willows. Nest of dried stems lined with horse hair. 100' feet N. E of cabin and directly east 20' from where sidehill stream enters swamp. Left for trapping grounds at Purity Bog below Steep Creek Lake.



PURITY BOG AND ORIENTATION.

This ~~bog has been~~ given temporary name. of → Purity Bog and has significance in that the water that enters this area has been purified so to speak by being sieved through the rock flow field intercepting its course from its source above. It is a boggy and meadow section of the stream course that has been confined between two parallel aspen covered hillsides. The valley proper is about 180' wide with the stream side swamps & growth occupying the limited area between hillsides. At the extreme upper end of this bog is found a spring that forms wet marsh land on same order as bog below but lack the willow trees. As soon as it enters the main stream that enters from the N.W section. it becomes associated with the willows and higher grasses. This time of year the main stream appears to me to be higher than normal and accounts for the overflow and supersaturation beyonds its channel. Below the convergence of the spring marsh and the main creek the grade is increased and the willow tree become dominant along the stream edge. The grasses and sedges growing among willow and along sides are about 1 or 1½ foot high and occurring in a type of soil that allows one to sink ankle deep and even knee deep in certain places. On the south side of bog there is a secondary wet area parallel to main stream but intercepted by willow growth. On the north side at lower end there forms a larger swamp with high sedge. To the north of this larger swamp is a border of supersaturated ground on a steeper slope that is supported by springs from the hillside. Some sections of this spring area allow one to spring up and down as if jumping on a spring bed. This part of bog had good muskrat signs and had network of trails & runways. Also the secondary wet land on south side of bog had many runways and muskrat signs. Nearly all traps were place in sedges and grasses on peripheral edges in very wet situations. After wading in cold water and wet grass for an hour was ready to leave and was back to camp in short time.
At Camp. 8:45 First small bat in air and seemed to be flying on nearly straight course with some destination in mind.
10:30 P.M. Temperature +5° F, no wind, skies clear, bats calling frequently in air. Bed.

* Station 3. 6/21/38 Steep Creek.

This morning skies with beautiful white clouds, slight wind, Temp 51° F at 7:00 A.M. and looks like a nice clear day ahead. Breakfast and on way down to Purity Bog to inspect traps.
Trap line returns.
1. In wet area below Steep Creek Lake. Last nite I exposed a muskrat nest and found one young one about 1/2 as large as normal sized adult so set trap near near but found unaffected this morning. Passed rock flow field and when at edge of Purity Bog I stopped at edge of aspen along side of stream to observe a Marmot feeding across bog on the open dry meadow at upper end. It was feeding among the dandelions and short weeds in center of field. Every 8 or 10 seconds it would either lift head above short sedges and

grasses to scrutinized the surrounding country. Occasionally it would stand erect for 2 or 3 seconds then drop down again to continue for 10 seconds before lifting head again. It could be plainly seen from my position as it fed back & forth among the grasses. stopping momentarily to check his safety.. Used hands to hold grass and to force vegetation into mouth. Seemed particularly fond of the heads and stems of the blossoming dandelions, especially the bright yellow tops. For some time he took one dandelion every 5 second. Watched for 15 minutes in which time it had covered, in its irregular course, 30' of the meadow. When dogs were heard at distant sheep camp it retreated into the meadow bordering aspens and among the igneous boulder strewn upon the ground.

2. Unaffected.
3. (—) Muratis.
4. Unaffected.
5. Sprung. In muratus trail.
6. (751 J.B) Muratus mordax mordax. In trail of standing water.
7. Unaffected. Runway.
8. " "
9. Sprung. "
10. Unaffected. "
11. (748 J.B) Muratis. In runway.
12. (750 J.B) Muratis. " "
13. (749 J.B) Muratus m. mordax. Trap placed in fresh nest that had been open last night.
14. (752 J.B) Muratus. Submerged runway, trap in standing water.
15. Unaffected. In runway.
16. " " "
17. Sprung " "
18. " " "
19. " " "
21. Unaffected. Dry situation under willows.
22. Unaffected Wet situation.
23 Sprung " " alongside of log.
24. Unaffected. Base of willow near stream.

Trap number of todays catch have been placed on Purity Bog map. Lacking sufficient material from this bog remained and made further observations & collections. Examined several dry grass muratus houses that were placed in sedge & grasses in wet areas. Upon opening one house heard a terrifying buzz and on further inspection found a large Bumble Bee in the entry and lying upon its back. Last night located nest of mallard at base of dead willow with 8 young and three eggs that were pipped. Did not disturb it then but this morning and returned to examine it and found it deserted with only the three empty egg shells remaining. The nest was elevated above water level in depression at base of dead willow tree. Nest entirely of the breast down feathers of adult. Last nite it feigned for a few minutes at 8 feet away. Two Lincoln Sparrows acted as if they had a nest nearly. Fox Sparrow (slate colored) (?) called nervously at base of willows. Forty feet from the first mallard

nest of above flushed a female mallard from nest of seven fresh eggs. While watching this mallard fly away could see sedges moving eight feet away and on inspection found a femak mallard with about 8 young crouching down at the base of 2' high grasses. The young remained with old bird until she flushed afterwhich the young trailed through grass and open water in single file. The ♀ kept feigning at 3, 10 and 15 feet and drew me away from young. Being interested in just what she had in mind followed her across swamp and up dry hillside into aspens for 60' then she left me and flew back to swamps. The nest examined here was made of dry rush stems and placed upon matted rushes at bottom of willow tree. Can hear yellow warbler singing. Examined nest of Lincoln Sparrow in 8" grass in baggy section made of dry sedges (?) and grasses. Bird flushed at 4'. nest held one egg, one dead young and one live young. Swifts continually flew up & down baggy area. Collected (744 JB) N. Cr. Sparrow on willows; had insects in mouth. Collected (746 J.B) and (745 J.B) R.W. Blackbirds, the female had catepillars in mouth. Both very nervous. Collected (747 J.B.) Myiochanes richardsonii richardsonii feeding among willows along creek. Several others were seen setting upon the dry willow branches and darting out to peck insect opet of the air and then returning again to perch. Two Eutamias and a Junco were also seen at Beauty Bay. After making these observations and collections at Bay returned to Camp and on way collected (743 J.B) a Passerculus g. confinis on Artemisia covered bench north of Steep Creek Lake. Another Passerculus gave warning calls at 150' away on same bench and probably mate of this one. Approached within 20' before it flew 15' to stop before flying into aspen tree on edge of bench. They undoubt had young among the sage brush & oak covering this bench. When reaching Camp started immediately on preparation work.

(744 J.B) White Crowned Sparrow. Collected for identification.

Length 165 m.m Bill 11.3 m.m
Wing 78 m.m Toe 16.5 m.m
Tail 72 m.m Tarsus 23 m.m
Sex ♀ wt. gr. 30.

Had mouth full of insects.

(748 J.B) micratis. Immature and destroyed.

Length 134 m.m
Tail 36 m.m ♂
Foot 19 m.m.
wt. gr. 31

(750 J.B.) micratis. Destroyed

Length 161 m.m.
Tail 47 m.m. ♂
Foot 21 m.m
wt. gr. 51

(753 J.B) Peromyscus. Destroyed

Length 133 m.m
Tail 63 m.m. ♀
Foot 15 m.m
wt. gr. 15

(754 J.B) micratis. Immature ♂ destroyed

Length 145 m.m.
Tail 41 m.m. ♂
Foot 21 m.m
wt. gr. 31

(756 J.B) Peromyscus caught in cabin in evening about 10:00 of last night. Need six embryos 5 m.m in curled position.

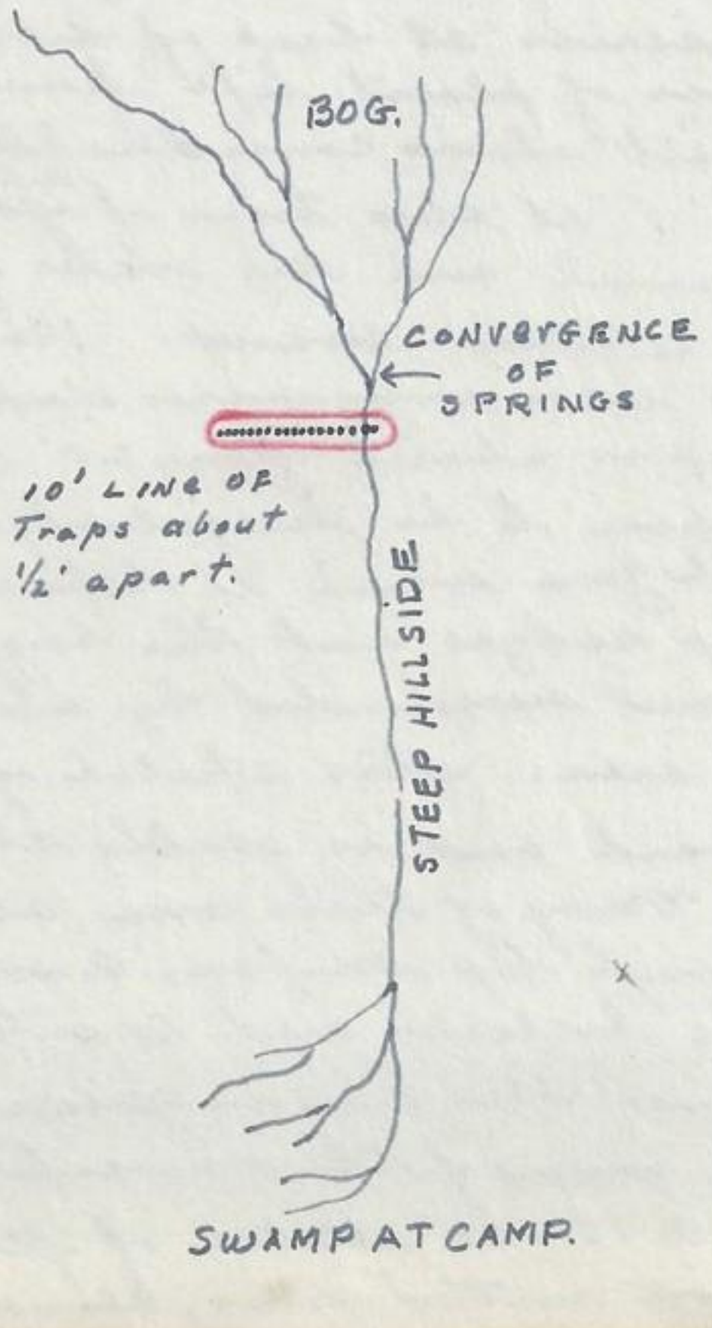
(743 J.B) Vesper Sparrow. Testis 8. m.m in length

(757 J.B) Red Winged Blackbird shot at Steep Creek Lake by Tanner.

L.	222	m.m
W.	124	m.m
T.	94.5	m.m
Tar.	28	m.m
Toe	21	m.m (without claw)
Bill	92	hundredths of an inch
Bill at base	37	" " " "
Anterior of nostral	24	" " " "
Between nostril	16	" " " "
wt. gr.	62	

(752 J.B) Micratis. Eaten around side of head, neck and shoulders. Rather peculiar but the organs of body were exposed and not touched. A Commabelistic master had merely eaten the flesh of above named areas. Caught in runway and the feces pellets on trap ~~left~~ left by aggressor measured 7 m.m ~~body~~ and 1.8 m.m. wide and 12 in number

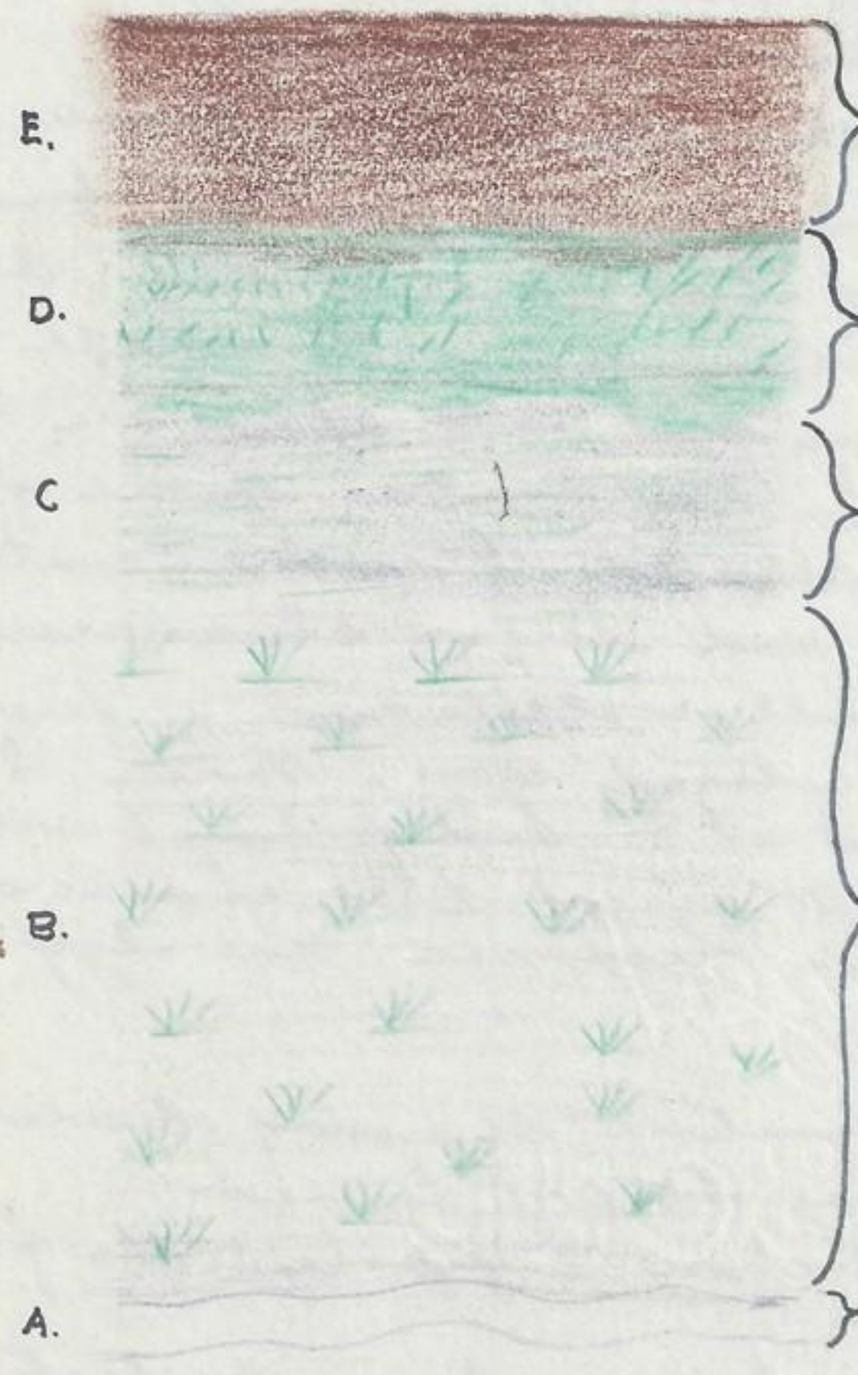
(755 J.B) Peromyscus. Taken on trap barrier experiment of last night. Yesterday evening intercepted the hill side stream that come down mt. side about 100' north of camp. The trap barrier was placed across creek about 200' up hill side at a point on the creek where the stream converges from a boggy and spongy area and then drops down hillside to the swamp at camp. The object being to find out the degree of migration of the micratis & peromyscus up or down this creek stream, so place traps on a line ranging out from creek edge for 10' and traps set about 1/2' apart. The 18 traps on this 10' length should certainly intercept any small animal that chanced to pass by. The creek itself flowed over moss covered rocks and the edges were damp and had moss growth. For the first two feet from edge of water the plant life was directly influenced by moisture of stream while beyond that limit was typical aspen forest. The traps penetrated the aspen trees that covered the entire hill-side. 755 J.B was taken on last trap of line 10' from edge of creek. This morning found one trap sprung on creek edge. Examined this line this afternoon and found that during the day another one at water edge had been set-off. The ants had eaten and carried off the oatmeal bait from the outer limit of traps and as one progressed creekward the oatmeal had been less and less effected until the last two feet of traps the bait had not been touched by them.



(755 J.B) 380621-157 Peromyscus. Destroyed.
Length 161 m.m.
Tail 71 m.m. ♀
Foot 18 m.m.
wt.gr. 28
contained 5 embryos averageing 10 m.m in curled position.
2:03. While still preparing material a Callospermophilus came to steps of front door at 7' distance from table and paused to watch our operations. Stood on hind legs and feet to eat on something held in front feet.
2:30 Callospermophilus returned to door step again and fed on prune stone.
2:32. Vulture flew by.
2:35 Callospermophilus returned and at wheat on door step 7 feet away.
2:42 " " and fed on door step. Tail over back and lying low on board. Fed for 50 seconds.
2:45 Callospermophilus back again for few seconds. and ate on pile of oatmeal.
2:46 " " " and still carried cheeks full of oatmeal.
3:00 Callospermophilus back to feed again.
3:10 Vulture flew by.
3:20 Red shafted flicker fed on ants north of cabin. Green. tailed towhee feeding at edge off open swamp below camp. in same area as is favored by Lincoln Sparrow.
3:30 Callospermophilus back at door step again.
Finished work and after a early supper left camp for Purity Bay to set traps again. On way down observed a lone vesper Sparrow in same vicinity as the one was collected from several days ago. The bench is covered with grasses and small bushes. Had insects in mouth. Arrived at Purity Bay at 7:00 P.M and through by 8:00 P.M. In setting traps tonight had two objectives in mind. One, to trap the larger swamp and spongy edge and the other to checked on the degree of feeding range from their normal swamp habitat, so set first series of museum specials in swamp habitat and the second series at base of hillside adjacent to swamp. The sequence of plant life from creek proper to top of aspen covered hill shows considerable specific variation. (1) Creek channel edge. at this time of year or some other cause stream capacity is greater than normal and the water found on contiguent areas is slightly higher. (2) Main swamp. 1½" to 2' high grasses & sedges standing in water 1" or seven inches deep with much of it in movement. This stripes about from 20' to 30' wide. (3) Willows. While the willows appear to be irregularly distributed in general do conform to a definite zone which is between the main swamp of standing water & deep sedges and the boggy area beyond. The willows are generally islanded and surrounded by standing or boggy lands. (4) Boggy and wiggly area. This stretch of from 10' to 15' is found beyond willows leeward and is gently sloping and being supported by seeping springs. Many of these area allow one to go down 1 foot without going through top surface. a small type of sedge grows here among the hellocks and is interspersed with mosses and a small mat grass. This area in general is a water soaked type of land where many of the muscatis are found. (5) Damp matted grass. a 15'-20' stretch of flat or gentle sloping section with a short matted grass, clover and

and pubescent plant about 5" high association. It looks much like a lawn. The soil is damp but not dry. This area runs up to and abuts against the dry hillside plant association. The contact is abrupt but slight intergradation present. The dry hillside grasses invade the matted grass plant association for about 6 feet ~~last~~ becoming smaller & smaller due to competation and too much moisture and finally end at the surface line as being only an inch or two in height as compared with the foot high grass of the hillside. (6) Hillside association. It is covered with lava boulders a few small oak bushes and other small plants & bushes. The ground is dry and shows the feet imprints of Eutamias (?) Aspen grow upon this hillside. Throughout the hillside are found numerous holes under rocks and along their sides. Most of the second series of traps were placed near matted grass & hillside contact only a few feet from likely muratis territory in some cases. Ranging from 4' to 45' up hillside and along a 150' base line bordering swamp.

The first series were placed in zones A. B. C. and particular in main swamp - Boggy slope contact where standing water meets the saturated soils supported denser grasses and the numerous runways. The main swamp was not a favorable area because of deep water but near boggy slope contact where tall sedge became more matted and the water became shallower the muratis signs of chewed grass stems and runways became more in evidence. Was interested to know to what degree the muratis crossed the matted grass area and how far might wonder in cold tell. Located that were located but three egg shells still remained. The three mallards nests, so far, form a triangle with 40' between the three points of the pattern. It is rather interesting in that there is three stages represented, fresh eggs young just hatched and old abandoned nest. It may be possible that one male controls the three birds or they might even join



up the hillside association area they their nightly activity. Tonights trapping old Mallard nest 40' from other two nest previous. It was deserted and disrupted still remained. The three mallards nests, so far, form a triangle with 40' between the three points of the pattern. It is rather interesting in that there is three stages represented, fresh eggs young just hatched and old abandoned nest. It may be possible that one male controls the three birds or they might even join

for companionship. The nest of fresh eggs located this morning had no attendant present + eggs were cold. Leaving Purity Bog and returning to camp. at 8:25 can see evening star (?) in western skies with mallard duck flying past on its way to Step Creek Lake. Heard Bats at camp this evening. Has been a wonderful day with little wind and clear skies. It was first day that allowed us to see distant points to the S.E. over desert country. The previous days had been hazy. Now at 11:45 P.M the stars are brighter than usual, no breeze and lonely solitude. Temperature 43° F.

* Station 3. Step Creek. 6/22/38.

Up at 7:00 A.M. Beautiful day with snowwhite clouds sailing to the east. after breakfast left for Purity Bog to gather material from last nights trapping. On way down at bench just north of Bog revisited a Green tailed Towhee nest that we run across when returning to camp after setting traps. Last when flushed from nest flew 120' in a direct course and lit in a service berry bush and commenced calling. While we examined nest the bird described a half circle about us and finally worked into aspen tree 20' away from us. During the entire it offered its characteristic cat like meow. Another Green-tailed towhee responded to calls about 150' in direction the nesting bird flew the first time. Nest on top of hill north of Bog. The end of this moranic like bench is covered with small individual clumps of service berry and oak about 1½' high. Grasses were found sparsely between the bushes. In one of these clumps 1' high the nest was located. Placed in center and made of dry yellow grass stems and larger stems around peripheral edges. Lined with small rootlets and a few horse hairs. Contained 4 normally colored eggs. When I visited it this morning it flushed at 4' and followed same sequence of behavior and route as date last night except that it was not as nervous or aggressive. No male response. One egg hatched since last night.

Trap line returns on hillside association beginning at west end of trap line and following east along base of hillside.

18. Unaffected. Under rock protection 8' up hillside from matted grass contact.
17 Unaffected. Base of boulder 4' from mat. grass contact.
16. " " " " 6' " " " " "
15. " Entrance of hole at edge of rock 8' from mat grass contact.
14. Unaffected. Edge of boulder in contact between hillside & mat grass. 4 feet from bog and 20' from swamp proper where several insects were taken yesterday.
13. Unaffected. Entrance to small hole 8' from mat contact.
12 " " " " 6' " " "
11. Unaffected. Same as 14.
10 Unaffected " " "

9. Unaffected. Entrance to hole. 6 feet from ~~bog~~ spring.
8. " Entrance to hole 4 " " " " "
7. Unaffected Base of rock 10' from mat grass. 20' from water edge.
6. (763 J.B) Peromyscus. at entrance of hole 30' up hill side from mat-grass contact.
5. Spring. At entrance of hole between boulders. Cutanias seen in this vicinity.
4. Unaffected. 45' up hillside from hillside association-mat grass contact.
3. Unaffected. " " " " " " " " " "
2. Spring. 45' up hillside.
1. Trap gone. 45' up hillside among large boulders, service berry and oak. The isolated hillside grasses were small. Museum specials in marsh area directly below. With the trapping on contigent hillside have a pretty good record of their occurance and movement among the different association found at this point. The whole are including hillside would be about 150' from creek edge and 200' paralleling creek. or an area 150' x 200'.
1. Unaffected. In grasses 6" high. closer, massed; black mire and standing water. 1' to 6" high sedges. Six feet from edge of channel at base of willow.
2. Unaffected. Boggy slope at base of willow. In trail among grasses 8" high.
3. Unaffected. At upper end of spring abuting against hillside association with matted grass stripe 1' wide. In trail among short grasses with water in runway.
4. Unaffected. Edge of swamp at contact with boggy area. Water in runway.
5. Unaffected. Boggy area - swamp contact. Grasses 2'.
6. (760 J.B) Microtis mordax-mordax. In swamp 4 feet from bog contact. Grasses 2' high with dead dry grasses mixed among them. Black mire with standing water just beginning. In trail.
7. (758 J.B) Microtis. Bog and swamp contact. In 2' grasses with mixture of bog association. Hillocking topography. Water in trail.
8. (762 J.B) Microtis. In same runway as above.
9. Unaffected. Swamp.- bog contact, deep grasses, mire and standing water.
10. Unaffected. Bird.
11. " " and additional chewed green grass stems in trail.
12. Unaffected. Upper boggy area in runway with no water surrounding. Grasses 1' high. Ground damp but not wet.

13. Unaffected. Boggy area but no standing water on trail. Grasses 4" high.
14. Unaffected. Bog - swamp contact.
15. Unaffected. Swamp strip. Grasses 2' high. Mound of green grass stems chewed along side of trail on black mire.
16. Unaffected. 3' from above on water runway.
18. Edge of willow on swamp. Deep water, grasses 2' high.
17. Unaffected. Same as 16.
19. Unaffected. Channel edge among willows. Grasses 2' high
21. Unaffected. Same as above.
22. Unaffected. Along channel edge on grasses 2' high. Standing water at black mile.
23. Unaffected. Same as above.
25. Unaffected. " " "

The second mallard nest located had 8 eggs this morning while only 7 had been lain last nest when nest was found deserted. The nest is on grasses & grass 2' high in standing water 5" deep. Nest elevated 8" above level of water. Made of same material as grasses but dried, some however being green. Outlet to east. Willows in background.

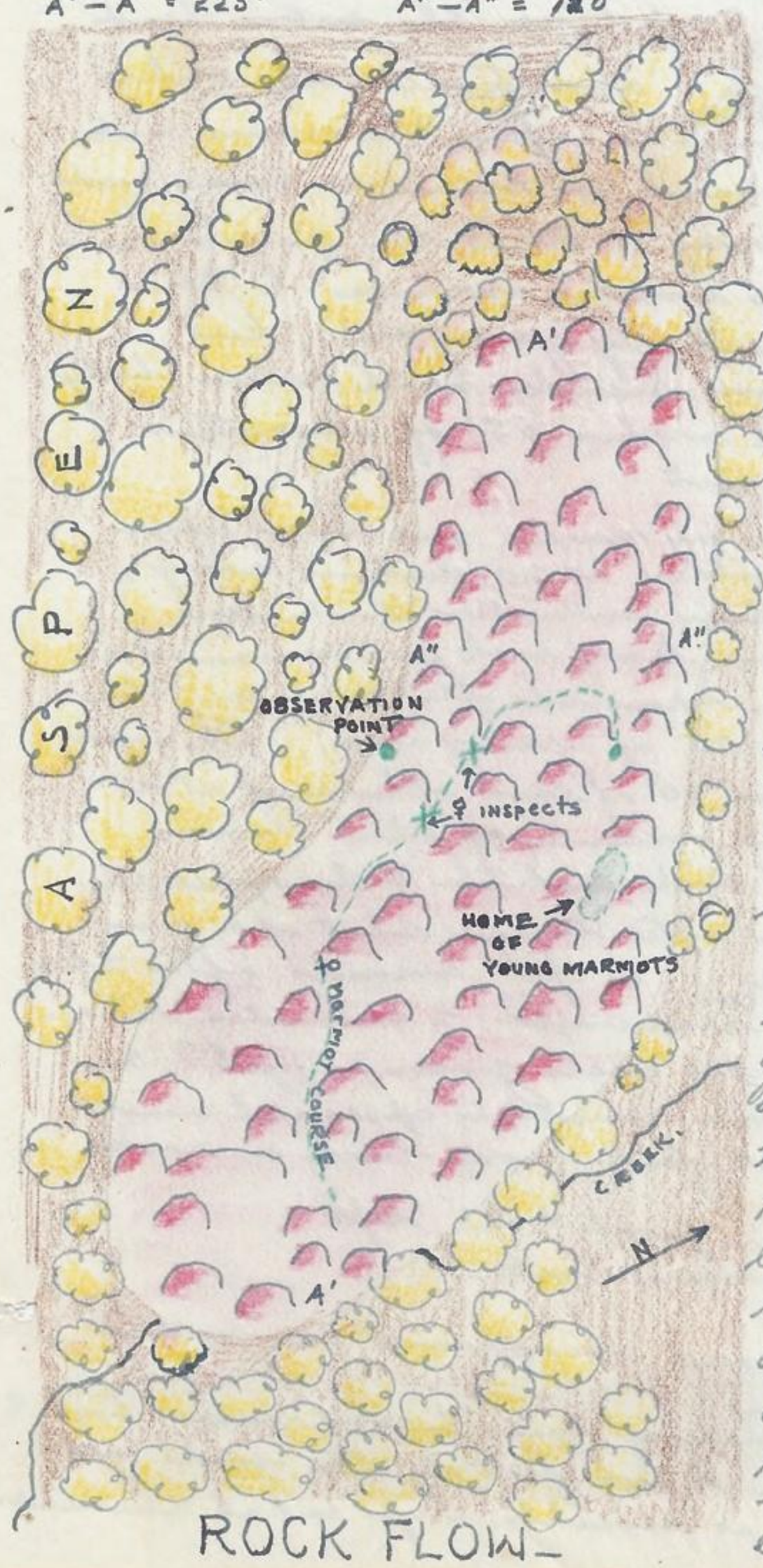
Located nest of Hammond flycatcher (?) in swamp 30' east of last date. mallard nest. Nest placed in dry and dead willow bush, four feet high from standing water and 2' sedges below. Outer covering of dry light colored plant fibers, inside lined with small brown rootlets and white horse hair. One white feather inside. Flushed first last night and it returned at 2' from hand several times and chipped continuously. This morning no bird was on nest. The eggs were creamy white without any marks and 4 in number. The flycatchers seen at bog all appeared to me to the the W. Wood Pewee and the one collected was Myiochanes r. richardsonii and while the nesting bird looked like one of the birds seen flying about her eggs were not of the Wood Pewee. George and I located another nest of Hammond Flycatcher (?) 200' west of the above and in dry willow 20' from stream edge. Nest similar and had 4 eggs. Nest 8 feet high in center of growth. The Hummer, House Wren. Lin Sparrow. S.C. Fox Sp, and R. W Sapsucker and Blackbirds (R.W.) were also seen here this morning.

Left Purity Bog for camp. At a point where creek enters Purity Bog from aspen is a small patch of boulder among the aspen trees. Approached within 60' and sat down to see if Marmot would return from boulders. 3 minutes later it came upon rock for a few seconds then disappeared again. One of the boulder measured 10' x 10'. Aspens on all side. Numerous pellets among rocks and probably represented permanent area of habitation.

380622-162

at about 20' from east edge of boulder patch I examined a spring that was surrounded by a yellow mossy growth like iron stain from artesian well but appeared to be organic. An aspen tree at this pointed that had fallen over measured 33" in diameter at a point 4' from butt. Leaving this area 10:20 A.M. followed up creek to edge of large boulder field. (boulder seive) and on approach saw a Columbian scavenging over rocks. Worked around west side to a point where I could set down and have entire boulder field in view. George stayed back at lower rock patch to see if he could collect a large Marmot and while waiting made a few observations of this boulder field habitat. This sloping boulder field is a very unusual site, having course and rough features that ale in direct contrast to the delicate bordering aspen and aspen covered hillsides & meadows beyond. It may have represented an old rock flow of geological times and since then the vegetation & trees have replaced much of the original flow and this small section is all that remains. The aspen trees and soils approach the peripheral edges but beyond there is an absolute lack of any green growing thing and all this present is an accumulation of large igneous lava boulders. The individual rocks range from 8' feet in diameter down to boulder no large than ones head, all being on some surface levels and with unlimited depths before the aggregation of boulders reach a solid foundation. Would not be surprised that the entire slaping surfaces of the aguarus mountain are underlain by these large boulders that have accumulated either due to rock flow or from glaciers bringing them down from above. As one follows down from the top of the Aguarus he finds first the source being represented by the lava cap, then rock flow areas and terminal glacial deposits, then lava down the creek washed boulders and at the base of mountain and far into the desert the rounded creek worn boulders that have been deposited during flood water stages.

A'—A' = 225' A"—A" = 120'



ROCK FLOW—

3 80622 163

These boulders here however are not creek or water worn and represent a flow accumulation. Regardless of the decided contrast between the rough surfaced area and the gently sloping adjoining hillside the boulders seem to blend into the surrounding because of the varied colored lichens of white, black, brown but predominately green. These lichens practically subdues the original red andesitic lava boulders. The patch has a gradual slope from its west end to its s. east end rising more abruptly however at its upper hillside contact. Beyond it west side the hillside rises more abruptly and is covered with soils and normal vegetation while to the east of its lower end the hillside terminates in a long bench like formation. Sat here at the edge and watched for several minutes before four young marmots (1½ as large as parent) presented themselves. At first I saw two heads with just their ears and eyes peering over the top of the rock.



With a little more confidence the entire head was thrust above the rock.



and finally the entire body was elevated in a resting position upon the warm rock.



Continued and erect.



10:30. Female arrived on scene 40' away and 80' from young ones. First she peered over top of rock in a similar manner to the procedure followed by young ones, but finally stood upon boulder with entire body erect.

10:33 Female moved within 25' of observation point and stood erect

10:35 Moved across in review and stood again erect on top of boulder at 20' distance away, then after inspection intruder took her station 80' away on top of rock and remained in a reclined position upon the flat surface. She was now within 30' of young ones. The young ones kept within 10' of each other and at no time did they leave the immediate vicinity of their home.

10:37. George arrived at lower end of slide and the ♀ disappeared. but the young ones remained even after George shot at a young chipmunk at lower end of slide. A few seconds after this shot they left top of rocks but (one) reappeared 2 minutes later. for 20 seconds then left again. No calls given as yet. One minute after disappearance of above, another appeared and remained and 30 seconds later all four were back on rocks again.

10:42 George arrived at observation point & all left

10:44 One young appeared & rested upon rock.

10:48 ♀ appeared then retired.

Marmot passed 10' infront of me and disappeared among the rock chasm beneath for inspection.

10:54 ♀ and all young are now resting upon tops of rocks but ♀ still 30' from young ones. They are lying flat on the rocks with abdomen covering as much surface as possible. Legs out at the side.

380622-164

The wind blew intermittently and air cool and found myself hugging the boulders for the same purpose as the mamat; to recieve the greatest degree of heat from the warm boulder surface. Young remained on top but maned around occasionally.
11:10. Left observation point to get closer position to photograph them. Remained in center of rock field for 11 minutes but they did not reappear. Before leaving collected a Sitta carolinensis nelsoni (765 J.B). Flew first out of aspens just south of me at edge and across entire length of field to south end where it lit in aspen. Followed it and when I arrived at south end it flew back again over same course as it used when flying to the south end. Laboriously jumping from one rock to another I returned to north side of rock field and just as I arrived it flew south again over rock field to South end of slide where it began feeding on the aspen trees. I returned over same course and found it feeding on a dry aspen and collected. It may have had young at the north end of rock field.. While crossing the boulder on the above chase almost stepped upon a rock wren. Rather than escape by flying up over the rocks it chose to dart down among them. Before me left the area three hummers had paused infront of me to satisfy their curiosity. One flew over boulder patch and directly into aspen grove among the lower branches at full speed. Left Rock flow scene and returned to camp via Steep Cr. Lake. Investigated Smooky Sparrow nest that had been located on the evening of the 19th. It now had four young and the parent bird was standing on edge of nest sheltering the nest & young from the sun rays. Stood right over nest before parent bird left. It flew into willow 15' away and chipped in similar manner as experienced on the 19th. The nest so located in wet boggy ground at base of bunch of grass. The young have hatch about the 20th & 21st. Left S.t. Cr. Lake and wasted no time in returning to camp for the morning was passing and considerable work to do.

(758 J.B) Microtis. Immature & destroyed.

Length	113 m.m.
Tail	28 m.m. ♂
Foot	17 m.m
col.gr.	10

(759 J.B) Peromyscus. Immature destroyed

Length	115 m.m
Tail	53 m.m. ♀
Foot	18.5 m.m

(766 J.B) Peromyscus collected in cabin early this morning about 3:00 A.M.

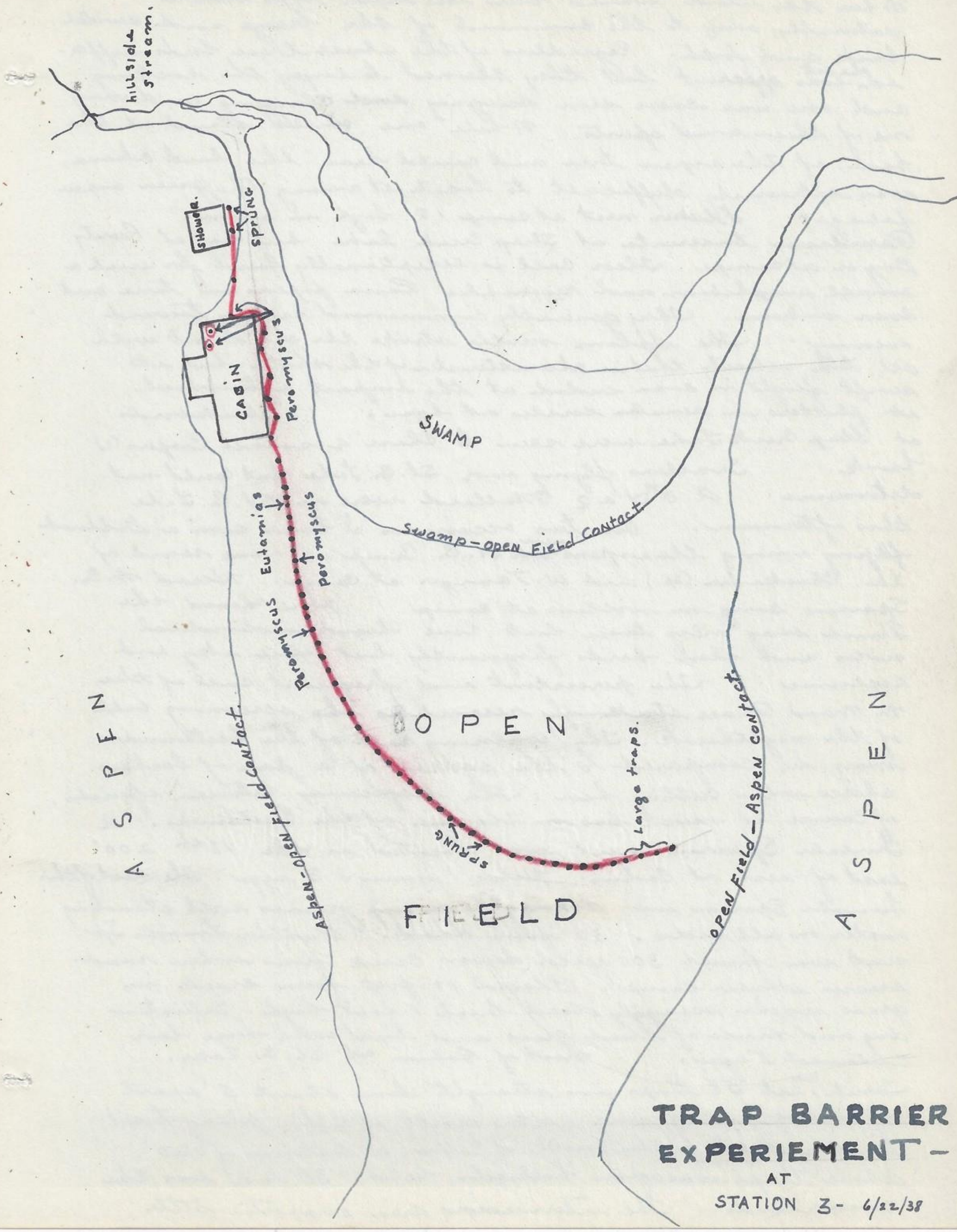
(760 J.B) microtis monday monday. Eight embryos averaging 12 m.m. each. One arrested embryo 4.5 m.m. long

(763 J.B) Peromyscus. Skin skipping.

Length	148 m.m
Tail.	66 m.m ♂
Foot.	19 m.m
gr.wt	15

At 5:30 P.M made temperature recording in open field south of camp on rack in direct sunshine and then made recording 15 feet west of this first recording among the growing shadows from the aspen trees to the west on hillside. Sunny situation 106°F and shaded area 66°F. Both recordings made in same open field but intercepted by shadow edge.
At 7:00 P.M. two Robins were seen copulating 20' from nest of one egg. 200' north of Camp.
7:45 Vireo still singing, Pewee calling & R.N. Sapsucker hammering near camp.
8:55 P.M. Poorwill (?) began caeling north of cabin and continued for 1/2 hr.
8:56 Night flying butterflies brown colored began flying and by 9:15 P.M we had collected 5 inside cabin but one outside cabin. They were found either flying about cabin or resting upon screen or wood walls although have a more photostatic preference for screens. One flew out of door and into air. It began climbing but soon come down more abruptly than it had gone up. being unable to keep self in air. Was collected on ground. No wind flowing and temperature 52°F. Skies clear. at late afternoon the skies were clouded and wind blew tops of aspens vigorously. The butterflies did not react to gas lamp that was burning 30' away at edge of swamp. 3 or so dozen small common moths were associated on inside screens with this Lepidoptera. Today is the first time we have seen these Lepids. They had moth-like colors but had butterfly movements
9:30 P.M. Temperature 52°F. No wind, skies clear. This afternoon about 2:00 PM large white clouds formed but at sundown disappeared.
11:00 P.M. Sphinx moth reacted around gas lamp in usual manner and was collected during its senseless fluttering on ground after it hit lamp. Temperature 48°F no wind skies clear. Before going to bed recorded a few miscellaneous observations made during the day:
Fifteen vultures were seen above camp ~~and~~ I on one flock this morning. Two other groups were seen one of six birds and one of 2 birds. Toward evening two R.N. sapsuckers become very active and more than usual. One would approach the other which would fly away & through the aspens with the other in pursuit. for about 50'. They continued hammering among the trees at some resounding log later than normal and stopped at 7:30 P.M.
Studied Vireos this afternoon. From the cabin could hear five vireos that seemed to favor one area of aspens and whenever they called would be in same tree or alternate. One bird in back of camp had two tree under-control at about 100' apart. Whenever this bird was seen to fly across opening it would either alight in one or the other sentinel trees or one

380022-166



TRAP BARRIER EXPERIEMENT -

AT

STATION 3 - 6/22/38

380622-167
associated with it. → Those found singing were generally found about 2' from top of tree or even on tip top. When the wind would blow the aspen tops would naturally obey to the command of the breeze and switch back and forth. Regardless of the abuse these birds suffered the act was apparent but they seemed to enjoy the rocking and one was even seen singing and clinging on during one of these wind spurts.. While one could stand at the base of the aspen tree and could hear the bird above, was extremely difficult to locate it among the green aspen foliage. Fletcher nest at camp 15' high in aspen.
Pseudacris triseriata at Slep Creek lake but not at Purity Bog or at camp. Their call is exceptionally loud for such a small amphibian and resembles Rana pipens in tone and even volume. They generally commenced calling toward evening. The Sphinx moths strike the gas lamb with all the velocity that is characteristic of the moth but its swift flight is soon ended at the impact afterwhich it flutters in senseless circles at base. Blackbirds at Slep Creek Lake were seen to chase a small Coopers (?) hawk. Swallows flying over St. Ca. Lake but could not determine. A ♂ & ♀ Mallard were on St. Ca. Lake this afternoon. On two occasions I have seen a Gyrfalcon flying among the aspens near St. Ca. Camp. Have record of the Chickadee (Sp.) and W. Tanager at Camp. Heard Sw. Sparrow song on willows at camp. Have heard the Thrush song only twice but have heard individual notes and seen birds frequently but were shy and secluisive. The persistent and frequent call of the N. Wood Pewee strikingly resembles the screening call of the nighthawk. The warning call of the Eutamias may be compared to the squeak of a pair of barbers shears when cutting hair. The frequency between squeaks, of course is much less in the case of the Eutamias. A Lincoln Sparrow nest was located on the 18th 200' east of nest at Cabin. Held 1 young + 3 eggs. The nest of this Lincoln Sparrow was among the swamp grasses with standing water on all sides. 30' from road. Another Lincoln Sp. nest was found 300 yards down creek from where road crosses it near Camp. Placed 10 feet from creek in grass under scraggly dead bush 1 foot high. Setuation dry and made of dried grass and lined with horse hair. Contained 5 eggs. Nest of Robins at St. Ca. Lake.
Tonite we set 58 traps in straight line about 5' apart extending from spring water north of cabin, along trail to open field to the south of Cabin, a distance of 120'. Above traps was open hillside, below 30' to 60' was the swamp lands. The intervening area supporting little

vegetation particularly the open field. 380622-168
→ Part of the trap-
line intercepted the front of cabin. Baited with oat-
meal and connected all traps with line of bait.
The area is typically hillside type of vegetation with grasses
sparsely distributed. The object to this was to determine
the ranging habits of the peromyscus and to find
out what animals may pass from aspen tree down across
open field to swamp below. By 10:30 three trap were
sprung the last one being at 10:30 P.M. which was a
Peromyscus and caught under cabin. The other two did
not hold anything but were sprung. Made my last
visit along trap line at 11:00 P.M without any further results.
and then to bed.

* Station 3. Steep Creek 6/23/38.
Checked trap line first thing. Out of 58 traps
Caught: 1 Eutamias.
5 Peromyscus.
4 Sprung.

Three peromyscus were caught in cabin, one sitty feet
south of cabin and one between about 20' from swamp
and 30' from aspens. Chipmunk 20' from cabin. Two
traps were set off at slaves house north of cabin.
Prepared these and prepared for trip to upper lakes
at base of Lava Cap.

767-J.B Peromyscus. Skull only. One of the above.
768 J.B " " "
769 J.B " " "
770 J.B " " "
771 J.B " " "
772 J.B Eutamias " "
767 JB Peromyscus Skull only.
Length. 152 m.m.
Tail 63 m.m. ♂
Foot 19 m.m.
wt.gr. 25

768 J.B Peromyscus. Skull only. testis 9 m.m
Length 150 m.m
Tail 65 m.m ♂
Foot 20 m.m
gr wt. 21

769 J.B Peromyscus. Injured tail. Skull only. Testis 9. m.m.
Foot 20.8
gr.wt 21

770 J.B Peromyscus. Skull only. Uterus normal but slightly enlarged.
Length 164 m.m
ok→Tail 75 m.m. ♀
Foot 21 m.m.
gr.wt. 28

380623-169

771 J.B Neromyscus. Skull only. Testis 8. m.m.

Length 150 m.m. ♂
Tail 68 m.m.
Foot 20 m.m
gr.wt 20

772 J.B Eutamias Skull only.

Length 215
Tail 97 ♀
Foot 32
gr.wt. 62

After measuring and taging skulls made final preparations for overnite trip to the Lakes below Bowns Point. The objective was to make a full days observation on this vicenity, and then trap the area that night. George was to relieve me the next day. In this manner, one man would be in the field at these lakes the entire 24 hours of the day, taking notes during the day and trapping at night. I was to return tomorrow morning to camp where the material and prepare it that day while George alternated duty upon the mountain. Equiped with sleeping bag, tent, traps, bait, and food for lunch, supper and a snack for tomorrows breakfast got away from Sheep Creek Camp at 9:30 A.M. Skies clear, slight wind. Palmer drove Dr. Beck, George and myself to a point six block east along main road where we left him and proceeded up to the ridge leading west to Bowns Lake. While working up to ridge from road passed through open clearing on sidehill. Here the bunch grass and curley grasses were dominant. The green part of the bunch grass was 1' high while the dried seed stems were 3' high. The curly grasses were all short and matted the surface of the side hill in irregular patches.

9:40 A.M. Turkey Vulture flew by. Utah Jay calling and scolding; 2 vireos heard singing in aspen. Numerous grasshoppers in open fields. Penstamens being severly effected by the flea beetle.

9:47 2 Vireos singing 200' apart. Robin singing

9:48 Juncos flew up from ground into tree √ chipped as if quite concerned. Dry ledges covered the soils beneath the aspen trees.

9:51 Thrush singing. Among the aspens now and find the Penstamen, sweet pea and bunch grass dominating the flora below the aspen trees.

9:52 2 vireos singing. Chipping sparrow calling lacent-like.

9:56 Marmot den among boulders of rock flow with aspen trees entirely surrounding. The elderberry, chokecherry seem to favor the rock slide edges. The rock flow area looks as if nature had a bilious spell and spewed up these large boulder aggregates from below. The country we are now passing through is a south exposed hillside with aspen trees covering the surface except for a few boulder strewn opens and small clearings

Examined a willow that had been girdled on one side with long perpendicular teeth marks preserved on inner wood. Did not have the characteristic pattern of porcupine and so assumed that it was work of Marmots living in rock slide 150' away. The Oregon grape found among the aspen and in open field is, in some cases. 1' high. One patch of elderberry measured 100' x 150' and another 20' x 20'.

10:00 A.M. Saw first Cautamias. Vireo singing.

10:15 Vulture flew by. Stopped 10 minutes to look at panoramic view below across the desert country below.

10:26 Now at head of canyon leading north from camp. Can see cabin among the aspen. At this point there is a flat plateform at edge of canyon head that has a elderberry patch 100' x 80' and several flowers of the elderberry were in blossom. 3rd Cautamias seen here. Leaving canyon head and working up hill over series of flats and openings. We soon arrive at the edge of the glacial plateform and Bowns lake must not be far away.

10:40 Two Vireos singing 200' apart. One tahoe flew through aspens.

10:45 Bowns Lake. Stopped a few minutes at south side and while here heard the song and calls of the Vireo, Hummer, Robin, Thrush and three Pseudacris.

11:00 Leaving Bowns lake and bearing N. W.

11:10. Nuthatch calling.

11:18. Hidden lake (?) James feeding among boulders at edge. The dandelions on hillside here are 1 foot apart.

11:25 Now dark thunderclouds overhead and trailing a black horizon. Working up hillside west of lake. Fresh gophers holes. Grasshoppers copulating. The conebo bees, Tachinids, Syrphids. Syrnoptelus, Sphecids were on hillside. Clarks Crow calling from above. The clouds now appear as if they were lost as to direction. Beside the eastern movement of the high thunder clouds there is a northern trend of the lower clouding whirling and twisting themselves in every direction. Arrived at top of ridge of Spruce and fir and then descended west slope to bottom of small valley; hence south then east to top of north south trending ridge again. This N. S. trending canyon is extensively forested with spruce and fir and it was among the live and many dead trees that we now a congregation of Utah Jays, Clark Crows and R. Mt. Jays. seemingly gathered in convention. When at south end of N. S. trending ridge could hear Pseudacris calling below and we knew we were in vicinity of our selected trapping area. Started to hail at 1:00 P.M and let up at 1:20.

1:30 P.M. Arrived at camp site one hundred feet north of Private Lake. so named because of the many bathing boulders found throughout its bed. and because of its

occurrance in the Loup territorial limits that were set as being necessary for the privacy of the Lakes tent. While setting up Camp lasted for 12 minutes from 1:40 to 1:52. By 2:00 P.M the Camp took on a respectful appearance and was then time for trap line. Dr. Beck & George left me at this point and planned on going to the top of Aquarius at Bowns Point. They started out in what appeared to be threatening storm of the thunder. lightning type which would probably not be too safe to be misted up in especally with lightning striking on either side of one among the ridge above. The area near the Private Lake Station includes Survivor Springs, Lone Spruce Spring, Stranded Lake and another wet meadow below the Stranded Lake meadow which so given the name of Brink meadow and springs. There are all small lakes and meadow land found upon the glacial plateform and are associated with the expansive aspen growths. Stranded Lake is 100' south of station and appears to have no intake or outlet. The most characteristic feature of this lake is the numerous large boulders that are distributed throughout the lake, especially toward the north end of lake. Survivor springs is to the east of Private lake and issues ice cold water. About 200' below the course of this spring the water leaves its marsy covered bank and large & stunted spruce and flows down a steeper grade until it finally reach the open Clearing of Stranded Lake. The lake here is pushed off into the N. E corner while Lone Spruce Springs take their position on the west side. Below the Stranded Lake meadows is found the Brink meadows. In reconnaissance on our trip this morning found difficulty in finding suitable trapping areas. This area we are now located is very satisfactory at least from the indications in evidence. The Private Lake Station & immediate meadow lands below, lie intermediate between the lower flat aspen covered glacial plateform and the higher Spruce stands below the rugged Andesite lava capping of the Aquarius Plateau. The trees here are dammately aspen but find a mixture of Spruce and fir from the invading Spruce stands above. The ground is typically sod with openings like savannas. Covered with grass. Beneath the aspen trees are found the delicate aspen protected forest floor of sweet pea, 1' to 1½' high & just beginning to blossom massive and completely covering the surface. At many points the gently rolling surface of the terrain is interupted by patches of rock flows and terminal moraines but completely surrounded by aspens or spruce.

Set trap in wet meadows below. First series along the banks of the stream below Survivor Springs for 300'. Here the stream is crystal clear and the associated vegetation and Spruce looks

BOWNS POINT

AQUARIUS
PLATEAU
(BOULDER MOUNTAIN)

380623-171

INVASION CANYON

BOWNS LAKE

COOT LAKE

PRIVATE LAKE
STATION 4
SURVIVOR
SPRING

WEST DEER LAKE

LONE SPRUCE
SPRING

STRANDED LAKE

BRINK MEADOW

DISAPPOINTMENT LAKE

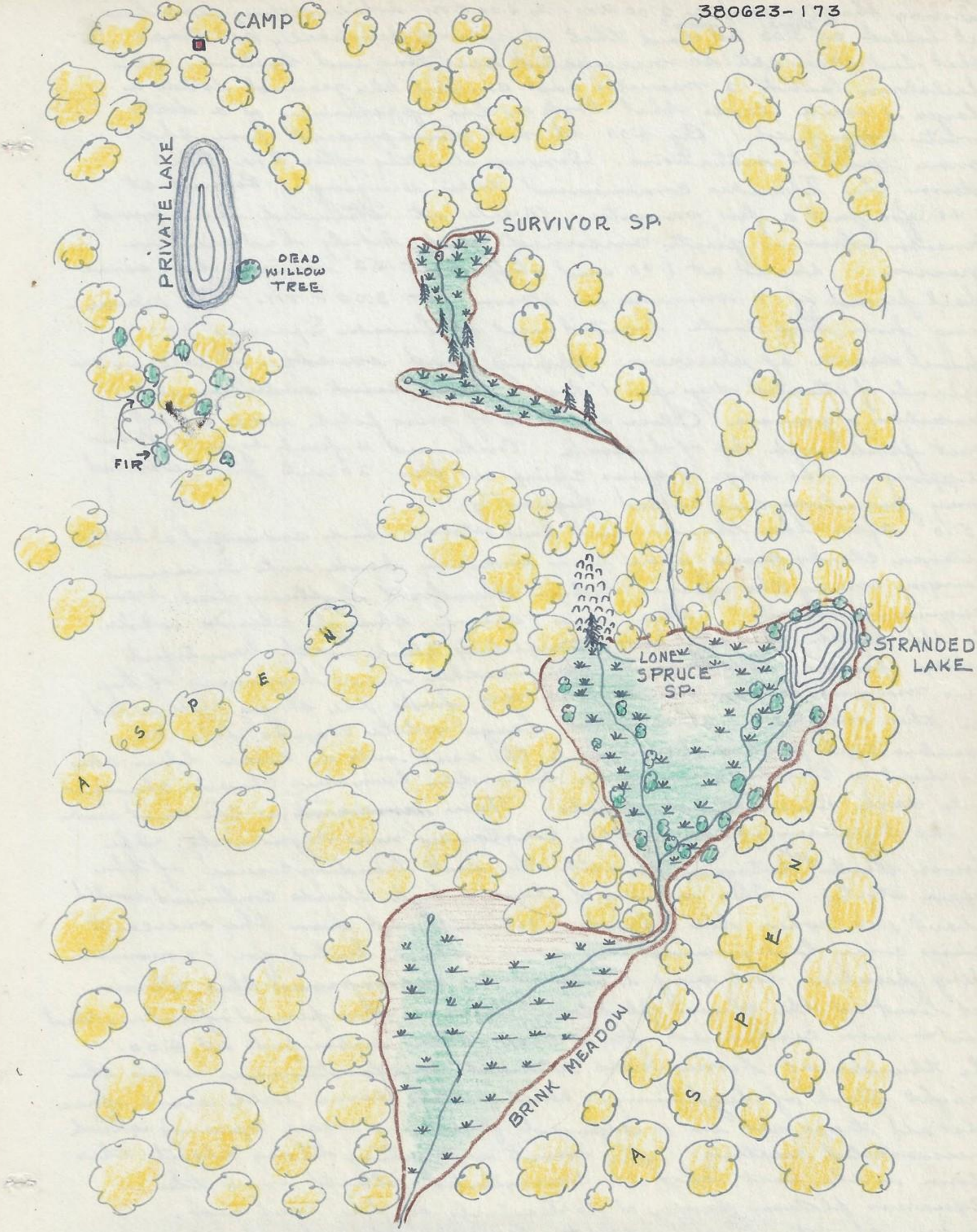
(Edge of Glacial plateform)

STEEP CR. STATION 3

380623-172

like the stream side associations found in the higher Hudsonian zone. The spruce tower 60'-90' feet or more into the air while beneith the stunted one grow laterally and bush like in shape. The edges of the spring flow are mass covered and area wet. The spring that enters from the west side about 150' down stream from Survivor Spring has grass & sedges growing along its edges. Survivor Spring receives it name from the fact that it has survived even after Invasion canyon had sapped its normal drainage from the Aquarius. This spring and meadows below are evidently found on the course of an old glacier bed that once passed down the canyon. directly N.W of Station from the Aquarius beyond, and since the glaciegeal past when the glacier flowed, the Invasion Canyon has intercepted the head of the once S.E trending and continuous glacier band. The second series was placed in meadows at Lone Spruce Spring and Stranded Lake. Lone Sp. Springs issue from the base of a rock flow patch and flows across the open meadows of grass and sedges (?) with willow clumps dotting its surface. At the lower end of the rock field is found a dead lone spruce after which the spring receives its name. On the east side of this meadow is a small lake nestled among the crowding willows, aspen & fir. Large lava boulders line its edges. The water is clear and in west end in shallower depths the water grasses seem to be invading. This entire meadow may have been a lake at one time but has been silted in by the stream that enters from the north. The lake has been crowded to the N.E corner and now becomes stranded with its outlet along the S. E side of meadow. At most any point on the meadow one can gain by jumping from one boulder to the other among the water loving grasses and willow bushes. Aspen trees border the entire circumference of meadow. The third series of traps were place in Drink meadow found in same water course as Stranded Lake and receives its name from the fact that it is on the threshold of the glacial platform and beyond its edge one looks down long meadow clearing that courses down the Aquarius slopes. It has a similar appearance as the above meadow but lacks the numerous boulders. More typically meadow. As above the aspen trees border meadow edges. This lake also may have been a lake in the geological past. After setting out trap line returned to Station and remained near at hand to record complete activity of Pseudaeris and to make observation around Private Lake and immediate vicinity.

380623-173


CAMP
PRIVATE LAKE
DEAD WILLOW TREE
FIR
SURVIVOR SP.
LONE SPRUCE SP.
STRANDED LAKE
BRINK MEADOW
ASPEN
ASPEN

During the 380623-174 2:00 P.M - to 4:00 P.M while setting trap-line
it hailed at 3:00 time from and had that it sprung practically all traps
that had been set: so necessated resetting and baiting. This
hailstorm lasted 12 minutes and covered the ground with a
layer of white balls that took on the appearance of a dirty
white snow field. By 4:00 it had disappeared from the
more exposed situations. Immediately after the hail
storm the Thrushes commenced their singing. Rained at
3:40 for just a few minutes. While at Stranded Lake found
Lincoln Sparrow quite concerned and likely had nest in
grasses. Hailed at 1:40 and stopped at 1:52 which has same
hail period of 12 minutes as storm at 3:00 P.M. On return-
ing from trap route located nest of Lincoln Sparrow 300'
from source of Survivor Spring and on edge of stream on
island of stunted dry fir 1' high. nest placed under complete
protection of grasses. Base at base of grass patch with top of
nest flush with top of hillock. Contained 4 fresh eggs. When
stepping on the edge of grass clump it flew 20' into fir & watched
my procedure and called frequently.

5:10 after the thunder and hail storms had subsided a little
eleven clarks Crows were seen working back into Invasion
Canyon among the Spruce where thunder & lightning had been
raging furiously. Blue now shown through clouds while
to the south the sky was completely clear with beautiful
white clouds. In tracing the weather from beginning of trip
this morning to now at 5:10 P.M one finds the stages represented
in this manner. At 11:00 P.M large white clouds like the
Cumulus type pushed leisurely to the east into a clear blue sky
without a cloud represented. Soon the Cumulus clouds changed
into dark black thunderclouds. Their movements at the east end
of the Aquarius had neither constancy nor regularity. The
lower strata were antagonistic with the east trending course of the
upper strata. This mixing of lower & high clouds continued until
about 1:00 when the thunder crashed and from the overcast
skies came hail followed by rain which lasted for 12 minutes.
Very peculiar but very little wind accompanied this storm
at least at the glacial platform level. The period of intermittent
hail & rain continued for 3 hrs & then subsided at 4:00.
The thunder at times was almost instantaneous with the
bright flash of lightning. Hail pellets came with such force
that all traps set in exposed positions were sprung which
necessitated resetting. The most interesting thing about this
storm is the fact that it concentrated itself over the
Aquarius plateau proper & particularly at the east end.
While the storm was at its heighth the sky to the south
was blue and devoid of storm clouds. The areas of Kane County
were still enjoying the desert sun shine and warmth.

380623-175

Began taking record of Pseudacris → calls in Private Lake
100 south of camp. At time I wondered from camp but at all times was in hearing distance of lake. She frogs began at 5:25 P.M. and called for 2 minutes 10 seconds then stopped.
Pseudacris started croaking at 5:34 for 2 minutes 20 seconds
Temperature then = 52° F.
When I approached Private lake they stopped when 20 feet from edge of water where they were singing. After a short while one frog started calling for 6 second but more rapidly than normal. Have seen several Juncos some feeding among the damp ground around the boulder at lake, some carrying insects in mouth, some feeding singly while others fed in pairs.
5:46 Pseudacris began calling at 6:46 P.M. and lasted for 50 seconds. Would say that 3 or 4 were calling. Wind blowing
5:47 Pseudacris began calling and lasted 30 sec. Wind blowing slightly but gentle. Started up 30 secs. later and continued for 10 secs. Little sunshine now and then for first time at 6:00 P.M. Seen two Euplamias since arrival at 1:00. Male and female Mt. Bluebird have nest in aspen tree at Station and have been continuously feeding young. The male fed young, then flew down to Private Lake and returned in 30 seconds.
Pseudacris calling at 5:55 for ~30 seconds.
Juncos flew by 5:57. and ♀ bluebird feeding young.
Pseudacris calling at 5:59 for 1 minute. The calls now are not as vigorous as throughout last half hour. Started after 20 seconds for 18 seconds.
Pseudacris calling at 6:03 for 2 minutes 10 seconds. The nesting ♂ bluebird flew within 2 feet of my head while standing on shore of lake.
One Pseudacris called 5 times at 6:07.
Pseudacris called at 6:08 for 1 min. 50 seconds.
6:09 Shrikes flew by.
6:14. Pseudacris called for 2 minutes 5 seconds.
Robin chirped vigorously with worms in mouth.
6:15. While setting near lake a male and female Audubon Warbler began fighting in spruce tree on lee sides of Survivor Spring. After a few rounds they flew to open field between Spring and Private lake and continued their scrapping among the Andesite lava boulders.
The ♂ was the aggressor but the ♀ resented in combat. Fighting on top of the boulders they would contact and tumble down to the ground over the rough edges. Occasionally they would fight like roosters with necks outstretched and bodies erect. After about 30 seconds the ♂ left and the female flew in opposite direction and let on limb of old willow tree at east edge of Private lake where it proceeded to shake + ruffle up her feathers.

6:20 P.M. → 380623-176 Skies blue → overhead with few clouds. Pine Siskem flying south alone and calling.
Pseudacris calling at 6:33 for 10 minutes in continuous stretch, frequently one or two would carry croaking along during the low stages of the croaking. Wind gently shaking rain drops from tops of aspen trees.
Pseudacris calling at 6:45 for 2 minutes.
6:45 Sun shining on east side of Private lake only the remain. surface in shadows of aspen and west hillside. The manner in which the Pseudacris would call would be constant but frequently would vary. To begin with one frog starts calling and in about 1 second after the rest would follow unanimously. One can tell when they are going to stop by the manner they begin their closing call. First one will stop, then another until all have ceased their song. At 6:15 while walking along south side of Private lake. ran into a ♀ and. Harbler She presented before me one of the most interesting examples of bird feigning. I first saw her when she began her activity 50' away among the aspens. Her most characteristic pose while on ground in movement was her continuously delicate beating wings and outspread tail held in such a manner as to appear as if she was riding or sliding upon it. The gracefulness of her antics were impressive indeed. When on tree would drop to lower limb or even to ground as if shot or attempting to regain her equilibrium. When on the top of a boulder would drop over edge in rolling manner as if affected by a severe injury or accident wound. This exhibition proved to me at once that possibly a bird has a small degree of intelligence at least enough to preform an act that it has probably never suffered before. such as a broken wing act. The wing beat did not necessarily indicate a broken wing condition but occasionally it would throw over as if it had been shot into a mass of falling feathers. The ♂ came upon the scene just a few seconds after ♀ began feigning act. He had worms in his mouth and held them their during the entire time he gave his warning chip. The long evening shadows were then creeping across the lake & hillside where Warblers were found.
6:53 One Pseudacris called (croaked) 7 times before others started in to calling. They called for 1 minute. Started again after 10 seconds 3 minuts and 8 seconds. Last shadow 20' south of lake gone.
Left 7:00 P.M to reset traps sprung by hail storms. for final time. 7:00 P.M. ♂ & ♀ bluebirds still feeding one ones. Frequently the one parent would wait at hole edge while the other fed the young the after leaving would slip right up & deposit her worms & insects. Found that the above shadows are influenced by low clouds in the west and do not represent normal disappearance of sun from

the lake.
7:06 Two Clark Crows flew by. Revisited Lincoln Sparrow nest at edge of Survivor Spring creek. Placed float on clump of grass, 11½ feet from nest, before it left. At a point where creek enters the meadow at Strand Lake recorded directions where A.W. Thrush songs were coming from. (7:15) Station at a point 400' west of Stranded lake & 100' east of the lone Spruce at head of Lone Spruce spring. Can hear one west of spring in aspens over hill, one east of Stranded lake in aspens, one north of rock laden gulch above spring; one directly south between this meadow and Brink Meadow. After inspecting traps return to Station 4. No record of frogs call during the time I was rewinding trap line.
7:40. Eighty feet south of Private lake on top of knoll the sun rays were just leaving the tops of the spruce trees. Temperature then 49° F. On the south-east drainage of this same hill and 100' south of boulder lake the Curly grass constitutes 75% of the vegetative covering in a matted pattern. This slope drains into Stranded Lake Meadows.

Pseudacris calling 7:45 for 2 minutes 10 seconds. No wind.
" " 8:00 " 2 minutes.
" " 8:15 " " "
" " 8:18 for 12 minutes, continuously.
" " 8:33 " 10 minutes.

Retired at 8:40 P.M with slight rain for about 40 seconds. Temperature then 48° F. Skies manly clear but a few clouds on western horizon. Before falling asleep at 9:00 the frogs were still going in stretches of about 10 minutes duration, stopping for about a minute before starting again on their 10 minute stretches. This afternoon I established an Indian camp site on top of knoll 600' N. 45° W of Private Lake from an area of about 30 square feet and coming from a definite dispersal point, picked up an awl and several pieces of arrow points. Other flint fragments were strewn upon the surface. Just accidently discovered this area when I walked out to this point to watch the changing moods of the desert country far to the south as the sun sank down beyond the western horizon.

* Station 4 — 6/24/38 Private Lake
First sun rays on top of aspen trees on hill top directly south of Private Lake at 5:32 A.M. By 5:45 A.M the sun had crept down to bases of the aspen on crest of hill. Robins singing at break of day but no Pseudacris singing or calling as yet. Thrushes started at 6:10 A.M. Temperature 46° F.
Trap line. Museum Special Group placed along edge of creek from Head of Survivor spring, down to a point 300' below along course. Aspen grove discernible 100' to the east and bordering at head of spring. Grassy hillsides west & South. The ground is wet, or at least damp six feet either side of stream.

380624-178.

1. Unaffected. Edge of water. (Starting from head of spring.)
2. " " " "
3. " Under protection of spruce. 3 feet from water edge.
4. " In grasses at stream edge.
5. " " " " "
6. (777 J.B) Micratis mordax mordax. Along side of water in muddy surface with grasses growing in it. Near spruce trees.
7. Unaffected. Under protection of large spruce where no vegetation grows. Six feet from water edge.
8. Unaffected Marshy grasses in standing water at convergence of lower side spring.
9. Unaffected. Along wet creek side where grasses almost choke creek.
10. Unaffected. Base of spruce three feet from water. Dead spruce needles, grasses & mosses cover the surface.
11. Unaffected Side of lava boulder along creek edge.
12. Unaffected. In center of small spruce growth three feet from water edge.
13. Unaffected. Edge of spruce and large boulder six feet from H.O.
14. " Base of spruce in stunted growth.
15. " Among dead willow & spruce 18' from head of spring.
16. Spring. Along side of dead aspen log lying across boggy area adjoining head of spring.
17. Unaffected. Bordering spring along side of boulder.
18. Spring- but remaining. Among boulders a few feet from head of spring by aspen tree. A cow trail crossed at this point between two boulder and required the small animal to almost step into trap. Started the above set of traps at head of spring and set down to lateral spring on west side of water course, then back again to head of spring on east side. Beyond the six foot zone of damp stream edge is a 10'-30' zone of short green grass type of vegetation. Beyond this zone toward the aspen covered hillside to the east is the taller bunch and curly grass association which invades aspen growths.
19. Unaffected. Under protection of spruce 4 feet from edge of water.
20. " " " " " " " " "
22 " Under protection of spruce tree 4' from creek.
23 " Under ledge of large igneous boulder at base of spruce tree.
24. Unaffected. Under stunted growth of spruce with wet green grasses surrounding. 10' from edge of water.
25. Unaffected. On mud among grasses at edge of stream at convergence of two springs. Traps from 19-25 along either side of creek from convergence of two springs down to the 300' mark below head of Survivor Spring slope.

D group of traps. Confined to west side of Lone Spruce Marsh and meadow from head of spring to where water leaves meadow and starts down main stream to Brink meadow.

26. (775 J.B) At base of the dead Spruce tree at head of spring and 10" from from where water issues from the base of the large boulder slide.

25. Unaffected. In wet meadow grass 8" to 4" high. Hillocks and springs around with wild bushes near

24. Unaffected. In wet meadow at base of dead willow mound.

17. Unaffected. Base of willow Clump in meadow.

16. (781 J.B). Audubon Hermit Thrush. Among currents and dead willow in boggy area. caught in trap,

15. Unaffected. Dead willow clump.

14. " Edge of standing water & long grasses.

13 " " " " " " "

12. " Base of willow at edge of standing water.

9. " a willow clump. Trap set in Microtes runway in springy area.

7. Unaffected. Shot dead willow clump in swampy area.

6. (778 J.B) Microtis. at entrance to hole on isolated clump of willows in wet meadows and swamp.

6. Unaffected. Another isolated willow clump. 10' from no. 6.

4. " Isolated willow clump in swamp. Masses covered base.

3. Unaffected. Between stunted spruce and willow patch in damp but not wet area. Gopher diggings near. Water 20' away.

2. (779 J.B) Microtis. mordax mordax. At south end of meadow where water from both Lone Spruce Spring and Stranded lake converge and flow in one stream. at base of willow clump on grassy area but well drained. 10' from edge of creek

1. Unaffected. Edge of above creek on mud and wet inch grasses.

G. Group of traps. These traps were set along east side of Lone Spruce Marsh.

1. Unaffected. At mouth of hole on moss covered mound of stumped willow surrounded by springwaters. Ground a rich black color

3. Unaffected. Skid.

4. " Skid

8. " "

9 " "

10. Unaffected. On one foot high mound of dead willow roots covered with mosses + grasses + surround by standing water & grasses

" Unaffected. Skid.

12. " Mound of dead willow stumps + one spruce surrounded by water + grasses.

E. Group of traps These traps are placed from Convergence of L. Sp. Spring and St. Lake up Stranded Lake Drainage to lake proper.

1. Spring. Base of willow grasp by standing water and grasses.

2. Unaffected. Skid. Three feet away from 1.

3. 380624-180 Base of willow clump.
Unaffected
4. " " " "
5. Unaffected. Elevated willow clump of dry limbs & sticks.
6 " " " " " " " " "
9. " In willow clump 7' high in meadow lands.
10 " " " " " " " "
7. " Willow patch with runningwater and grass on all sides.
8 " Ibid.
11. " Base of willow in center of meadow.
12 " Ibid
15. " Edge of Stranded lake. Stranded lake is clear but chacked with 2½' grasses growing on the water. Boulders surround the edges with damp black soil among them. Twelve foot willows dry and green surround the edge with aspens & fers crowding close to the edge. measures about 100'x180'.
18. Spring. Under spruce 5' from water. Thick fond growth. Chipmunk seen near.
19. Grassy area back of boulder. Unaffected.
21. Unaffected. Grassy area at edge among boulders.
24 (776 J.B) Plesmpacus. Head of lake under fir 10' from water among boulders.
23. Unaffected - Under fir tree 20' from water.
25. " " " " "

There appears to be no frogs in these meadows as D. did not see or hear them at any time. A callaspermophilus fed in dry spur on north end of meadow. not wet but in damp grasses area surrounded by meadowlands. Thrushes still singing here. Left for Station 4 and on arrival packed mammals and waited for George and Wilmer to come. They had left Station 3 this morning and were to relieve me until tomorrow morning. George rode to run trap line this evening. They arrived at 8:20 A.M. Temperature then 57° F. Left for Station 3 at Steep Creek at 8:40 and collected a Marmota (780 J.B) in rock slide 270' north of Private Lake. It was heavily infested with flees and collected many from its fir and preserved in alcohol. This rock slide is similar to the one found below Steep Creek Lake however it has a steeper slope than the one below but similarly surrounded by aspen trees. The boulders are larger than the ones below. It appears to me that two types of boulder accumulations are represented here, one a moramic deposit. and the other a rock flow which seems to have been superimposed upon the glacial deposit. Collected the set of Lincoln Sparrow eggs and hit the trail for Steep Creek camp. On way down made a few selective recordings. Followed more direct route to camp.

8:54 Audubon Warbler feeding in meadow below Coat lake. Arrived at Coat lake and heard a few frogs croaking in lake. Three bluebirds so far. Juno singing. Eutamias seen. Several Nutcrackers feeding in aspen trees just above St. C. Camp. One sounded like a frog. Six Crossbills (?) flew by. Arrived at

Station 3 at Steep Creek Camp at 9:15 P.M 38.0624-181
(782 J.B) Set up equipment.
and started to work. The Lincoln Sparrow nest found this
morning at Survivor Springs was made of dried grass stems
lined with small yellow stems and horse hair. Eggs fresh
Broke set and destroyed.

(774 J.B) Callospermophilus lateralis lateralis. Observed this mammal to run into hole on opening between Private Lake and Survivor Springs at about 4:0 clock yesterday afternoon, as placed trap in hole and did not catch until the morning after.

10:45 Heard raven calling. The skies were clear this morning but clouding up with slight wind around noon.

(779 J.B) Microtus m. mordax. Uterus normal.

(778. J.B) Microtus. Bladder measured 16. m.m and contained a white albumen like matter in suspension occupying the lower 1/5 of sac. Testis measured 12. m.m.

(777 J.B) Microtus m. mordax. Bladder distended with white albumen collected at bottom in suspension. Testis 12. m.m.

(776 J.B) Embryos 3.5 m.m. Six in number.

(775 J.B) Peromyscus. Skull only.

Length	149 m.m
Tail	61 m.m.
Foot	20 m.m.
gr wt.	16

Toward evening went to government point to watch evening shadows cross the desert country below. Wilmer Tanner returned from top of Aquarius where he had spent the day with George who was remaining above at Station 4 tonite. He reports 2 deer without horns at West Dee Lake.

One large porcupine, Spotted sandpiper, Am. Coot, Rail (?) and 12 mallards all at West Dee Lakes.

6:00 P.M. Checked on Lincoln Sparrow nest 100' N. E of cabin that I had under observation. It held 4 young now with their heads erect & mouths gaping. Windy tonite but skies clear. Bats flying before wind started. Temperature at 9:30 P.M = 52° F. Still windy. Up to date no more re-occurrences of the night flying butterflies.

X Station 3-4 - 6/25/38 Steep Creek & Private Lake.

Sun up at 5:55 A.M. Robins and House Wren singing at daybreak. Left at 7:00 for Private Lake to relieve George. and made complete circles on way up.

7:02 A.M. Vireo singing among aspen along creek. Am following up hillside Creek, from St. C. Jct. toward upper plateform. The stream follows up through aspen trees and is more boggy and swampy like than I supposed. House wren singing and hummer passed by calling.

7:05 The last part of House wren's song similar to Spurred Towhee song.

7:10 Small pond filled with geese.
7:11 Vires singing.
7:15 Above pond on chokecherry hillside watched Macgillivrays warbler feeding and singing. It has 3 high notes and 2 lower nate as it sang. Thrush singing.
7:19. Few swallowtail butterflies.
7:21 On gaining the upper edge of glacial platform came upon two Caelostpermophilus on wet meadow. They were evidently together but each ran in opposite directions to boulder piles 500' apart.
7:21. Vires singing. Siskin flew by.
7:24 Robin flew up and over meadow. two others at edge of aspen.
7:25 Juncos. Vires and chipping sparrow calling.
7:26. Thrush singing
7:30 Juncos. Vireo & Robin singing.
7:33 Arrived at Coot Lake at first outlet east of the long meadow to the south. Caused here Chipping Sparrow, Vireo, Wood Pewee, thrush and robin from lake. a ♂ & 2 ♀ mallards left lake. From Calling After leaving the south west end of lake on trail to camp ran into a abnormal number of damsel flies 2" long. This congregation of greenish damsel flies flying covered an area about 200' x 100' among the aspen trees near the surface of the ground.
7:38. White tailed jack Rabbit ran down toward Stranded Lake from among the aspen trees. Arrived at Station 4 at 7:45 and heard the chipping Sparrow, siskens, and audubon warbler. Met George ready to return to St. A. Station. He stepped over to rock slide north of camp to collect a Pika that was heard here two days ago. Their call is a very low nasal grunt ~~eee~~ and different from the call of the pika found on mt. Tenpanogos. This pika was collected at 8:00 A.M when half the slide was in the shade of the east bordering aspen trees. It was on sunny side of slide but heard another on shaded section. The mosquitoes on the slide are very annoying but bearable. They ceased their activity two nights ago when staying here at about 8:30 P.M and did not bother me when sleeping. Swallowtail butterfly flew down slide. Among the rocks there white lime looking deposits upon the sides of the boulders in limited spaces. After bidding George goodby and good luck on his return trip prepared to spend the day collecting. Planned on visiting west Deer lakes and all intervening rock field with the objective of collecting the pika and Sciurus, both appearing to be very scarce at this particular side of the aquantius. Was beginning to wonder if this (Pika) occurred here for trips to Roger Peaks and Donkey Reservoir of two years and a year ago failed to disclose their presence. So with main objective in mind left Station 4 at 8:30 A.M to work the lower end of Invasion Canyon and West Deer lakes with all country between. Directed course around Indian Point to the rock flow area at Invasion Canyon.

10:00 at Slide area about two blocks west of Indian Point. Here the flow area takes on a unique setting. It is a linear area of about 3 blocks long and 300' wide. The general trend is lineal but several laterals branch off to the sides. Their texture and rock constituents are similar to the ones found at Private Lake and Steep R. Lake area. but on a much larger scale and the entire length uninterupted. It is very likely that terminal moraines and later rock flows are represented here however possible that the entire area is caused by glaciers alone. While working down the east side of the main flow came to a lateral branching off ~~which for 150'~~ turned to the east, then south paralleling the main flow. The first pika was seen at the head of this lateral. approached within 20' before noticing it and while backing up for a more desirable shooting range it disappeared. The second pika was first seen 15' away and remained very still. This pika as well as the above were feeding on the peripherial edge of the slide. This slide is from 10' to 40' wide and run south ~~into~~ to open field 700' S.W. of Indian Point. Spruce, fir and aspen of equal numbers bordered at the entire length. Collected the second Pika (786 J.B). The third pika was seen and collected (783 J.B) 300' down the lateral slide of above. Was sitting on top of boulder in the shade among the aspens 20' from main flow. These rocks were more or less connected however with main linear series but on the extreme peripherial edge. It offered no sound and first discovered at 40' away. The mosquitoes so bad I cannot write and even find it difficult to label specimens. Slight breeze and clouds coming on. The three pika are all on same lateral slide, the third one 280' from the first two but lower down slide. The third one at the terminal before entering field. After collecting on this slide returned to where it joined main slide (10:50) and from here went south to its terminal and then worked back and forth up its course. At one of the west laterals heard fourth pika calling. It gave a low grunt like a mechanical blat. This moraine like deposit was more or less isolated. Heard juncos scolding and recorded Mt. Chickadee. Crossbills flew by (?) and one pine siskin in air.

11:00 at same slide as above collected a (787 J.B) Eutamias Left at 15' and ran 120' up peripherial edge of slide without stopping. This terminal moraine forms a barrier with depression on back of it mountainward. Among its rocks heard a noise that sounded like an alarm clock ticking.

From the lower limits of the slide area worked up toward Invasion Canyon systematically covering the main trunk of flaw area and all its laterals. Was more than hoping that I would not find any pika among the rocks of the main trunk and at these higher slide areas because I had already made a deduction that the pika were found at the terminals of the lower slide areas and among the boulders of the small laterals. By the time I had thoroughly covered the main upper course found the deduction holding true because I did not see or hear a single pika during the time I had left the lower terminal areas. It appears then that rather than preferring the rocks of the extensive trunk flow, they inhabit the isolated and narrower laterals and mainly those found at the lower ends where slides end abruptly at the edge of the more open & flat aspen covered plateaus below. From the head of the slide area worked west into canyon leading down into the east end of West Deer Lake. Since leaving Private Lake this morning have been almost continuously stepping or jumping from one boulder to another among these mordnic accumulations and quite surprising to find only four pika up to now.

12:15 Arrived at east end of W. Deer Lake. About 200' before reaching lake found hundred of damsel flies flying just above the ground. One frog was calling. Planned on circumnavigating the lake. starting from east end and walking along north side of lake.

1:00 P.M. Beaver house on north shore of lake about in the center of lake. Made of aspen logs and covered with a light green moss. The aspen trees bordering the north edge of lake have been cut by these beaver and as one leaves the east end of lake and approaches the house, the trees that have been cut become more numerous in numbers. The same as true in approaching from the west to house. Most of the trees that are cut down have been only a few feet from the edge of the lake shore. The average number of feet that would represent highest trees cut on hillside would be about 8 feet. Occasionally a tree would be cut beyond this limit of ~~eight feet~~. The damsel flies on lake shore were found in abnormal numbers, 20 in one ~~square~~ cubic yard in air. On the north and east side of the rocks and logs were the cast skins always arranged with head pointing upward. Counted 50 skins in 3 square inches. Noticed also that when the live mature ones light upon the rocks, they took same position as cast skins. From the evidence of the lichens upon the rocks at the water edge would say that the lake rises frequently at least 2½ higher that its present level. A distinct high water mark is recorded upon these rocks.

Ten mallards fed on lake flying from one end to the other but keeping to south side of lake. They kept mainly in the grasses growing on both the east & west ends of lake. another deep diving duck flew across lake but could not determine as to species. Robins singing.

1:10 Collected garter snake on north side of lake. It was lying outstretched with head facing hillside and entire body except tail on bank. The lakes edge stops abruptly and shore continues as rocky & grassy hillside covered with aspen trees. The bank drops abruptly and lake edge of a 3 foot width of water grasses. 10' from bank, lakeward, the water is 5' deep. Cloudy and breeze. Damsel flies numerous here.. associated with the beaver house is an area on lake edge where they have regurgitated masses of crayfish.

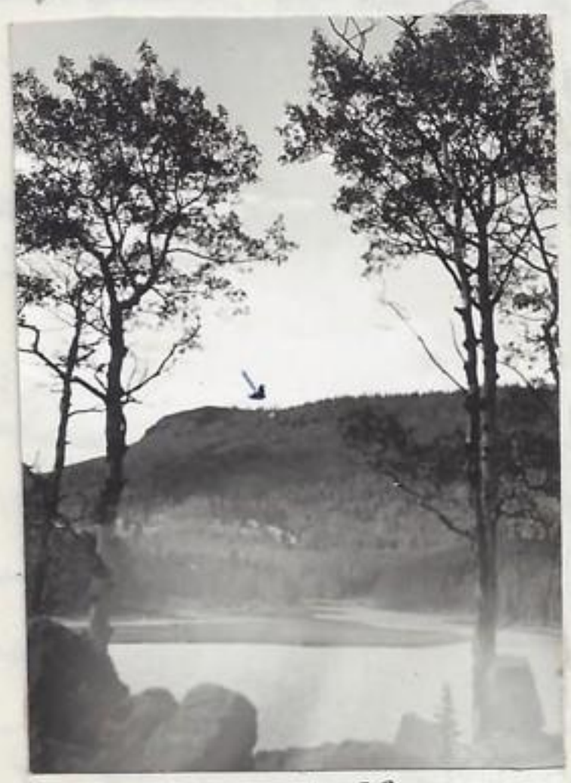
1:16 Collected second garter snake 100' from first one under almost identical conditions. It was curled however on dry leaves and aspen drift wood at base of rock slide jetting into lake. Some large green submerged plant growth 10' from shoreline under 3' of water. While setting on lake shore watched a ♀ mallard and ♀ scaup duck 200' and 300' respectively away. The mallard was swimming along shore line to the west when she first became cursious as to my presence and commenced swimming straight toward me. 100' - 90', 80' 70' 50' then at 40' turned south into lake for 10 feet then began cautiously removing gating. meantime the Scaup became concerned & came to inspect but only come 180' and then done. Made several motions with hands but were not concerned. but when I rose they both flew 100' lakeward and stopped. Third snake (4 foot from shore. but escaped before I cound collect. It dove into lake and swam 3' under water to remain among the submerge plants (Potamogetons). It was replaced over floating rushes and grasses 1' from shore, and 100' from last snake seen. Beaver cut aspen 30' up hillside from lake shore line and 1 foot in diameter. Fourth garter snake of about same age as collected on shore on lagoon on north side of lake. Swam under water to grass growth and remained. The habitat favored by these snakes was not as typical as found at other sections of the lake and presented quite a problem as to why they were found here and at no other part of the lake. One hundred feet west of lagoon springs begin to issue from the sloping ground along lake shore. Two Chipping Sparrows fed among grasses in spring.

1:35. A ♂ mallard feigned on west end bay before I flushed the seven young which were on shore line among the willows.

While the ♀ fussed back and forthem bay the young swam through bordering grasses to opening and then almost ran across water to opposite side of water grasses. Am. Coot calling. The west bay is being invaded by grasses from the edges, but open channel still remaining from springs to main part of lake. at N.W. end of lake grasses on land bordering lake bent down and matted with crayfish Hegurititions about. Spotted Sandpiper calling.

2:00. At point where good volume of water enters lake from springs above. From here went (back south to small lake. It had Pseudacris in it. While walking along lake edge to most southern side heard Wood Pewee, Vireo, Redwinged Blackbird and Spotted Sandpiper called frequently as it kept in head of me along shore line.

2:12. Most southern end where one would expect to find the outlet but not very well defined. From here continued to the east along shore line to rock slide protruding into lake from hillside. (2:15).



1-6-24-38

16 x 1/2.5

From this slide photographically recorded the vegetative encroachment into lake at its western end and also indicating the channel kept open by the spring water issuing from the extreme west end of lake. Snowy patch 60' below distant rim of lava cap. Unfortunately the picture was light struck and inserted here for record only. From this point I watched a ♂ and ♀ deer feeding among the fir and aspen 100' to the east. The ♂ had horns and in velvet. Both had been feeding or drinking in lake below for they had mud splashed against their heads & body. The mosquatoes were annoying to them and kept their tails, ears, feet and head in constant motion. They continued to feed until ♀ sensed danger and left on the run. Bewildered the ♂ followed. Left rock slide at 3:00 P.M. and returned to lake edge to continue. Ten Juncos fed in one flock near shore. The ralins sang frequently and up to now have seen 18 on trip around lake. Swallow flew over water but could not tell as to species for positive record. One Utah Jays fed in firs & aspen. A Phalarope (?) was seen on its characteristic flight along edge of lake in the distance. Nearing the east end of lake 8 mallards flew up from among encroaching the water grasses and flew west to other end of lake. The two deer seen at slide were just leaving east end



of lake and entered aspens. Numerous gopher digging among the dandelion covered shore line. For 20' along shore line and 200' from east end the grasses were matted down and showed signs of being used very frequently. Several regurgitated piles of crayfish were found associated with this area on the trampled grass. One aspen tree cut on south side of lake. Arrived at east end of lake at 3:15. The water grasses have invaded lake for 120 from shore line. Two Juncos feeding here. From this point left lake and went south into aspen and fir covered hillside over hill to where I met trail that lead to the east. Followed back toward camp along this trail. 3:40 Investigated large boulder patch to right of trail. When I approached at edge a large owl (?) flew from tree on peripheral edge of slide. Heard pika 70' from where owl was sitting in tree. This area is isolated and appears to have no connection with main slide areas of Invasion Canyon. As the pika disappeared into rock slide its call decreased in volume as probably penetrated rocks for some distance. This call was the first one that sounded normal like the calls I had been used to hearing in Utah County and was the second one heard since the one headed at camp in flaw north of Station 4. Waited 15 minutes and fought mosquitoes until the Pika returned and then collected (786 J.B). When I rubbed my finger over back of this animal 15 fleas appeared at one time. Left here and continued east down this canyon to Disappointment Lake at 4:20. This lake or ponds and associated marsh is at upper edge of flat platform. From the rocks at the N. E end one can view south across a broad but slightly irregular opening. Three prominent terminal moraines can be seen on distant edge of plateform. This lake is given the name Disappointment lake because one would expect to find a large body of water here because it is geographically and ideally situated at the bottom of the entire Invasion Canyon directly to the north. That is the particular set-up; Survival springs continued after being severed from its mother source by the pirate Invasion Canyon while Disappointment lake while structurally situated is failed and receives practically no water from the source the at one time rightly belonged to Survivor springs and associated bodies of water. Among rocks just north of lake collected a (790 J.B) Callospermophilus lateralis lateralis. When shot another one peered over rocks 20' away. Collected the other (791 J.B) one at entrance to hole. At one time while running across ground held tail over back like the antelope chipmunk.

3 80625-188

(788 J.B) Eutamias adsitus. Associated with Callospermophilus of above.

(789 J.B) Eutamias adsitus. Ibid.

A marmot had hole 200' away on east side of lake. Several frogs (Pseudacris) calling on lake. It is interesting in that during the entire trip today I ded not see any Callos, and marmot only one Eutamias but as soon as the glacier platform was approached where the forests of Spruce, fir and aspen with associated rock flows. are replaced with more typical aspen forest and broad open clearings the mammals became more in evidence. Leaving this lake I planned on retracking the same rock flows as followed this morning to check on the pika again to see if the time of day had anything to do with their lower distribution. Started up from the lower end of the lateral where I had collected two Pika this morning and at 4:50 and 100' from no. 783 J.B on opposite side of flow and on peripherial edge. Was setting on top of rock in shadow of cloud and with hands was eating two aspen leaves. The elderberry, spruce, aspen and sweet peas were within 20' of pika. It did not call. It was heavily infested with fleas and counted 20 at one time. across the flow an opposite site saw the first and only Sciurus seen on entire stay at Station 4. Seemed rather peculiar that with the number of hours I had spent in the field and the favorable Sciurus places I had encountered, ded not see another one. Found several spruce cone scale patches among spruce but ded not find the Sciurus associated with them. I have wondered whether the bark-beetle devestation of the Spruce trees have effected their numbers. This Sciurus & pika were 200' from the open clearings of the upper edge of the glacial plateform and near terminal of rock flow. From here crossed the same areas as crossed this morning but did not see another pika. At the head of the main slide coming down from Invasion Canyon left and started up east hillside to top of ridge. When near top of ridge at 5:20 heard Kinglet and watched the Chickadees feeding among the spruce and fir. After going top of ridge followed north until intercepted Government trail which lead down into the bottom of Invasion Canyon. From the highest point on this trail leading down into Invasion Canyon to the N.W and into Station 4 country to the S.E, I walked for 13 minutes at a steady gate along the government trail up the Invasion Canyon. At 6:00 turned around and followed back trail to divide leading directly down into Private lake, Arrived at divide at 6:13. During this trip up Invasion Canyon kept eyes open for the

Seiurus and even with the many Spruce, firs and aspen, which looked to me like an ideal habitat for them, found none. At a point where trail leaves bottom of Invasion Canyon and climbs up hill to the east saw several active gopher holes in opening on Canyon floor proper. Then divide dropped down to camp via of the boulder flow just north of the Private lake. and while crossing over the boulders heard the normal call again of the pika. It called once and then disappeared, and did not return after a 20 minute wait, at least, I did not see it again. Arrived at Station 4 at 6:18 being in the field today for 12 hours and 18 minutes. Left without eating supper now and with weary worn feet from clambering over rough boulders all days left for trapping grounds at Coot Lake.

Coot Lake is east of Private lake and lies on a more flat area than Private lake. Set traps on the north side of the lake from the most western end to the east end. Traps every 20' apart the entire distance. The north side of this lake is lined with willows. The water edge is definite with grasses and black soil beyond. The most eastern end however has allowed the lake water to encroach beyond the willow trees. The bordering shore line supports many smaller boulders among which is found damp soil covered with dead aspen leaves and occaisionally has standing water. Aspen trees envade to shore line in several points. Several laterals run from lake into shore line. All traps were set in such a manner as to effect micratis. Thirty Eight traps were set along this course. Returned to Camp at ~~sundown~~ and found note left by Wilmer who had been on to of mt. and just returning to St. Creek Camp. Temperature at 8:20 = 56° F. For the last hour has been thundering to the south and west. No. Wind. With few mosquitoes retired.

* Station 4. 6/26/38. Private Lake and Steep Creek Camps. Up at 5:05 A.M with Temperature 49° F. Junco, thrush and robins were singing at this time. Last night started to bed with two sleeping bags, pants and sweater but before long took 4 lb bag out of 8 pound bag, shed sweater and took off pants. and still slept plenty warm. No wind and decidedly quiet last night while this morning skies rainy looking and almosphere oppressing. 3 Juncos singing 350 apart. After breakfast left for Coot lake to pull traps. On arrival at lake at 5:20. Two mallards left lake, one from west end and one at the north side. Also a two mud hens were on water. Chipping sparrows singing.

Trap line results.

1. Unaffected. Lake shore contact.
2. " " "
3. " " "
4. " "

3806 26-190

5. Sprung. Lake shoreline contact.
6. Unaffected Ibid.
7 " "
8 " "
9 " "
10 " "
11 " "
12 Peromyscus. Base of willow tree on lake edge (792 J.B)
13 Unaffected. Ibid.
14 " "
15 " "
16 " "
17 " "
18 " "
19 Peromyscus. Shoreline Contact. (793 J.B)
20 Unaffected. Ibid
21 " "
22 " "
23 " "
24 " "
25 " "
26 " "
27 Peromyscus. Edge of boulder near water. (794 J.B)
28 Unaffected. Shore line contact.
29 " "
30 " "
31 " "
32 " "
33 " "
34 " "
35 Peromyscus. Base of aspen at shore line edge. (795 J.B)
36 Unaffected Ibid.
37 " Shore Contact.
38. " "

Out of the 38 traps of above caught only 4 peromyscus and all other traps unaffected except one which was sprung. Felt that the north half of this lake was well under control and if there were microtus there can not see how they could have evaded the series of traps set especially for them. On the south side of the lake the sedge & short grasses are more extensive and possibly will be found there. Tall water grasses occupy a greater portion of the lake surface proper.

Back to camp at 5:50 A.M and by 6:25 had camp razed and ready to leave pending the arrival of Beck and Tanner. Stepped over to rock flow north of camp at 5:55 but Pika not mendence. While waiting for party went to Disappointment Lake and lower lateral of Invasion Canyon rock flows to check on Pika again, but did not find them active. At Disappointment Lake saw 4 large buck, [redacted] with horns in velvet. Two were three pointers and two, two pointers. All four had exceptionally wide spreads. I watch them at 200 for several minutes before they finally left. Met them again on returning to camp. Leaving camp and scarred an aspen tree with three nicks where camp

had been for last few days. These markers are 65 rfrom north end of lake. About half way to camp examined Gray headed Junco nest that Dr. Beck and Hilmer had found on their trip to camp this morning. (796 J.B) Nest and 5 eggs 50' from edge of aspens in aspen grove Placed on sloping sidehill at edge of aspen base. The forest floor was covered entirely with dry aspen leaves. The surface was dry and large mud like cracks of 1 foot sections controlled the pasture systems. A few bunch grasses ~~clotted~~ the surface with one at base of aspen tree where nest was located. It was wedged between trunk and this mound of grass.



The outer rim was of aspen inner bark. Cup of round yellow stems about 2 m.m thick. Horse hair lined bottom and cup edge but very sparingly. Contained five eggs. Bird left the nest by running afir ground and not using wings. Reminded me for a second of the actions of a Snowy Plover. Did not call until it flew up into aspen tree. Both birds were seen this morning but only one at this visit. On arrival at Sleep Creek Camp started immediately on preparation.

(784 J.B) Pellets nearly spherical measuring 4. m.m.

(787 J.B) Embryos 4 in number. 25 m.m in curled sack.

(788 J.B) Embryos just developing.

(790 J.B) Testis 8 m.m

(791 J.B) " 8.5 m.m

(793 J.B) Skull only.

Length 165 m.m.
Tail 71 m.m. ♀
Foot 19 m.m.
wt gr. 26

5 embryos 5 m.m in curled position

(794 J.B) Skull only.

Length 142 m.m. ♀
Tail 63 m.m.
Foot 19 m.m.
gr.wt 14

Uterus normal.

(795 J.B) Skull only.

Length 154 m.m. ♂
Tail 61 m.m.
Foot 18.5 m.m
gr.wt. 20

Testis 10 m.m.

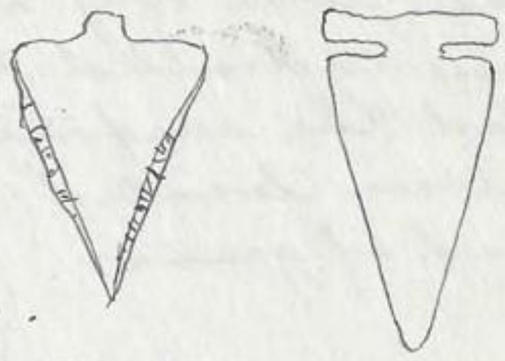
(792 J.B) Six embryos 5 m.m long in curled position.

(797 J.B) Hilmer collected a Stromyeus under log at South ~~Ends~~ of Mona Lake.

Length 144 m.m.
Tail 63 m.m. ♀
Foot 19 m.m.
gr.wt. 14

380626-192

8:10 P.M. Night hawks flying tonight and a few last night at camp.
8:40 P.M. Night Hawk flying high and almost indiscernable in the late twighlight, Robin and woodpecker still calling. Up to date at no time has there been more than three bats large or small flying in at air at one time. The ordinary number being two. Wilmer reports extensive Indian camp grounds at Scout Lake. He collected several points and fat scrapers. The style of point being



He also reports seing two deer and collected a nice porcupine skull (797 J.B). Early to bed for on the marrow we were prepare and leave on the Circle Cliff reconnaisance trip.

In leaving our steep Creek station many interesting problems have presented themselves but can not be delt with due to lack of time. One of the more apparent questions to be solved in the near future is the distribution of the Sciurus at the South-east corner of the Aquarius. This problem will deal with all factors contributive to the obvious lacking of numbers in this favorable habitat. Whether it is due to the dying out of the Spruce trees or some other factor will have to be decided later. Another problem associated with the above is the establishment of a research laboratory here to deal with Spruce trees that are being effected by the bark beetles. Being so near the low desert country would suppect a weather cycle influence playing a very important role. A complete record should be kept of all the present acting factors and follow the devastation through so that if such an outbreak should ever occurr again anywhere in the western United States one would at least have of what has occurred in the past and will have a knowledge of what will be effected to occurr in the future. The effect that this forest has upon all animal life associated with it is the one great problem of the Aquarius. How will the populations of mammals and birds be effected by the dying out of this wonderful stand of Spruce. so the problem that should be investigated immediately. Another problem would be to see just what effect the lava cap has upon the distribution of animal forms, for the perpendicular ledges and intervening rock flows no doubt act a barrier. Would there be any slight difference in the animals that are limited to the rock flows that occurr on the higher slides and those slide that are lower down the mountain side and have been isolated from the upper limits for thousands of years? Many isolated slides are available for this study. The faunal distribution up and down the many stream that issue from the Upper Hudsonian Zone and transgress through the Canadian and Transition would certainly be significant and would no doubt present many interesting gradations. Am more than anxious to keep careful check on populations and numbers because I feel that at present the dying spruce forest on top is creating an abnormal situation and if it is effecting numbers would like to know about it.

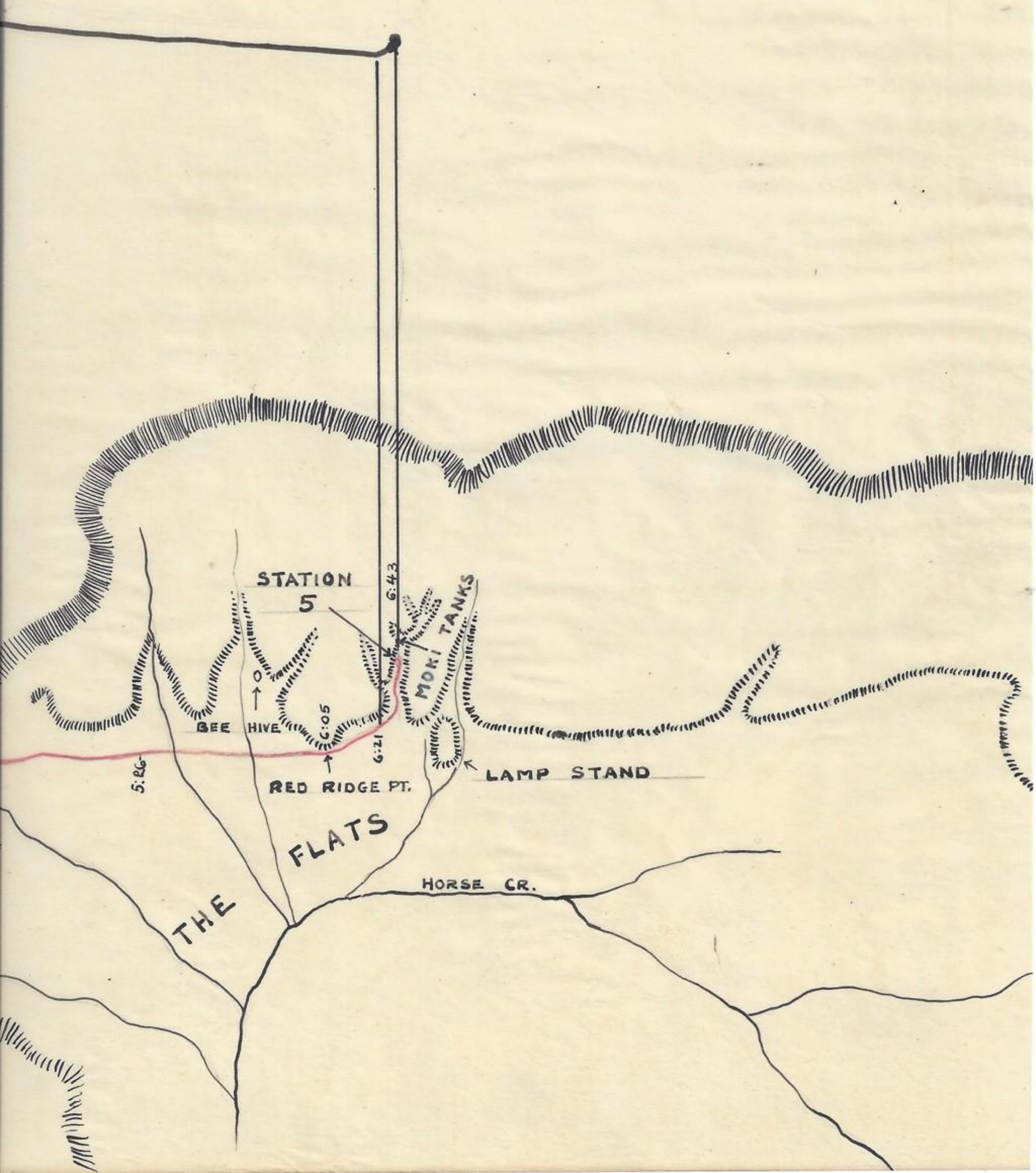
ALTITUDINAL AND ORIENTATION MAP

OF

CIRCLE CLIFF TRIP

VIA

INDIAN GULCH



STATION 3

11:15

0

11:55

12:45

1:00

1:05

1:25

1:40

1:45

2:27

2:40

2:50

3:04

3:25

3:50

4:28

4:42

THE INK SPOT ?

THRESHOLD LAKE

STEEP CREEK

INDIAN GULCH

Stations 3 and 5 — 6/27/38 Steep Creek and Circle Cliffs.

Up early and preparations completed for our three day reconnaisance trip into the Circle Cliffs our object being to look the country over and check on the feasibility of establishing permanent stations for subsequent work. We planned on collecting in our respective fields as much of the representative material as possible. The Circle Cliffs and intervening country is just about as desolate an area as found anywhere in Utah. From our station at Steep Creek the Circle Cliffs appears like a plain that has an egg like shape and entirely surrounded by a perpendicular wall of cliffs of great heighth. The individual who gave this area such ~~an appropriate~~ name no doubt viewed it first from this point because when down within the confines of these high surrounding walls the area loses its significance and the plain changes into a more rugged terrain. The topographical expression of this country changes from the higher view of its distant enchantment to the lower more intimate touch when among the Moenkopi benches near Moki tanks on the heart of this dismal country. The elpanse is about 30 x 10 miles with the more rugged domes along the east side fringing upon the water pocket fold and the mesa like bench to the north and west. The huge domes and promontories on the east side are cut through at several place and the drainage appears to flow to the east but in reality the master drainage is to the west through the profound and narrow chasms that completely dominate the western bench producing a nterical network of canyons. The high perpendicular china wall surround the Circle Cliffs is the Wingate formation of the Jurassic age, very massive, reddish brown in color and palisade like in pattern. The secondary bench running into circle cliffs are Moenkopi capped with a thin layer of Shinarump conglamerate. It is among the canyons of the secondary benches that the famed Moki tanks are situated and the point of our objective and destination. On this trip planned to make a complete census of birds, mammals and reptiles seen along the way and have indicated position and locality by the time correlation. By dropping down through several zones felt that a complete census would be significant, at least indicate the altitudinal ranges of some of these forms. The free-hand map of our course serves as an orientation map with an accompanying altitudinal and grade of trail. The upper section of map indicates the grade of the trail and not necessarily the type of topographical expression that dominates the adjacent country. The time is indicated at vantage points so that all observations can be definitely tied to one particular spot and corresponding elevation. Dr. Beck, Wilmer Tanner, George Cannon and myself left afoot at 11:15 A.M. from Station 3 at Steep Creek with the hope of reaching Moki Tanks tonight.

Stight breeze and a few clouds in sky. Passing the Lincoln Sparrow nest and now hied 5 young but not adult birds at the nest.

11:26 A.M. Vespu sparrow flew up from sidehill. Can hear the song of the Robin, two yellow warblers, seven Rabins, two ~~green~~ towhees, three Eutamias, 2 hummers, one black headed grosbeak. One Turkey vulture flew by.

11.55 A.M. On bench N.E of lakes. At this point ~~down~~ among the dense growth of scrub oak having passed out of the ~~lowest~~ edge of aspen growth about 10 ago. Can ~~see~~ some of the ~~lakes~~ below. The hellside north of us is densely covered with scrub oak and heard first Spurred Towhee there.

11:58. Starting in to Ponderosa pine. Lupine prominent.

12:01 Chickadee calling.

12:05 2 chipping Sparrows sing on tops of Ponderosa pine

12:12 Have been walking normally across this bench and now following down along ridge. First yucca. Lupine in rank growth and appear to be in good health. These flowers are well in blossom while those at are not flowering as yet.

12:19. Tree swallows (?) flying in and out of hole in dead Ponderosa tree. Eutamias calling. Lupine 1' to 1 foot six inches. Passing through beautiful stand of Ponderosa pine. Evidence of old forest fire as some of the trees are scared at base. Wind blowing through needles and gives a pine forest atmosphere. Among the trees are extensive patches of lupine, penstemans and oak patches.

12:35 A lone ~~juniper~~ tree among trees. Can hear chipping Sparrow Puff ball with radial finger ~~along~~ raute, most of them dried and in expanded state. Chipmunk. Service berries present and a nice field of yucca plants.

12:40 The juniper and pinyon as well as the service berry are beginning to present themselves in limited numbers.

12:45. Have dropped down from upper ponderosa belt down to main trail and creek. Chipmunk calling here. Stopped 9 minutes at this point. This water comes from the last lake down mt side

1:00 Spurred Towhee & Eutamias calling. Left Ponderosa pine and now among oak and service berry in equal proportions. First lizard at 1:00 as we dropped down on to bench after leaving point where we hit trail for first time. Sagebrush more in evidence Eutamias calling. The service berry bushes are about the healthiest and having rankest growth ever seen before. They range from 6' to 10' high

1:05 Have dropped down from above flat to this bench of service berry and oak. with a few pinyon & juniper. Service berry 12-15 feet high. This upper end of the bench is artificially watered from the creek that has been diverted from its normal channel and brought down over the brink of the above valley to here. The bench is broad and is bordered by Steep creek on the south and head of Indian Gulch to the north. Five chipping sparrows feeding among service berry together. 2 Eutamias calling. 2 Spurred

Towhees singing. Lizard ran across path. Lizard was seen

1:10. 2 lizards.

1:15 Family of Gnatcatchers, 2 chipping sparrows one singing. Towhee singing. Lizard. Sage 1½ foot high.

1:20. Jack left flat and ran to the south. Chippy singing. Chipping Sparrow singing.

1:25 Now at most eastern end of bench looking down onto another flat below with deep Indian Gulch to the north. Jack rabbit left point. 4 lizards. Passing down hillside through nice patches of manzanita.

130 Crickets calling among the manzanita. 2 Sceloporus, 1 Sceloporus, 1 sceloporus

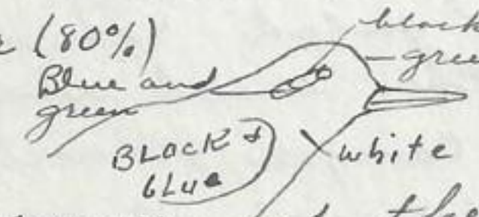
140. Bottom of hill and now crossing flat to the east. One Sceloporus. Chipping Sparrow calling. Here the sands begin to come into the picture and most of the trail from here on is across sandy soils. The juniper & pinyon are dominate with a few manzanita bushes. The Indian Gulch widens and becomes deeper as we follow along its south rim.

1:45 Passing through a strip of large Ponderosa pine at lowest point in open field. Flicker (R.S.) flew east from trees.

1:50 First bare exposure of red and white Navaho sandstones. These can be seen from pines and are directly east from center of flat. The marked trail trends directly east across this flat. From this point on we are in a more closer contact with the bare and naked surfaces of the rugged navaho and Wingate formations. The trail still bears to the east and has slight uphill grade for a few minutes. Sceloporus, 2 male Asilids copulating. Lizard. Lizard.

1:55 Eutamias

1:56 First blasted trail in rock. 25 minute stop. Collected this bird (871 J.B) Sitta pygmaea melanotis ♂ and placed in alcahol jar (80%) feeding



among the tops of the Ponderosa pine in the manner of the nuthatch, first hanging from the undersurface of a limb and then walking down the trunk in a reversed position. They called abnormally vigorously and sounded at times like a chipmunk. Their call is nothing like either the Creeper or nuthatches found in Utah County or higher up on the Aquarius. While this bird was shot the other remained in some tree top and merely showed its concern by calling more vigorously. While resting here in shade of pine heard Spurred Towhee. Left 2:20

2:23. Sceloporus. Sceloporus, Sceloporus. Live oak. Several Bupestid flying about. Eutamias calling. Sceloporus.

2:27. Beautiful patches of manzanita. The trail here has left its east trend and is bearing N. E toward edge of Indian Gulch.

Had been following along east side of Indian Gulch and were just wondering when we were to make our descent into the Gulch proper.

2:30 Rim of Indian Gulch and starting down trail.

2:40 At Gate at bottom of Gulch. 2 Eutamias were seen but did not call.

2:43 Lizard. Swifts soared above. Now following in bottom of gulch with high almost inaccessible walls on either side. Pinyon & juniper dominate tree in gulch and on ledges on sides

2:48 Eutamias. Lizard. Chickadee. A few large Ponderosa pines.

2:50 Large lateral canyon converges here from the N. E. The main canyon now trending to the S. E.

2:51. First water in gulch. Trail on right side of creek. Here the canyon broadens from the narrow gully of the upper Indian Gulch. The walls become more shear in outline and the valley floor supports lovely oak, Boulder and Populus fremonti.

2:56. About the nicest grove of oak I have ever seen. Chrysothamnus bordering creek edge and by 300 the growth increases and evades the canyon floor. A small mourning dove flew by. On the west side of canyon the walls are carved into odd and interesting forms and figures.

3.04. Crossing creek. The most impressive sit from here are the massive wingate formation that can be seen at the end of this S.E trending canyon. The stately Ponderosa pine are still hanging on and a few remain on canyon walls particularly at base of perpendicular cliffs on right side of canyon. Sceloporus. numerous swallows. (Sp.). Swifts continuously flying up and down. Canyon. Swallowtails in creek. Spurred Towhees (2) singing Stopped for 14 minutes at spring that enters creek from west side. Here the erosional walls of creek bed are 25' high and are of red sandstone strata. Joint grass grows along creek edge. Teasing. Sceloporus. Woodhouse Jay calling. Minnows in creek along its entire length. Sceloporus. Sceloporus.

3:25 Arrived at spring on left side of gulch. The water is very cold and adds quite a little water to the creek about 20' away. 2 Cooper Hawks (?) flew together down canyon about half way up canyon walls. Sceloporus. Sceloporus. 2 mourning doves on ground. 2 more doves on ground. Sceloporus.

3.42. 3 doves left ground among the juniper and pinyon.

3:45 Say Phoebe. Monarch butterfly. 2 Meyarchus c. crescens on brush at edge of wash. Entering the convergent point of the large canyon entering from the north. Indian Gulch now trends to the south.

3:50 Dropped down into erosional gulch proper where two creeks meet. Water at present only coming from Indian Gulch. From here on the canyon widens considerably. This gulch is cut through a broad canyon floor of sediment with towering wingate walls on either side. A short distance down from convergent point the erosional walls of this gulch that has cut down through the canyon

are 33' high in some places. Here the purple shales of the Chinle are exposed. White and Swallowtail butterflies are frequently seen. Sceloporus. Still in trosional gulch and will remain along the water course the entire length of canyon.

3:55 Creek averaging 2'1/2 feet wide and supporting many minnows and polywogs. Scelooporus. Chipping Sparrow singing:

4:00 Lizard, Scelsporus, Scelsporus, Chipping Sparrow flew over gulch calling. Scelaporus, Scelaporus, Scelaporus.

4:10- Stopped for 10 minutes. Here the Moenkopi formation is exposed and almost perfect ripple marks are found on the large blocks that have been exposed. Have been following down gulch proper with trosional sides 20'-30' high. The water is still disappearing and reoccurring in damp bed of gulch. The gulch here is about 50 yards and represents about the average width. It is still cut down through broad canyon floor with on the level is covered with Tridenta and Chrysothamnus. At several points along the gulch the Chrysothamnus is revegetating the once fresh trosional sides. The profile of these sides show that at one time there has been many gullies that have been filled in and now exposed on the sides of the new gully just being formed. The gnats are annoying and the sun is bearing down so that the shade of the west wall is preferred to the more exposed part of the gulch.

4:25 Have been watching the beautiful exposure of wingate formation on the left side of canyon but now it ends abruptly in a perpendicular profile. The gap that it leaves is noticeable and the wingate is seen to be continuous, however to the south. It is this discontinuous section of the wingate that we are to pass through to enter the flats of the Circle Cliff. to the east.

4:28. Leaving gulch and Indian Canyon and trending east up small gulch to divide leading down into Circle Cliffs.

4:35 Scelaphorus.

4:40 Group of Gnatcatchers feeding in junipers and pinyon. Have been passing over the Chinle formation as as we approach the divide the silicified tree trunk fragments become more numerous in wash bed.

4:42. Divide looking into circle cliff country to the east. This wind divide is on Chinle formation with the wingate formation to the north and south. Starting down grade onto flats of the circle cliff area. Scelaporus and six Psaltriparus m. plumbeus. feeding in a group among the pinyons & junipers.

4:50 A Coyote left trail 40 ahead of us and crossed gulch to other side where it remained on top of a ledge for a few seconds before it finally left. It watches us at 150' with ears and eyes just peering over rocks on ledge. A deep canyon, 20',

heads here. but soon returns to shallow gulch. Can see the lamp stand in full view. across the flats to the east. It is in line with the blue outline of distant mt. Ellen of the Henrys.

4:55 Group of eight Psaltriparus. m. plumbeus feeding in jumpers. Two Cnemidophorus tail marks in trail. Eutamias rand over rock to left.

5:10 Group of Psaltriparus m. plumbeus feeding in jumpers and pinyons.

5:14 First Cnemidophorus but several tail marks in sands across trail.

5:26. Leaving the jumpers & pinyons and crossing the broad flat of Tridentata. Two bluebirds flew up from sagebrush.

5:30 Stopped for 15 minutes. Several very likely Dipodomys burrows in sands. Beck picked up arrow point. Leaving. Lizard. Chipping Sparrow. Fence line with 6' deep gully beneath it, probably having been eraded away since the fence was placed there. Getting back into jumpers and pinyons again.

6:05 Red ridge point. This is the point we were interested in crossing because Moki tanks were now not over 0 1/2 miles beyond. Since we left the west side of Circle Cliffs we have been passing by the mouths of several canyons coming from the country to the north. These canyons all issue from the Moenkopi formation and the characteristic profile, to the left across the entire trip across the flats is the terminal bench of Moenkopi capped with the lighter white Shinarump. The bee hive formation in the canyon floor in canyon west of red ridge point is a very good land mark. The terminal of the Moenkopi & Shinarump at red ridge point is not like the other points. It differs in that the end is not perpendicular like is found on the edges of the lamp stand and termini beyond but is sloping with one or two steps. The red ridge point is an extension of the point and runs out into valley for several hundred feet. This base, low ridge, formation is only peculiar to this bench terminal. The trail crosses over it at its southern end. and then continues N. E to mouth of the large drainage canyon where Moki Tanks are found at its head. This canyon is the first one west of the Lamp Stand and is the only one that has a white formation on the canyon floor level when view from the open flats at the mouth. It is not to be confused with the bee hive in canyon to the west of this one. It is rather peculiar why this white formation should be there where the Moenkopi should logically be. This land mark of white formation and coupled with the position from lamp stand gives a positive assurance of it being the Moki Tank Canyon.

6:07 Leaving red ridge point. Group of Psaltriparus m. plumbeus feeding in jumper & pinyon trees. Few Stanlia plants but present.

6:10. Psaltriparus calling.

6:20 Bird calling with continuous warble like Cyanomys.

6:21 Cottontail, Eutamias, Pinyon Jay calling.

6:30 Have crossed the open sagebrush flat at mouth of canyon and now at upper end. This opening is surrounded by a definite line of junipers and pinyon. From this point the Shinarump cap overhangs the Moenkopi about 1 block N.W. Can hear R.S. Flicker calling and two mourning doves flew by and proceeded up canyon.

6:35. Divide of the canyon, one canyon turning to the N. W and and to the N. E. The junipers and pinyons cover the tops of the benches and sidehills while the canyon floor proper support a very rank growth of these same trees. Leaving forks and proceeding up right hand fork. Heard Gnatcatcher calling and has a varied combination of notes and calls. A monarch butterfly flew down canyon. Working up this narrow canyon with bare rock sides and many ledges with junipers & pinyon trees throughout and especially in canyon floor proper, arrived at Moki Tanks on left side of canyon at 6:43 P.M. Rain clouds above and good wind blowing. These tanks cannot be seen from canyon floor except at certain times when the pool become full in canyon floor and bordering the cliffs and side gulch where tanks are located. The water has cut down through the side of the canyon and during its erosion has produced a deep narrow cut down through solid sandstone. At two points in this narrow cut the water has dropped down a few feet and has produced the pot-holes that are given the name of Moki Tanks. To get to these water basins one must climb thirteen feet up wall from canyon floor. At this heighth the canyon or deep cut is fashion in the solid rocks. The only indication that this cut supports water when veiwed from canyon floor is a one foot deep groove that the water has cut in the solid rock from the 13' level down to the drypoal below. As one works back into narrow cut he finds two pools of water. The first tank is at point where cut enters canyon and is egg shape in outline. It measures 5'0x6' by 4½' and 2½ feet deep when full. It is now 1 foot below highest outlet level and supports tadpoles and insect life. The second tank is 22½ feet from first one and measures 6 x 8 and 3½ foot deep. when full. It now is 1 foot below outlet level. The canyon trends east and west and probably receives very little sunshine. The second tank supports numerous water striders, mosquetoe larva and dytiscids. During a slight rain for 10 minutes the lower tank raised 1/3 of an inch. No water came down the narrow cut but rain water came down slopes of walls and entered pool. After looking over our new water supply decided to go slow on our limited water that we still had in gallon canteen. Found a cave about 1 block down canyon on west side of canyon wall about 35' above the canyon floor level. where we were protected

from the Kaibab and wind. The cave was about 40 long and was recessed to allow complete protection from the elements. after a snack left with traps to set as many as possible before dark. Was particularly interested in trapping the sandy canyon floor for Dipodomys and possibly Perognathus. George was trapping the canyon slopes among the rocks and ledges. Set my traps on canyon floor in vicinity of the lower forks. Here the sands are favorable for the Dipodomys. The pinyons and junipers are found among the sands of this area. with chrysothamnus and Artemesia occupying the more open exposures. Numerous holes were seen but nothing indicating that the Dipodomys were active. at 8:30 P.M. while investigating for holes saw a Tongaroo rat run into hole under protection of Artemesia so set trap there in hopes of scoring one on his return to feed. This was at late twilight Succeeding in finding several hole but not satisfied with the amount of recent activity. Heard at 8:00 a nighthawk in the air. Run across four long-eared Owls in canyon. Two screech owl sat on top of dead juniper tree at 20' away while another called only a short distance away. Returned to camp. 9:00 P.M. = 64° F. Skies cloudy with black clouds in the south. 10:30 P.M. = 65° F At 10:30, having seen all the shows playing tonight and raining cats and dogs outside chose to remain ~~in side~~ this evening in a humble home dear to all. Wilmer was the martyr of the day for he sacrificed the use of a comfortable sleeping bag by remaining on fire duty the entire four shifts of the night. As a returning honor was decided that he be exempted from all dish washing for the next two days. In all sincerity spent a very enjoying evening around the camp fire, ~~dining~~ and eating in the manner of the prehistoric pueblos who at one time in the distant past sat upon this same cave floor and thanked his heavenly spirits for the accomodation that we were so primitively enjoying tonite. Beside the pot-sherds found associated with the cave, several pictographs bore mute evidence of prehistoric inhabitation of this cave.



Station 5 - 6/28/38 . Moki Tanks.

Awakened at dawn after a pleasant night of fanciful dreams. Considering the trend of the weather was not surprise at the thermometer reading of 65° F at 7:05. after breakfast left for trap route to bring in animals before sun effected them. at 7:18 started down canyon to inspect line. met the family of four


1-6-27-38

long-eared Owls in bottom of canyon. These owls kept in the bottom of canyon at all times and were seen on several occasions. Heard Gnatcatcher calling in a screaming mechanical manner. Six Baeolphus inornatus griseus were feeding in canyon among the junipers. Their call is similar to the Chickadee and until it is heard several times one would confuse it with the chickadee. Collected a (806 J.B) Cottontail 2 blocks below tanks in junipers and pinyon with Artemisia and chrysothamnus patches near. At forks below camp heard gnatcatcher calling. also Rock Wren and two Eutamias. Was in bottom of canyon when I heard Eutamias and started in after them. They were wild alright for they all lead me a merry chase and without even getting a shot at them.

Trap line results.

22 B (803 J.B) Perognathus. Caught in trap set for Dipodomys.

Trap no. 11B. (705 J.B) Dipodomys ordii cupidinus. Sandy canyon floor at base of artemisia bush. Pinyon & firs surrounded. Just east of overhanging Shinarump formation

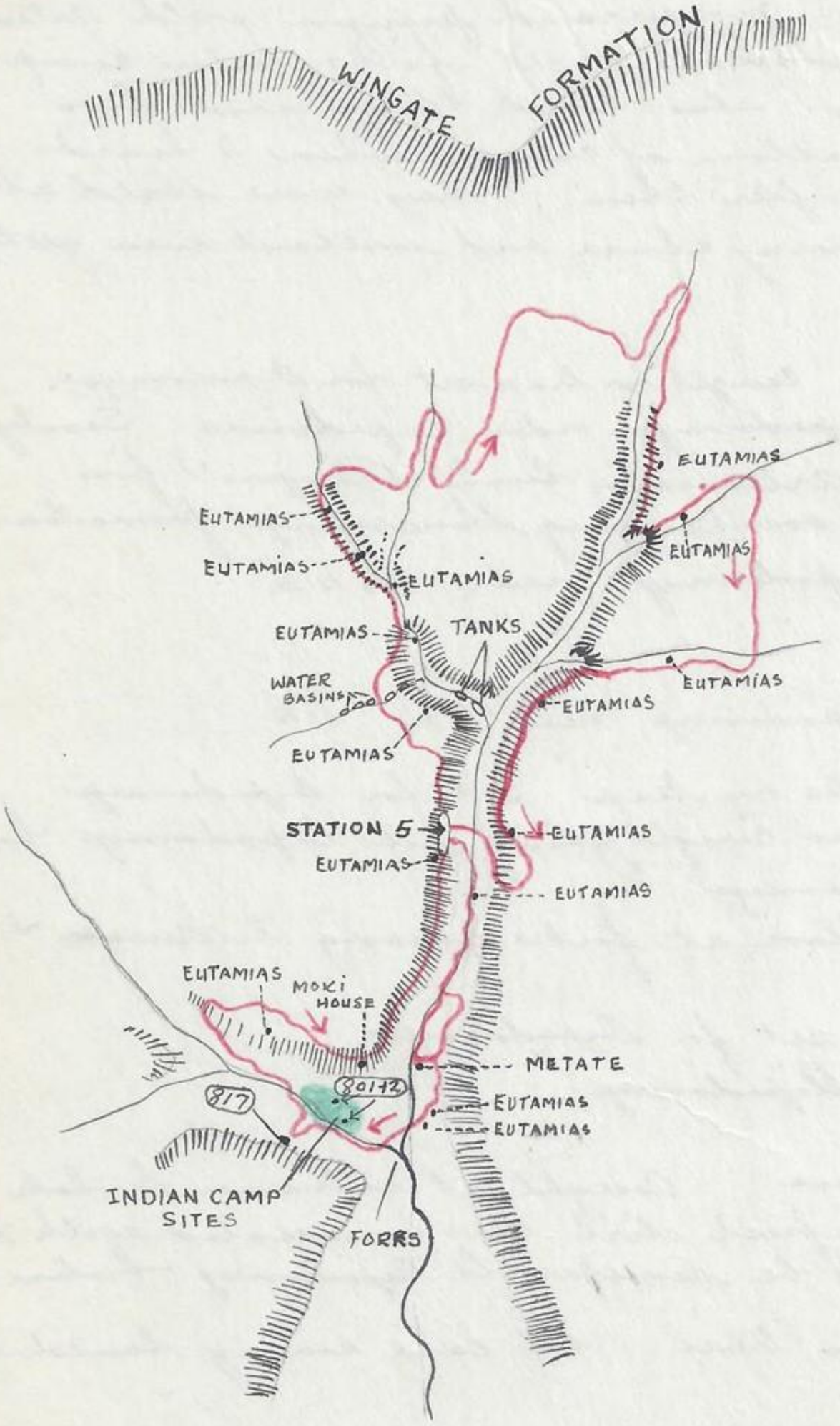
16. Sprung. Set for Dipodomys near no 11 B.
4. Sprung " " " " "
13. Unaffected " " " " "
24. Sprung Set for Dipodomys near no 11B.
23. " Ibid
15 " Five tenebs on trap. Set for Dipodomys
21 (800 J.B) Perognathus caught going into Dipodomys hole.
1. Sprung. For Dipodomys.
3. Unaffected. Canyon floor at forks among artemisia & chrysothamnus.
9. Perognathus. In trap set for Dipodomys
18. Sprung. Set for Dipodomys
12 Unaffected. Ibid.
7 (802 J.B) Perognathus. Caught at entrance to hole. Several other holes and fresh dirt was associated with this hole. appeared to me to be similar to Dipodomy holes
15. (801 J.B) Perognathus trivi. At cave among boulders of calapsed roof.

Collected (807 J.B) Dendroica nigrescens feeding in pinyons at ~~bottom~~ of canyon at forks. at 9:00 A.M. Overcast skies and no wind. Also this morning saw a Jack rabbit, a Myiarchus cinerascens cinerascens, and several swifts flying above canyon. Back to camp. 9:50. Temperature then 69° F. Installed these specimens and measured the cottontail. (806 J.B) Skull only.

Length	386 m.m.
Tail.	47 m.m.
Foot	91 m.m

after airing these animals left them to throughly cool

before packing in bedding for their 2 day journey back to Step a. Station. George and I then left camp to collect for several hours before leaving for Indian Gulch, our destination tonite. Course followed and area included in survey. Left at 9:50 with a few drops of rain but no wind. At the forks two Dryobates villosus leucothoreutes (?) called vigorously and kept well out of gun shot. flying from one juniper to the other. A red tail hawk flew above a favored canyon side and kept screaming Located a metate 30' up east hillside and 430' up right hand fork from where left hand fork stream bed converges. Left it there 15' from north end of lower set of cliff at south edge of large flat rock. Pinyon Jay & redtail still calling. Flicker calling at forks. The Dryobates v. leucothoreutes appears to me to be calling abnormally. The Sceloporus more sluggishly. Before leaving forks and working up left fork saw a mourning dove fly by. About 2 blocks up fork found numerous surface indications of old Indian camp site on bottom of canyon floor. Collected representative pottery and arrowpoints here. At this site collected (810 J.B) and (812 J.B)



Baeolophus inornatus griseus in pinyons and junipers. These birds are probably the small group seen this morning about 200' below camp in the right hand fork. Since that time they have moved down to forks and up to this point in the left hand fork. Was more impressed than ever by their chickadee-like call. When these were collected the rest merely flew into adjacent trees and showed their concern by calling more frequently and continued to feed. Collected (817 J.B) Citellus grammurus grammurus on side hill below moenkopi and Shinarump Cliffs. It had evidently been feeding at edge of canyon floor. While walking along base of talus slopes on south

side of canyon found numerous Neotoma homes. One was constructed of pinyon pine and artemisia stems (dry) with chips of shale and pine cones. One stick measured 13" long and 2" wide and 1/2" thick. The accumulation was packed under protection of rock and measured 5' long and 2' high. At point where there is a division in canyon saw a Jack in gulch, two House finches and another small group of Western Gnatcatchers. Decided to return to camp and pack mammals and birds collected last night and to preparing the material collected so far this morning. While working along north side of canyon on return trip attempted to run down Eutamias but was foiled by it attempts in escoping. Passed Moki house on point to find that it represents two parallel walls only. Sand has already be razed. Camp at 12:00 with Temperature 77°F. Took care of material and soon back on trail of the wild chipmunks. Our objects this morning was to procure series of Eutamias regardless of hardship or energy. and so far we have not been able to catch up with them. but we are still going to allow 4 hours of the time we should be spending on the trail to Indian Gulch in hunting down these forms. Left cave and gained mesa top hence to head of Moki Canyon. A few ponderosa are found at the head of this short canyon. Directly west of Moki Canyon beyond the upper rim of blind head are located several small pathrles that supported fine rain water of last nights storms Two Eutamias were seen at the head of this canyon. These two chipmunks were on edge of canyon rim and when approached would run as long as it was chased, never choosing to hide among the rocks. Frequently they would lead one up a step hillside and when at top would cease their calling and disappear. Their continuous calling was all that kept us on their trail. Followed up this canyon and saw two more Eutamias and one Citellus g. grammurus. The chipmunks were on rim of wash and ran ahead when approached. The Citellus was in bottom of canyon and ran up east side of wash to hole among rocks. Another Eutamias on rim of wash but ran out of site. By now we could see our mistake but now we had a plan in which we should be able to procure our specimens. Now we find that they are found on the rims of the washes that are cut down through the mesa-like areas, so when we saw our next Eutamias running ahead along rim I stopped and remained with gun while George circled out around and intercepted its path. It then started back along rim toward me passing chasing the chipmunk directly into the barrel of my gun. Collected the above at 1:20 (799 J.B). From here crossed the more or less flat mesa to base of Chinle below the prominent Wingate formation. Examined a pile of horse dung

along side of trail. It was about 1½' high and covered about 4 square feet. assumed that it was of the wild horse.
1:30 P.M. Nice silicified wood sections in washes some measuring 1 foot in diameter. Following along rim of wash saw a Citellus g. grammurus run into pile of rock on rim edge. Following up small lateral canyon came unexpectantly upon a Eutamias. which ran up trail and over to ledge and then ran along canyon rim. We followed its call for about 2 blocks and then it stopped calling and we were at last as to where it might have gone. Saw cottontail under rock with head and ears showing, approached it and it disappeared down hole under rock, but for a minute that we had a rabbit cornered. Large log in Shmarumpf (?) light colored and as highly silicified as those found in the Chinle. Saw Eutamias 100' ahead on rim of canyon: Followed for 1½ blocks and still could hear it calling ahead. Three other Eutamias seen on mesa bordering canyons but have decided by now that it will require a long range bertha to get desired results.
While crossing flat mesa observed several deer tracks (?)
2:30 Collected (808 J.B) Psaltriparus minimus plumbeus feeding in flock of 20 other birds. These birds were feeding among a flock of six Titmouse. among the pinyon trees. on the mesa top. When shots were fired they remained in vicinity but soon left calling. Collected (811 J.B) Myiarchus c. cinerascens on mesa near canyon. Was resting upon dry limb of Pinyon tree. Not over 20' from above flycather called a (809 J.B) Empidonax wrightii (?). The mate of this bird fought the ash-throated flycatcher before being collected.
The gnats were very annoying.
3:05 P.M. Chipmunk in bottom of canyon near camp
3:15 After visiting a cave on east side of canyon that looked like a Moki Tank from camp but was nothing of any significance. After visiting this cave returned to camp. When arriving at camp a Eutamias ran up hillside to top. Temperature at 3:15 = 73° F
The area covered today is all within one mile radius from the Moki Tanks. During the time we were in the field today located 15 Eutamias and am more than satisfied that they were all Eutamias quadrivittatus hopiensis. Three things characterize these animals in the field. First their non-stop flights generally leaving at about 125' in head of approaching danger. Secondly. their particular liking of the rim of the washes and canyons. and lastly their sharp vigorous call. Soon prepared material for packing and by 4:00 were packed and ready to leave for Indian Gulch. Wilmer & Dr. Beck had left this morning and we were to meet them at our evening camp in the Gulch. Left Station 5 at Moki Tanks with thunder clouds in sky and Aquarius blanketed in a film of low fog and mist clouds. Following same route back as followed yesterday. While passing by the forks.

580626-20

studied geological profile of this mix up and still at lost as to the logical answer. The stratum dip to the north but not abrupt enough to account for the the total replacement of of the Shinarump formation that should normally carry across from the overhanging Shinarump to the north side of Dry Forks. A normal fault could account for it but still the formation on north side is absolutely foreign and does not fit in ~~any~~ the sequence of formations above the Shinarump. I know of no stratum in the Chinle that has this type of rock. It looks more like navaho. Leaving the Moki Tanks Canyon and soon making progress across the flats. Observed a Pygmy Nuthatch among the junipers and pinyon tree on west side flats and collected a Psaltriparus minimus plumbeus about 1 mile east of divide (814 J.B) feeding in association of the Gnatcatchers. It was in own flock of of about 8 birds.

5:30. Low clouds capping peaks on west side of Indian Gulch. and distant Navaho peaks. Beginning to rain and rather cool. Arrived at divide at 6:00 P.M and leaving the circles Cliffs behind followed down slippery trail to N.S. trending Indian Gulch where we arrived at 6:13. Arrived at point where Indian Canyon leaves the N.S trend canyon and bears to the N.W. at 6:40 being uneventful along the gulch. Collected a Spurred Towhee at 6:45 while singing in top of tree. Four others were seen singing and ruffling feathers in rain. between 6:45 and 7:00 when we reach first spring on north side of canyon. Has been raining steadly since 600 P.M. met Wilmer & Beck and commenced our search for a water proof cave to shelter our water soaked bodies. Investigated sides of canyon wall from spring to Indian Cave at Gate where trail leads up out of Indian Gulch. Only one other site was at all favorable and it was located about 300' up lateral canyon leading N.E from a point where Indian Gulch trends west from its N.W. trend. This one experienced proved to me and explained just why one doesn't find more Indian site in the many favorable looking caves. It is for this one reason that they are not protected from the rain. Many sites are seen in good weather that appear to be good shelters from the elements but when the real test comes along one finds that the water creeps down over the apparently protected roof above and drips on the floor of the cave. and then again the rain drops at edge of cave and splashes back on to protected floor. I have since wondered if the abnormal congregation of cliff inhabited people is not in a direct ratio with the available or limited caves that are water-proof in the vicinity. and not because of the gregarious tendencies of these ancient peoples.

Stayed in the Indian Cave at a point where trail starts up out of wash on the south side. The cave showed signs of being inhabited at one time as evidenced by the cedar bark in one layer of the floor. At the west end an Neotoma had constructed a large house of dry sticks which solved our problem of dry wood. With a fire burning all night we faired very well except for the Cacti needles that in some manner had penetrated our sleeping bags. * 6/29/38 Next morning, having rained the greater part of the night we collected ourselves together and hit the trail for our steep A. Station on the Aquarius. Left camp at 6:50 A.M. Reached gate at 6:54 from where we could look back and see cave on north side of Indian Gulch just a short way down the canyon.

7:15. Reached the brink of Indian gulch making the return trip in 21 minutes where it took only 10 minutes on our descent trip. From here watch a raven work itself out of canyon. It would fly back and forth along the canyon walls and when finally above the brink of the canyon flew to the north. To the north of here, across the canyon is a high sloping mountain covered with a dense growth of pinyon and juniper and about midsection of this mountain the mist clouds were situated. above this point the mt. was in obscurity while below clear on several other peaks to the east the mist clouds were clothing the upper portions. This clouds were all moving in an easterly direction. No other bird except the raven observed on trail but of Indian Gulch. Saw one mammal however. a Eutamias called but did not act like Hopi. The ground was damp from last nights rains and hiking very pleasant.

7:23. Towhee (Spurred) calling

7:30 1st Cut trail in rocks. Heard two Eutamias. 5 min. Stop. mistletoe in juniper along side of trail. Douglas fir (?) among junipers and pinyon.

7:45 Arrived at Ponderosa flat and checked on life here for few minutes. Green-tailed towhee called from top of Ponderosa pine 60' high. Its normal habitat of manzanita and oak was directly beneath it. Before leaving this Ponderosa strip collected (813 J.B) Sitta pygmaea melanotis. It was associated with another bird and had insects in its mouth. Called very loud for a bird of this size. a Nutcracker was seen here and called in its sentinel like manner. Leaving the flat we proceeded up main trail which follows up grade on the north side of bench and finally comes out on top about mid-way. Beginning from flats heard Chipping Sparrow calling, Spurred Towhee singing. Chipping sparrow calling. Chipping Sparrow calling. 2 Spurred Towhee singing. Eutamias calling, one ran up side hill but stopping frequently. Can hear other birds but could not determine. Several deer tracks

Hummer passed. Flicker passed. Spurred Towhee called. Two Eutamias left at 50' and ran up side hill. stopping frequently to look back. Jack rabbit left and ran up aber hillside to top of bench.

Collected Eutamias adsitus in tree at 60' calling loudly and vigorously at 8:50 near top of bench level. (816 J.B)

Collected another Eutamias adsitus (816 J.B) 150' from above and on top of flat bench. Now on top of bench about at the halfway point at 8:56 A.M. As we proceed along can hear Spurred Towhee. Two Spurred Towhee. Examined Green-tail Towhee nest at base of small pinyon tree 3' high. The brooding bird left at 5 feet and ran over the ground like a mouse. nest held 2 eggs and service berry, pinyon and juniper trees in association. Both birds present.

Passed Eutamias in top of dry limb of pinyon tree.

Four bluebirds flew by. Chipping Sparrow singing. Spurred Towhee singing. Chipping Sparrow singing.

9:18 Arrived at head of flat and now making our ascent up hill to next level and likes .. Spurred Towhee singing. Chipping Sparrow singing heard like. Arrived at top of hill but still following along diversion creek. 5 min stop. 2 Spurred Towhees singing.

9:35 Leaving point where creek is diverted and started up trail toward Threshold Lake: 2 Chipping Sparrows calling. Robin. Chipping Sparrow singing. Spurred Towhee singing. Chipping Sparrow singing. Spurred Towhee singing. Chipping Sparrow calling. Spurred Towhee singing. 2 Chipping Sparrows calling Utah Jasy flew through oak calling. Arrived at Spadefoot pond for 30 minute stop. Gorge located the Spadefoot in this pond and stopped to examine. It was evidently a breeding pond for out of the 30 toads that were observed only six were single the rest were in copulation. When seen in water were either standing in shallow edges or swimming about in center. with the male assisting in the propelling. When taken from the water the males hung on tenaciously while being handled. The ♂ grasped the ♀ with front feet around her addomen just in front of the hind legs. The ♂ hands touched beneath. They were singing when first discovered. Frequently one would call with a hoarse bass call. The pond of water measured 20' x 15' with grasses growing throughout. The pond was at a low level and could be four times as large. no outlet. When handled were very slimy and sticky. One pair of toads collected had 10" string of eggs. and were attached, both being in water. all toads were found directly in the water. Oak surrounded pond. When 9 pairs of these Scaphiopus hammondii were collected and

placed in → 380629-209 ← called incessantly all the way to camp, but
bag they
when placed in cage ceased their calling abruptly. Out of the nine
pairs of copulating toads that were carried in bag. only three pair
remained in copulation when arriving at camp. Leaving Spade-foot
pond and following up trail to Threshold Lake. On way heard
4 chipping Sparrows and 3 Spurred Towhees, and one ♀ Black
Headed Grosbeak flew among the oak trees. Arrived at Threshold
lake at 10:33 A.M after a 3 minute walk from Spadefoot pond.
The trail enters from the N. E corner. Named this threshold
lake because it is the last lake of series and so at the
threshold of the Aquarius, beyond which is the low desert zone.
a red. head duck left grass and sedges on standing water
and swam out into middle of lake. It preened it feathers
and was very loathe to leave the area. When Dr. Beck ac-
companied the lake a ♀ red head came out of growth around
edge and joined it. Heard also at this lake a Spurred
Towhee, 2 Tanagers and several blackbirds. (R. winged) near
the shore. Since last night a 1' high alluvium was formed
at intake of this lake. It measured 10' long and 8 feet wide
and covered the vegetation on the north end of lake. Left this
lake and on way to Duo lake saw Robin & Flicker. Just before



1-6-28-38 (INSERT)

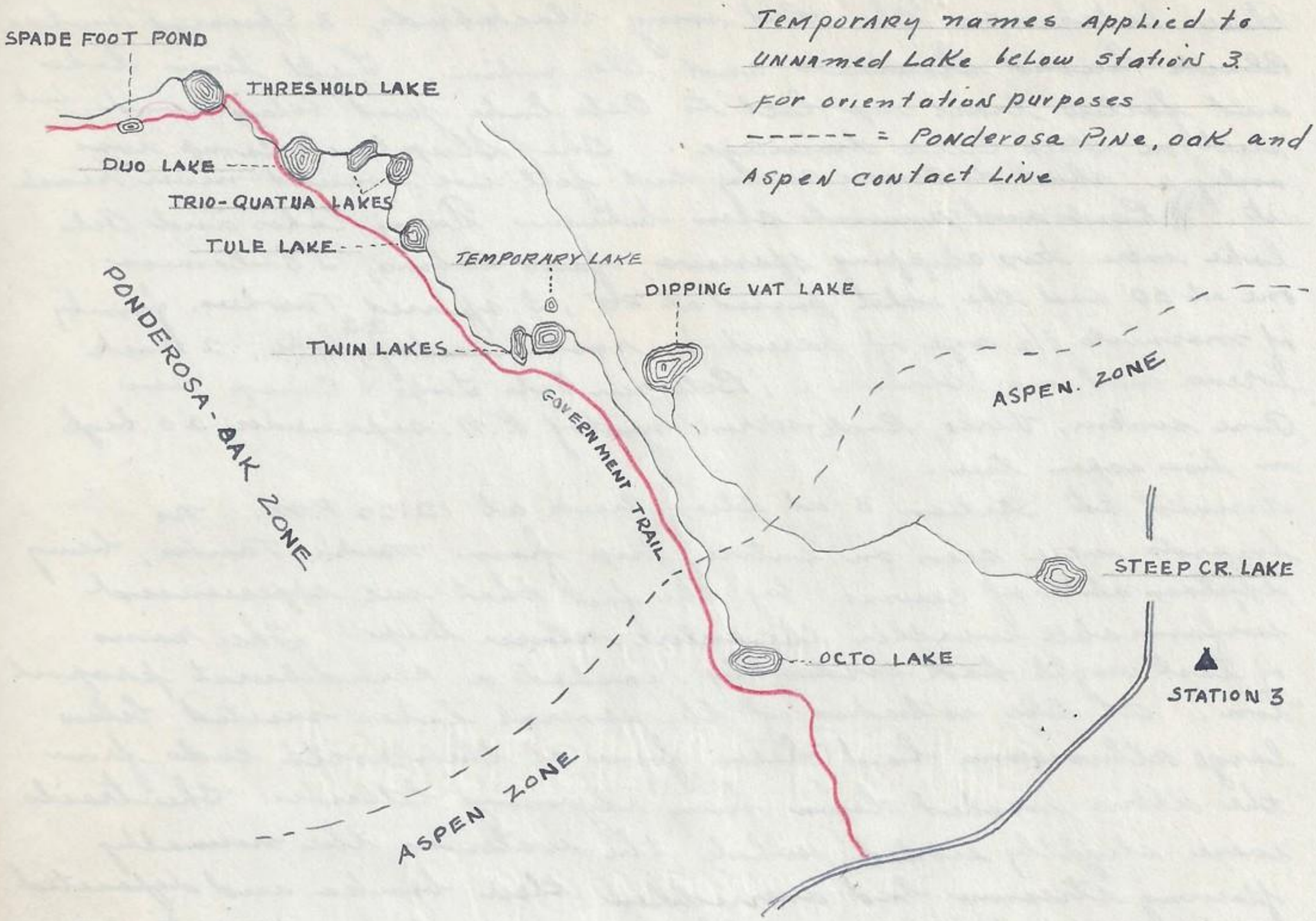
arriving at Duo lake snapped
picture of Threshold Lake below
showing the gateway to the
low desert country beyond. The
trail leaves the lake at N. E corner
and follows to the east. In gain-
ing entrance to circle cliffs one
must be sure to keep to the left
of the flat top mesa to the left
of the picture. Oak dominates the tree growth and but an
occasional Ponderosa Pine. Arrived at Duo lake at 10:50
at this lake saw bluebird, robin, Brewer blackbird, salamander.
at the north end of this lake we found a similar alluvium deposit-
ed last night. Except for a fring of grass growth bordering lake
the alluvium covered all other vegetation on shore line. This alluvium
measured 1 foot high 75' wide and 75' long. Upon this alluvium
George picked up 4 perfect points that had been washed down
from above hillside and had come to rest upon this alluvium.
Leaving Duo lake at 10:05 for Trio and Quatro lakes. Heard
Spurred towhee on way. Trio & Quatro are usual and in near proximity
to each other. Leaving these lakes were left for Tule lake
where we saw 2 ♂ Red. wing blackbirds, Utah Jay, Black headed
Grosbeak and a Spurred Towhee. This lake is entirely filled with
vegetative growth and supports patch of Tullis at it eastern edge.
Left here and at 11:25 arrived at Twin lakes. These two lakes
are in juxtaposition being intercepted by strip of land. The east



lake takes on the shape of a cresent. On our arrival a mallard flew off the lake.. Other birds associated with these lakes were the Red wing blackbirds, 3 Spurred Towhees. Black-headed Grosbeak, and the robin. Left twin lakes and follow trail up hill to Octo lake just below road but still on Steep Creek drainage. The Steep Creek camp was only a short distance away but felt we would never reach it. Birds and animals seen between Twin lakes and Octo lake were. two clipping sparrows, four Robins, 2 Eutamias, one at 20' and the other passed at 30', 3 spurred Towhees. family of marmots 1/2 size of parent in rocks west of Octo lake, 2 rock wrens and one Hermit. Between Octo Lake & Camp saw Pine siskin, Vires, Rock Wren, nest of R.N. sapsucker 20 high in live aspen tree.

Arrived at Station 3 at Steep Creek at 12:22 P.M. No lizards were seen on entire trip from Mahi Tanks, being explainable of course by the fact that we experienced unfavorable weather the entire return trip. The rains of last night had evidently reached a cloudburst proportion. At the intakes of the several lakes visited below large alluviums had been form at their north ends from the debris washed down from adjoining hillsides. The trails were slightly eroded while the water in the normally flowing streams had overredden their banks and deposited gravel and debris upon the grasses and plants which now were lying flat in direction of the floods course. Many of the more abruptly sloping hillsides showed signs of active erosion. To determine the degree of damage done to nesting birds who used the adjoining creek sides, revisited the 5 Lincoln Sparrow nests near Camp that I had had under observation and four out of the 5 had been destroyed by the high waters and shifting debris. The family of five birds were destroyed while the nest at camp had gravel up to nest edge and water within nest. No young birds were in evidence when visiting these nests of dead birds. After a few hours of recuperation began packing for the morrow. for we were leaving our Steep Creek Camp and going to Bosy lake to establish another base. At 7:00 P.M tonight watched family of Gray-headed Juncos feeding among the willows south of cabin. The young one produced considerable noise as they followed closely after the mother bird who was pecking off the insects at the base of the willows. Retired early tonite just because we felt like it.

380629-211



Temporary names applied to unnamed Lake below station 3 for orientation purposes

------ = Ponderosa Pine, oak and Aspen contact line

* Stations 3 – 6 6/30/38 Steep Creek and Pasy Lake.

Through breakfast and ready to leave station 3 at Steep Cr. at 10:30. Our objective and destination today was to make observation along road and establish camp at Pasy Lake. Left and planned on correlating observations with mileage meter. Started for Boulder at 10:30 1.M with mileage at 81.6 at Cabin

83.2 Flicker across road.
Eutamias
Vulture soaring on air

84.4 Flicker

84.7 A creek where Thermopsis montana and Iris missouriensis are growing in beautiful patches. The Thermopsis is in prime of its blossoming stage while iris have just passed their flowering period. Oak, Symphoricarpus and aspen line this creek meadow. R. naped Sapsucker flew up from trees and crossed road to willows

85.1 Beautiful aspens and dead oak groves.

85.3 Ponderosa pine coming into picture as we descend this mountain, aspen and oak still dominant.
R. S. Flicker
Lupine in blossom
Hummer passed by calling
Eutamias ran up hillside.

86.2 Three robins and one hummer

86.4 R. S. Flicker

86.9 Among Ponderosa pine which are the dominant tree. Aspens

tonguing down along creek edge.

87.0 Citellus leucurus leucurus.(?)
Utah Jay

86.6 Large service berries coming in. Jumper and pinyon have replaced the Ponderosa pine.

89.7 Robin & Eutamias
Towhee singing
Chipping Sparrow
Gnalcatchers
Blue bird
Wood Pewee

90.0 all gradation of sego lily from deep yellow to white.
Bluebirds.
This zone from 88.6, towards boulder town is the most prolific area of wild life particularly immediately below the lower edge of the Ponderosa pine belt. The trees here are pinyon, jumper and service berry.

94.3 Boulder School house.

96.0 Boulder Post-office.
Birds seen while passing through town: Sparrow Hawk, Brewer blackbird, Chippeng Sparrow, Cottontail rabbit, Bluebirds, Eng. Sparrow, Spotted Sandpiper and yelow warbler.

01.8 Top of east bench above dugway cut in solid rock and looking down into the city of Boulder we had just left behind. Can see the extent of the flood in river bottom and can see how the block-igneous boulders are able to migrate down from the top of the Aquarius to the north.

04.2. Can see only 2 small patches of snow on the rim of the lava cap on top of the Aquarius.

05.2 While riding along counted number of junipers and pinyon trees bordering road. Junipers 40% and pinyon 60%

08.1 2 vultures flying overhead.

11.0 Traveling along lower edge of Ponderosa belt.

15.4 Sand Creek. Aspen, birch, fir and ponderosa pine in this canyon. For the last few miles have been passing through the ponderosa pine.

18.2 Hell's backbone and skyline bridge. Clarks Crow, Scrofts and red-tail nest swere seen from this point.
Death hollow-head to the west of this vantage point. and when one cautiously steps to the edge and peers over the nearly perpendicular walls to the dismal depths below can readily conceive just why it has been given this appropriate name. Death hollow has been a barrier to Escalantes communication with Boulder and it was necessary for all travel to head this canyon and cross where the skyline bridge now stands.

380630-213



1-6-30-38

Our Commander stands upon the brink of death hallow and views the dismal desert country far to the south, where the fantasy land is obscured by by the purple and blue hazes of the distant horizon.
The assocated plant life at this point would include the Ponderosa Pine aspen, manzanita, Abies concalor. Red juniper, Fox tail pine, oak, Pinus lasiocarpa (?), Mahogany and Siberian juniper.

24.9 at creek that runs into 'The Box' 2 miles up lateral and back road to Cowpuncher Ranger Station. Mr. Astle is the ranger here but had not moved up to his summer quarters as yet. Along this creek were Ponderosa pine, Engelmann spruce, Blue Spruce, Abies concolor, Douglas fir, oak, aspen, and Siberian juniper. This would be an ideal place to establish station. Has good water, camp grounds and ideal mammal habitats.

25.8. back to main road again.

26.9 Bluebird.
Abnormal growth of young ponderosa sapplings 1' to 20' high. All along the way we have noticed these young trees and while mainly associated with mature trees were frequently found in open clearings away from larger trees. Oak 10' high

30.6 Turned off main road and going to Posy Lake. The sign at this point records Cyclone lake six miles
Boulder 28 miles
Escalante 14 miles

32.9 Posy lake Station no 6 arriving shortly after one o'clock. Temperature at 2:00 P.M 45° F. Established camp at camp site no 1 on hill south of Posy lake, and spent the remainer of the day preparing material collected at Aki Tanks three days ago. By keeping them wrapped in bedding for that length of time were able to preserve them without their skin & hair slipping. George set traps route around Posy lake. Through mounting at 9:30 A.M.

* Station 6-7 7/1/38 Posy lake & Cyclone Lake.
Temperature 8:10 A.M 55° F Left Posy Lake this morning and Dr. Beck, Wilmer Tanner & myself drove to Cyclone lake to make observations on top of the Aquarius and to procure skins of Sciurus. Left at 10:05 with mileage at Posy lake 32.9. and drove 4 miles 4 blank to southend of Cyclone lake and without stopping drove



2 miles 6 blocks beyond the end of graded road where we arrived at 10:18 A.M and left car. Beck & I Tanner were going to work the savannahs while I planned on returning to Cyclone Lake by following through the spruce and aspen along the east side of the road in hopes of picking up a series of Lewis. While still on the Savannahs saw a pair of Clipping Sparrows They were feeding young birds. Occasionally they would chase the insects in the air and at one time caught a beautiful red moth. Were seen copulating. Heard pine siskin and Gray headed Juncos singing.

10:31. Dr Beck collected a phrynosoma on broad open savannah. On these savannahs that are surrounded by spruce fir and mainly aspens are found grasses 1 foot high and short matted curly grass. In several sections about 100' apart are small 30' square areas supporting a ranker growth of the same plants and grasses found on savannahs but twice as high. many of these isolated spots show signs of being used by gophers. and had other holes and small mounds. The horned toad was collected in one of these patches. A curlew flew up at 100' and lit in one of these spots where toad was found. It flew 30' with wings held high. We watched it for four minutes and when approached flew away calling. The cyclone lake was 2 1/2 miles away and the nearest wet field being about 3 blocks in straight line away. Walked for two minutes at a normal gait, where curlew had been feeding and counted 41 grasshoppers scraging 1 inch line as they flew up in front of me. In this same area were hundreds of blue Lepidoptera fluttering among the curly grass and Artemesia. The artemesia looked stunted. Ground damp from last nights rain. Few mosquetoes. Left the savannahs and went south into aspen an fir. Could hear 2 Chipmunks calling.

10:03. Male audubon warbler chased ♀ among the aspens and spruce.

10:12 Heard robin giving warning signal and found Swainson Hawk (?) setting on top of spruce. It flew and circled away with robin following it.

Found small nest in aspen trees about 5" in diameter. Placed 10' high, made of course outer layer of spruce branchlets and miss. plant twigs. Lined with rootlets.

Mt. Bluebird calling ♂ Examined spot of ranker vegetation growth and found gopher diggings on peripheral edges.

11:30 Crossing opening with wet meadow and spring in center. a vesper sparrow was feeding on insects on damp and partially boggy ground near spring among dandelions and short grasses. Approached within 8 feet of her and she just walked around me but finally flew. A pine siskin also left spring area. Muddy in places in south end but no water except at north

and around spring.
11:34 Pine siskin flew by. Marsh marigolds (?) at extreme south end of marsh where little standing water remains. Swainson still circling overhead. Gopher digging very common over entire savannah but especially around favorable areas
11:36 Beginning to enter heavy stand of aspen, spruce & fir.
11:42 Heard three And. S. Thrush sing. Heard a Sciurus calling and started toward direction from whence came the sound. When near it stopped and I sat down to wait further indications. In a short while it began again and was seen at base of Engelmann Spruce where the ground was literally covered with a blanket of spruce cone scales. Collected this one (819 J.B) when the above was shot another Sciurus began chattering 200' away and continued to call until within 40' when it stopped. When within 60' of tree could see it on dead limb of Spruce 10' above the ground. It paralleled the limb and tail reflexed over back. Collected this one (820 J.B). The base of this 2½' tree in diameter was covered with a mass of cone scales one foot deep and radiating 12' from base of tree. Several holes were dug at base of tree in scales and this squirrel when shot had attempted to escape down one of these entrances. The scales were mainly spruce. These two sciurus were two blocks from savannah on the west and one block from edge of aspens & spruce ~~and~~ to the east
12:04 Eutamias ran into hole.
12:12 Collected (821 J.B) immature Sciurus running across ground among a group of Spruce tree in aspen-spruce fir forest. 8 or 9 spruce had spruce cone scales at their base in this group of trees. This squirrel did not call. While all other Sciurus collected on this trip were Sciurus fremonti this one possessed the typical ventorum characteristic in having yellow hair tips in tail.
12:20 Likely Sciurus home.
12:31 Juncos & Chickadee
12:32 Likely Sciurus home with nest in tree.
12:36 Gray headed juncos feed young about same size as parent.
12:40 Sciurus chattering at 200' intermittently with a different call, sounding more like a woodpecker. Approached area and it ceased calling. Sat down to wait for it to resume its calling but did not make itself known again. These Sciurus have a habit of calling when they sense danger and when approached stop their chatter and either lay flat on the bows or cling on to limb with tail over back. There they remain motionless until one leaves and when out of sete commence their chattering again. To return to the same mammal, one would receive the same response again.

12:54 Drag in pond south of Coral at woodedge
12:57 Juncos feeding young.
12:58 Chipping Sparrow calling as if it had youngones near.
12:59 Collected (824 J.B) Dryobates pubescens leucurus feeding in top of dead Englemanns Spruce between Cyclone lake and Coral pond.
1:12 Arrived at north end of Cyclone Lake. From here plan to enter the forest grankle of spruce, aspen and fir on east side of lake and following south to south end of lake. This will give me the two habitats of the Sciurus, both identical except in this case will have the association of the lake.
1:25 Collected Sciurus fremonti (822 J.B) east of lake. 2 blocks up side hill among the forest trees. Saw it first leave base of tree and run up trunk 20' and then cross limb to dead spruce standing by. It took refuge on the opposite side of this tree and remained motionless on one of the dead limbs. At the base of the Spruce tree was a mass of Spruce cone scales 2 0' in diameter. On several of the rocks and logs 100' away were found the scales of spruce cones. This tree was the among a group of spruce on this mixed aspen - spruce - fir forest. One can tell whether the any particular spot is being inhabited by the accumulation of spruce cone scales at base of tree and if it is the home tree a nest will be found either in the branches of the tree or in secondary tree found closely associated with the cone scale littered tree. The nest is either placed on outer branches or hugging the main trunk and placed from 15' to 40' high. Generally at the base of the nesting tree we will find that the mass of scales are perforated with holes.
1:26 Jumped two deer, one a buck at 40' in aspen & spruce 1½ block east of lake on hillside. They appeared very yellow in color.
1:27 Likely Sciurus home.
1:29. Sciurus home with two nests with spruce cone scales at base. At this spot left the Sciurus that had been collected this morning on log 150' from nest and returned to likely sciurus home where animal had commenced calling (site at 1:27). Had'nt gone 500' until I heard a vigorous chatter at point where I had left specimens on log so returned to find that a Sciurus was very concerned about them, calling from the trunk of a tree 12' feet above them. Got there just in time to see this chattering squirrel jump down to log where specimens were lying. As soon as he saw what they were he jumped onto, the log like a scared cat and ran to opposite end of log where he was collected. (823 J.B). In this case and the last home of the Sciurus.

that I had just previously visited the squirrels were not in evidence nor did the call previously to my arrival, but after leaving their environs commenced to call.

1:50. Examined another Sciurus home but no squirrel in evidence. Dropped down to lake at mid section.

A ♀ mallard left shore with 4 young about 5 days old. Four other adult mallards left east shoreline and flew across lake. 2 chipping Sparrow called locust-like among the willows on the east side of lake.

2:10. Arrived at south end of lake. While walking on the lava boulders running out into lake picked up several Pseudacris tuscensata on the damp ground near water edge. The water is now 20' from the willow growth on east side which probably represents the high or normal water level of the lake. The forest of aspen - spruce & fir on east side of lake would be an exceptionally fine area to make a selective study of the Sciurus. at least one could keep a yearly check on numbers on a certain known plot. say the length of the lake and include all area on a 300' strip of the adjacent hillside bordering lake. In this manner one could check on fluctuation of numbers and period cycles. At present there appears to me to be an overpopulation per unit of these squirrels. Left this temporary Station 7, at Cyclone Lake at 2:30 with mileage reading at south end of lake. at 42.5. At mileage reading 45.7 can see distant country to the far south. Arrived at Camp 46.9. By the time I had prepared these Sciurus collected this morning was time to set up. trap line. Set tonight beyond the S.W corner of the Posey lake ground enclosure among the aspen - oak and Ponderosa pines.

* Station 6 - 7/2/38 Posy Lake.

Temperature at sun up = 47°F

Trap line returns. Set in line through oak and ponderosa pines.

1. Unaffected. Base of ponderosa pine.
2. " " " "
3. (825 J.B) Eutamias adsitus Edge of andesite boulder among Ponderosa - oak association.
4. Unaffected. Along forest trail through oak.
6 " " " " "
7 " along side of burnt log on hillside.
8. (828 J.B) Eutamias. Stud.
9. (826 J.B) Eutamias. By side of lava boulder in opening among Ponderosa stand.
11. Unaffected. Base of burnt log.
13. " Base of Ponderosa pine.
14 Sprung. Bait gone. Base of Ponderosa pine.
15 Unaffected. Edge of rock in Ponderosa stand near oak.
16. Sprung " " " " " "

The Indians gave him the nickname of Posy, that is associated now with Posy lake and Posy Creek. Fay possesses considerable knowledge concerning the hunting and movements of the Piutes and Navaho of years ago when they came up from low country to hunt on the aquarius. He feels that the Indian people that inhabited the moki houses were a small group of people and left the country and migrated to mexico and south America.

Birds seen at lake:

W. Wood Pewee
Robins. and four young robins as large as adult but unable to fly so good.
Spotted Sandpiper.
Mallard Duck with 8 or 9 six day old young
American Coot
Swallows (sp.)
House Wren
Cinnamon teal ? Identified by egg only although George reports seeing a small duck.

Since our visit to this lake two years ago, [illegible] has taken on many noticeable and shameful artificialities. The waters have been impounded and now the lake is several feet higher and covers the original lake shore edge. As a result of this new water level many of the Spruce have died that were bordering natural lake shore line but now inundated ~~our~~ leaving roots in superbsaturated soils. The beautiful example of a natural fill in at north end of lake where the numerous young spruce had been invadeding as new alluvium was formed, has no more signficience. When one views a lake he is interested in the present cycle that the lake may be passing through. and not an artificial fish pond that is man controlled and has no relationship to the sequence and changes occurring on the drainage system. Beside a replacement of the old bordering vegetation along the lake, the plant growth within the waters are due for a change. Even now, both no outlet, the plant life is being effected by insufficient circulation and, a ~~but~~ life sapping mass or algea that is covering every living plant submerged below the water levels. Just another case of a wonderful natural body of water being sacrificed in the interest of the general mass of people who has not yet been educated to appreciate natural and primitive surraundings. Left Posy lake Station and headed for the mouth of Calf Creek on the Escalante River. Stopped at C.C.C Camp and met T. L. Johnson, chief mechanic who lives at 110 N. 5th east at Provo. With Mr. Neville, the superintendant of the Camp, renewed

our aquantence of two years ago. while conducting a biological survey in same area. Mileage at Aspen Grove C.C.C Camp 48:2.

49.0 Joining main road.

50.0 Leaving Ponderosa Pine and dropping into juniper and pinyon belt.

From a point where the 'Box' enters the canyon can see a beautiful example of a monocline, taking on the appearance of an overturn fold. Many box canyons enter from the west face of this structure. A short ride down canyon and one can see where the Escalante rover cut through the monocline structure with high confining walls on either side.

63.5 Arived at Escalante and after representing left for our desert station. From Escalante our route carries us through a relatively flat country, at least in comparison with the country we have been traversing the last 3 weeks. This desert like valley decidely limited on the west by the indecisible Straight cliffs and to the east by highly erasional canyons of the Escalante River and drainage. Being a clear day we cauld see the laccolithic dome of the Navaho mt. to the south at the southern terminal of the Straight cliffs. While this dome appears to be connected with the Straight cliffs is actually intercepted by the profound Chasm of the Colorado River. At apactly 7 miles from Escalante we come to the turn off leading down towards the Navaho mountains. The car almost dissaled from the main road by force of habit, for two years ago we spent nearly a month down this desert. Turning east at this point travelled directly to the east to the edge of the Escalante escarpment. Beyand, to the east in a panoramic view beheld a view that firmly brought out the fact that the erosional powers are responsible for greater accomplishments than one generally credit them for. With the benefits of the last three weeks contact with geological structure and this climat before us. the magnitude of the erosinal powers of water gradually takes form in our way of dealing with and thinking about geological history. Was quite a sensation for a moment to think we were going to conduct a biological survey in the very heart of the dismal and god. forsaken bad land whose distant enchantment had thrilled us from our stations upon the Aquarius. Traveling over bare rock (100%) in many places + finally reached the edge of a high walled canyon with the Escalante river occupying a small percentage of the river floor proper. many hundreds of feet directly below. at this vantage point the C.C.C fellows had constructed

18. Uneffected. Base of Ponderosa Pine.
22. " " " "
23 (827 J.B) By side of rock by Ponderosa tree.

All traps on a linear line 80' long on hillside with Ponderosa pine approximately 40' apart. Boulder scattered about and 70' soil. Pine needles covered ground with oak patches at edge of stand. Have noticed on several occasions that the aspen trees and oak do not enter the Ponderosa pine but abut up to edge of stand only. Ponderosa groves are generally found as pure stands. Back to camp and set up for skinning. Western Evening Grosbeak flew by calling at Posey lake Camp at 8:40 A.M.

(827 J.B) Peromyscus. Skull fractured & destroyed.
Length 155 m.m.
Tail 69 m.m. adult ♂
Foot 19.5 m.m.
gr. wt 22

(828 J.B) Peromyscus. Skull only.
Length 148 m.m.
Tail 65 m.m. ♂
Foot 20 m.m.
gr. wt 16 testis 7. m.m.

(826 J.B) Peromyscus. Skull only.
Length 162 m.m.
Tail 73 m.m. ♂
Foot 19.5 m.m.
gr. wt 25 testis 10 m.m.

(825 J.B) Eutamias adsitus. Embryos just forming.
(829 J.B) Wilmer collected Utah Jay at Posey Lake on west hillside, 50' from lake shore on aspens. When first seen flew from lake shore into aspen trees. Testis measured 5 m.m.

Wilmer Tanner collected a Sciurus fremontii at the N. West end of lake and he prepared it for his collection of mammal at Provo. High School. His collection number for this mammal is 96 W.T. measured:
Length 345 m.m.
Tail 134 m.m adult ♂
Foot 51 m.m
wt. gr. 24.5

Jay Porter of Escalante and mayor Selow dropped into camp. Mr Porter is the son of the man from which Posey lake has received its name. Mr. Andrews Porter (father of Jay) ranched this area at one time and during the times he spent along the Colorado river he made many contacts with the Indians.

380702-221

an observation point in connection with the new Escalante to Boulder road. From this point the entire country assumes a similar topographical expression as is exemplified in this section of the panorama of Calf Creek. Calf Creek canyon in this slot is rather deceptive in that the elevated canyon floor pretends to be the valley floor. However the present narrow canyon has eroded down below this upper ancient level and enters the Escalante Canyon at the rivers grade.



1-7-2-38

A considerable percentage of the surface exposure is bare rock with the sparse vegetation being confined to the mesa tops, the elevated floor level and on other flat benches. Even the present canyon floor of the Escalante has very little growth. evidently. The canyon of Calf Creek however has received a more constant supply of water for ~~along~~ its bank ~~is~~ lined with beautiful buck and willow. Most of the trapping was confined to canyon floor and side wall up to and including the elevated ancient flood level. It is upon this elevated floor level that the wind has a chance to play upon the sands, being more open than either lower floor level or interupted benches above. The sand dunes formed by the wind action is the favorite habitat of the Lepadomys. Bowns Point on the Aquarius can be seen in the distance from this point. From here we merely had to drop down to the river edge below where we made our final station no. 8. Arrived at mouth of Calf Creek with mileage 80.3 made camp about 3 block down river from mouth of Calf Creek. Set traps tonight on south side of canyon from the river bottom up canyon wall to top of elevated valley floor. This evening talked with C.C.C fellow who had stubb camp establish near. They report seeing several rattlesnakes, mainly around their camp at mouth of Calf Creek.. Very amusing to talk to, being all from Georgia, Florida and Louisiana and possessing an interesting manners of expressions such as 'you all', 'great gee', 'we all reckon so', 'over at yonder canyon', etc. Their gophers are tortoises and salamander are gophers. After their visit we retired, sleeping in a new environment but still under the same blanket of Celestial stars.

* Station no. 8. 7/3/38 Mouth Calf Creek.
Up at on trap line before sun had a chance to effect mammal.



First series of trap set on sandy dunes bordering river and supporting Artemesia from 4' to 7' high and nice patches of Squaw bush. Two large cattonwood trees growing near. A few oak grew in the less sandy elpasures.

1. (830 J.B) Dipodomys ordii cupidinus. At entrance to hole on edge of cut through sand dune.
2. (831 J.B) Peromyscus. Set for Dipodomys on sand dune covered with Artemesia.
3. Unaffected. Sand situation.
4. "
6. (832 J.B) Dipodomys ordii cupidinus. On sandy area 200' from river.
7. Unaffected. For Dipodomys.
8. (833 J.B) Onychomys l. melanophrys. Caught in large mammal hole like Badger in sandy flat associated with Squaw bush, Artemesia, cattonwood & oak. 200' from river and bordering Canyon walls. Two other peromyscus were taken from same hole late last night, one being (835 J.B) Peromyscus. m. s and the other (834 J B) Peromyscus truei. The truei was taken first last night,
9. (836 J.B) Peromyscus. On river edge under water cut ledge
10. (837 J.B) Peromyscus. Ibid.
11. (838 J.B) Peromyscus. Among ledges on canyon wall
14 (839 J.B) Peromyscus Among ledges on canyon wall and associated with Neotoma homes.
18. (840 J.B) Peromyscus. Ibid. Same series of ledges.
22. (841 J.B) Peromyscus truei. Ibid.
23. (842 J.B) " " In ledges on canyon wall. Overhanging and protected from sun or rain, and in associatcon with Neotoma.
5 (842 J B) Peromyscus truei. Ibid.
12. (844 J.B) Peromyscus. Ibid. All cliffs about 300' from water and 150' above flan level. on south side of canyon.
8 (845 J.B) Dipodomys ordii cupidinus Sandy flat bordering
11. (846 J.B) " " " river at camp.

Returned to camp under cattonwoods and prepared material before the sun and heat would effect the skins. Started in open but soon moved into tent because of the peradic winds that caused us to chase all light equipment that was not heavily weighted down. Winds generally from the east.

832 J.B 380703-223 Dipodomys o. cupidinus. Immature ♂ destroyed
length 222 m.m.
tail 130 m.m. ♂
foot 38 m.m
gr. wt. 38

845 J.B Dipodomys o cupidinus Destroyed.
length 220 m.m.
tail 125 m.m ♂
foot 39 m.m
gr. wt. 31

835 J.B Peromyscus. Destroyed.
length 151 m.m
tail 72.5 m.m
foot 20.5 m.m
gr. wt.

831 J.B Peromyscus. Skull only.
length 144 m.m
tail 68 m.m ♂
foot 19.5 m.m
gr. wt. 17

839 J.B Peromyscus. Skull only.
length 152 m.m.
tail 68 m.m. ♂
foot 20 m.m.
gr. wt 15 ~~m.m~~.

840 J.B Peromyscus. Skull only
length 157 m.m.
tail 73 m.m. ♂
foot 20 m.m
gr. wt. 13 m.m

844 J.B Peromyscus. Destroyed
length 137 m.m.
tail 63 m.m. ♂
foot 20 m.m.
gr. wt. 9

830 J.B Dipodomys. o.c. Testis 12 m.m.
846 J.B " " " Uterus normal.
843 J.B Peromyscus truei. 4 embryos 8 m.m long.
842 J.B " " Testis 12 m.m
841 J.B " " Uterus normal.
836 J.B Peromyscus. Testis 5 m.m.
834 J.B Peromyscus truei " 5 m.m.
833 J.B Onychomys. l. melanophrys. Testis 9 m.m.

(847 J.B) Peromyscus. Caught under log near river in middle of day. Skull only

length 139 m.m
tail 64 m.m ♂
foot 20 m.m.
gr. sot 15

* Station 8 - 7/4/38 mouth Calf Creek. Last nite set entire battery of traps on sandy platform above camp on south side of canyon. This area is the old elevated flood level and lies S.E of the mouth of Calf Creek. Comprises an area of about sq. miles and consists of a gently sloping series of sandy knolls and moving sand dunes. The main road crosses a portion of this sandy bench just before it descends into the canyon proper. The dominant vegetation is Ephedra which covers many areas of the bench either as small patches of 3 feet high plants or growing like Grasses without bunching together. Curly grass mats certain areas and assists in holding back the moving sands. Juniper and pinyon border the area with the Escalante Canyon to the north and east and towering pinnacles to the south. All traps were set in holes in sand. There appeared to me to be an unusually great number of Dipodomy holes on the sides of the Ephedra mounds and other elevated areas.

Trap returns.

1. Sprung. In above area.
2. Sprung Ibid
3. Unmolested Ibid
4 " "
5 Sprung "
6. Sprung. An owl or hawk ad visited this trap and had left several feathers and feet marks.
7. Dipodomy tail only.
16. Unmolested
17 "
18 "
22 Dipodomy tail only. Something had eaten the animal and left the tail and lots of hair near trap
23 Dipodomy tail only.
1. Sprung
2. Unmolested.
3. Sprung
4. Unmolested
5 "
6 (867) Peromyscus. In hole set for Dipodomys.
8. Sprung
9. Unmolested
10. Sprung.

380704 225

11. Unaffected.
12 Sprung
15 "
14 Unaffected
16 Sprung
17 Unaffected
17 (862 J.B) Peromyscus. Caught near camp in Badger hole or some large annual hole. Some burrows as the Euchoreps was taken from last nite.

(863 J.B) Peromyscus Ibid and before trail was taken.

(864 J.B) Peromyscus. at edge of flat flats level against

(865 J.B) base of cliffs. Damp meadow abutted against rocks.
Peromyscus. Ibid

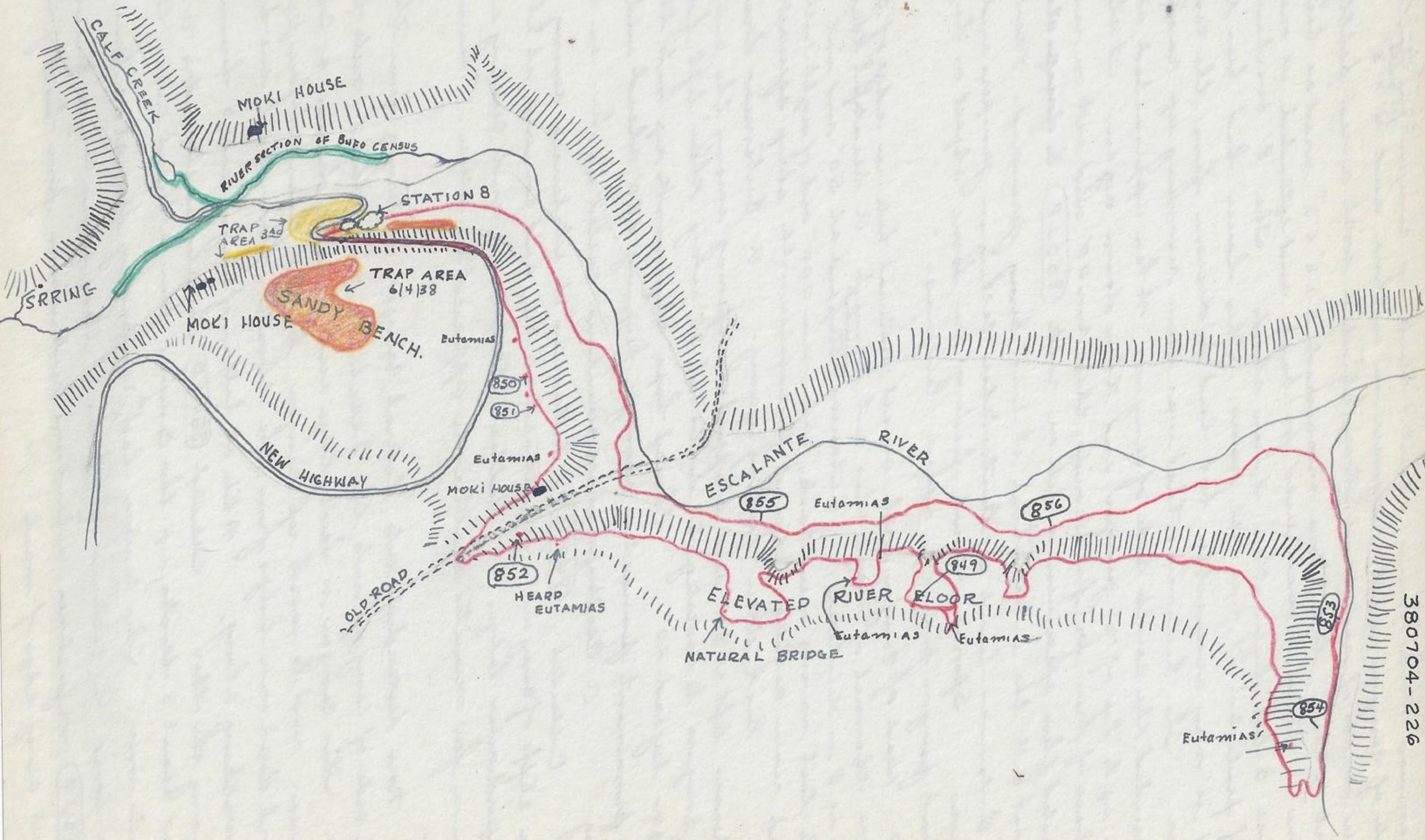
(866 J.B) Peromyscus Ibid.

(857 J.B) Peromyscus Ibid.

(859 J.B) Peromyscus Ibid

(860 J.B) Peromyscus Ibid.

Placed these mammals, after returning from trap line, in home made cooler while George & I spent the morning collecting down the river. Left at 8:00 A.M. and followed main road to top of elevated flat valley and hence along the edge of the canyon walls.
8:35 A.M. At small lateral heard Eutamias in top of dead limb of pinyon: Says Phoebe near. Two hundred feet from first Eutamias seen heard I seen second one. It was on top of a 4' high Ephedra at edge of cliff. River bottom 200 feet below. As I approached it left Ephedra and ran into hole 10' away at brink of cliff under the protection of a winter fat bush. The numerous and well packed trails indicated that we had found the home of the Hopi Chipmunk. Remained here for several minutes but it did not return, but just as we were leaving another Hopi was seen running along edge of cliff in direction of hole we were watching at present. Collected this one (850 J.B). It was eating juniper seeds. About 100' from this home collected a E. dorsalis utahensis (851 J.B). It was heard calling from tree and while running across sands at edge of cliffs collected it. It ran into crack among cliffs and had to be fished out. The four above Eutamias were all seen within 200' of each other and did not act as wild as those found at Moki Tanks in the Circle cliffs. At the point of cliffs at mouth of old road canyon saw another Hopi at edge of canyon wall. Just ran into it at 30'. It ran 50' to opposite side of boulder and stopped for few minutes then ran along canyon wall. From this point could see another Eutamias running up road far below in this lateral canyon.


CALF CREEK
MOKI HOUSE
RIVER SECTION OF BUFO CENSUS
STATION 8
TRAP AREA 3&4
TRAP AREA 6/4/38
SANDY BENCH.
SPRING
MOKI HOUSE
Eutamias
850
851
Eutamias
NEW HIGHWAY
MOKI HOUSE
ESCALANTE RIVER
855
Eutamias
856
OLD ROAD
852
HEARD
EUTAMIAS
ELEVATED RIVER FLOOR
849
Eutamias
Eutamias
NATURAL BRIDGE
853
854
Eutamias

380704-226

380164-221

Examined Maki House about 1 block up canyon. 75' north, side of canyon wall. Square in outline and 4' x 3'. Side walls of red sand stone, chinked with a red pebbly dirt or clay. One stone measured 3' x 6" x 8" used as basement stone. Natural wall used for back and extended at one time 2 feet higher than it now stands. The 8' overhanging cliff protected it from all rains. This house had been raped and is very accessible but hard to descern from the canyon floor. The Eutamias that was seen running up road, now ascended the south side of canyon. When approached at 80' ran up to top of 12' juniper and then down again. It stopped at base of tree for few seconds then ran 20' and sat on rock. Collected this specimen while on rock (852 J.B) E. dorsalis utahensis Did not call the entire time it was being persuded.. Near this Eutamias heard a Gnatcatcher calling in junipers and pinyons. Sparrow hawk feeding on some object on top of dead pinyon pine. Heard Eutamias -

11:00 Head of canyon with small natural lake in edge of cliff where channel of wash has cut through. A beautiful example and is 3' in diameter. Eutamias hopping stopped at 50' and sat with tail waving over back, then ran 200' out of sight, calling. Heard raven calling. Heard flycatcher with sharp squeeky-like call. Rock chen feeding young. A Eutamias dorsalis utahensis left at 30' and stopped in opening among the junipers and pinyons to investigate soils at 35' away. then left for juniper beyond. 20' Chased Hopi chipmunk up into the high prominent pinnacles always keeping 150' ahead and calling. A Psaltriparus m plumbeus called in tree on hill side! Collected. (849 J.B) Eutamias d. utahensis among the higher cliffs of canyon. Frightened at 30' and cornered it at base of perpendicular ledge. Redtail screaming and circling above and in a few minutes another one appeared on scene. Same finch

11:45 Now descending into lateral canyon entering from the south side of Canyon into the Escalante river about 1 mile below camp. This canyon is fairly large and probably drains a considerable area. Had to work up canyon to this point before permitted to work down over ledges from the elevated floor level we had been walking along. While at bottom of canyon saw 2 hummers, one chasing the other. Collected (854 J.B) Archilochus alexandri (?) here at about 3 blocks up this canyon from where it enters the Escalante river. This canyon had a ramposing flow at one time. and is board by cottonwood trees. Along same canyon collected a (853 J.B) Myiarchus richardsoni richardsoni from his dry limb centered along edge of wash.

Other birds observed in this lateral canyon: 380704-228

Ant Woodhouse Jays
4 mourning Dove
2 quail
yellow warbler
one Catelbus g. grammicus.

On return trip in main canyon along river course collected
(856 J.B) a Woodpecker feeding and calling in Populus fremonti.
Trees limited in river valley but pinyon & juniper on adjacent
side hills.
(855 J.B) Warbler feeding in Squaw bush. These bushes and
accompanying Populus were limited and were confined to edge
of valley at base of canyon wall. Another bird of the same
size was found on the small area of tree & brush growth.
Returned to camp and prepared specimens.

(857 J.B) Peromyscus

length	159 m.m.	
tail	67	♂ m.m.
foot	20	m.m.
gr. wt	23	

(859 J.B) Peromyscus.

length	157 m.m.	
tail	68 m.m	
foot	20 m.m	♀
gr. wt	19 m.m	

(860 J.B) Peromyscus

length	153 m.m	
tail	60 m.m	♂
foot	20 m.m	
gr. wt	19 m.m	

(862 J.B) Peromyscus

length	152 m.m	
tail	78 m.m.	♀
foot	21 m.m	
gr. wt	10 m.m	

(863 J.B) Peromyscus

length	156 m.m	
tail	70 m.m	♂
foot	19 m.m	
gr. wt	20 m.m	

(864 J.B) Peromyscus.

length	150 m.m.	
tail	62 m.m.	♀
foot	20 m.m.	
gr. wt	16	

380704-229

865 J.B Peromyscus

length 150 m.m
tail 68 m.m ♀
foot 20 m.m
gr. wt 15

866 J.B Peromyscus.

length 148 m.m
tail 64 m.m. ♀
foot 20 m.m,
gr wt 16

867 J.B Peromyscus

length 165 m.m. ♂
tail 72 m.m
foot 20 m.m
gr. wt 19.5

856 J.B Woodpecker

length 225 m.m
Wing 120 m.m
Tail 86 m.m ♂
Tarsus 25 m.m
Toe 15 m.m
Bill 31.5 m.m
Testis 2 m.m

Did not set traps tonight because George, Wilmer and I planned on spending tomorrow morning up Calf Creek and we were to leave our station on the Escalante River for Bryce Canyon that afternoon. So carefully packing the traps for the final time on our 1938 biological survey spent the remaining evening near Camp. Last night we were in the field from 9:15 to 10:15 in determining the percent frequency of the Toads along the river course. Covered the creek and river edge from a point north of camp up to and including the temporary pond at C.C.C Stub camp, hence up river and then returned to original starting point. George and I followed Beck & Tanner along certain section of river and found that they had not missed any toads and so returns are 100% indicative of the numbers represented along this selected area. The route covered is about 4 tenths of a mile and disclosed:

93 Bufo woodhousii ranging from 1" to 2½" in length & about 1/3 percent adults.
3 Scaphiopus hammondii, all adults.
14 Bufo punctatus, 12 adults, 2 juveniles.
110 total.

Practically all toads were taken from water edge, in the water or only a few feet away. However a few were taken 100' from water.

* Station 8 - 7/5/38 Mouth Calf. Cr. 380705-230

Before leaving on our Calf Creek water falls trip snapped a typical view from our camp along the Escalante river. Such pinnacles dominate the more eroded upper levels above the elevated floor of ancient valley, while below the level of of this bench line the canyon walls assume a more shear aspect and lack the intrusic dissection of the ~~badaed topography~~ above.



1-7-5-38

This elevated floor level intercept the middle portion of the picture and is particularly well represented on the left hand side of the picture. Our skinning tent and table was situated at the identical spot from where this picture was taken.

Dr. Beck drove us up the new road that was being constructed in Calf Creek for about 8 blocks from mouth of Canyon. at this point the C.C.C fellows effect to take the road up the east side of canyon. As to just how this feat will be accomplished I'm sure I do not know. Left car at 8:15 A.M.

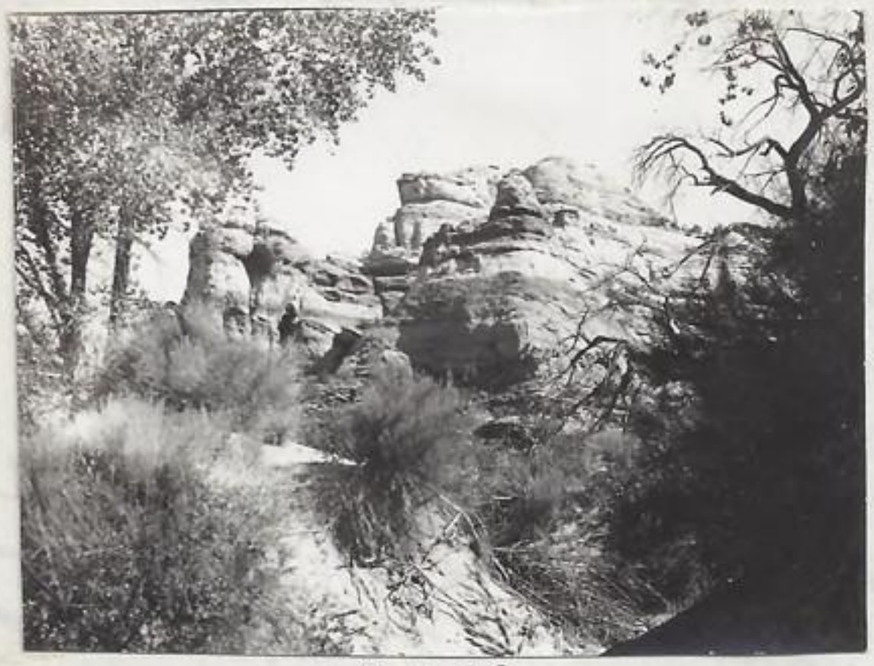
8:20 Heard two Spurred Towhee singing.

8:30 Deer flies present and annoying while at our station on the Escalante River we found them not represented. This Canyon supports considerable more vegetation and true life than found in any other canyon in this area. The willow, birch, squaw bush, chrysothamnus, artemesia border the creek and bottom of canyon while the Juniper and pinyon carry upward among the canyond sides in their normal manner. The grade of the stream bed is very interesting It follows along at the same degree of dip as the strata of the formations. By following these bedding planes the creek appears without cascades and few rough water drops that are normally found associated with canyons of this age. It is really a pleasure to wade up this canyon stream bed, for one only draws an inch or two of water at at the same time has a smooth, solid surface to walk upon. The only way to travel up this canyon is by this water route because it elimnates the tiring work of climbing up and down over the irregularites of the canyon floor and treading through the sands and vegetation growth. The water route does away with the reflection of the hot sands and at the same time keeps the feet at a more normal temperature.

8:40 Have seen several small seeps along the creek bank.



8:42 Citellus g. grammurus. on ledges above stream.
8:45 Eutamias on rocks above stream.
8:55 Eutamias. 4' from edge of water. A myiarchus. C. cinerascens called along creek edge. Black headed Grosbeak ♂. N. W. P Pewee calling. Purple finch. 9:10. A.M. Snapped picture showing Cottonwoods, Artemisia Chrysothamnus, and the sandy nature of the soil. Typical erosional knolls like these represented here are found on other side of the canyon but are replaced by a more perpendicular walled canyon farther up canyon.

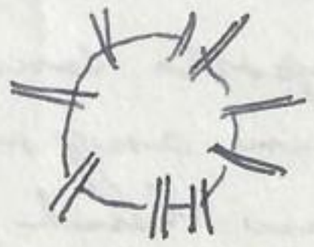


2-7-5-38

9:20 Spurred Towhee singing Swallows (Sp ?) flying up & down canyon. Spurred Towhee singing
9:25. Spurred Towhee singing.
9:30 Robin
9:35 Rock Wren. Spurred Towhee calling. at the first amphitheatre on east side of canyon examined a remnant of a Moki House. Besides the base of a house found a cyst. It had evidently been covered with a roof of sticks which had caved in and now the ends of the supporting beams were upright. The individual supports were burnt, and were protruding from the floor of the cave and about 10' from cave house. This cave is on south side of amphitheatre nearer the river than back of circular enclosure. Did not attempt to excavate and did not disturb in the least. Sp. Towhee singing. Says Roche. Calling.



Profile



Floor Plan.

10:00 A.M. Now at point in canyon where a perpendicular black water streak marks the back of the amphitheatre. while on west side of canyon near top of cliff is a beautiful circular fracture pattern. Floor of valley here completely covered with a new 8' soil growth.
10:05 R.S. Flicker. The tadpoles are numerous and found in varied situations, mainly in isolated side pools and slow running water, ranging from 1/4 inch to toads without tail and passing legs. Bufo woodhousii in adult stage were seen at several places. Says Roche resting on outer dead limb of cottonwood
10:15 Cabin feeding in water from one rock to the other.
10:16 B. Headed Grosbeak. Purple finch, coyote tracks, deer tracks along creek sands. The coyote had followed along the water edge for several hundred feet and left nice tracks.



10:25 Large amphitheatre on left side of canyon leading back for some distance. Two swifts were seen flying along walls. Counted 2,000 tadpoles in pond 10 x 3 from 1/4" to 2 1/2" in length. This pool had connection with main creek.
5 Spurred Towhees singing. Minnows associated with tadpoles. White breasted Woodpecker calling vigorously. 8 swifts flying along walls of canyon and calling vigorously. They would stop momentarily at certain spots on the side of these perpendicular cliff to inspect. Fanned this section of canyon for a few minutes then left the area. Minnows very frequently were seen in creek ranging from 3 1/2" to pinheads, about the size of mosquitoes larvae. The size increasing as we worked up stream. Yellow warbler.
2 Say Phoebe. one calling like Eutamias or Rock squirrel.
Approximately 4 1/2 miles long.
10:50 Bofelder trees increasing and forming beautiful groves.
V. V. green (?) swallow increasing in numbers
10:52 Second left hand fork with water issuing from stream channel. Mourning dove.
11:00 Spring issuing from east side of canyon. being the largest observed so far. From this spring reversed direction and took picture looking down canyon. Here the canyon is seen in all proportions of Zions Natl Park. The towering wall are pressing and confine all vegetation to the floor of the canyon proper. The walls have been increasing in heighth for the last mile or so and am not surprised the the falls may be just around the next corner.



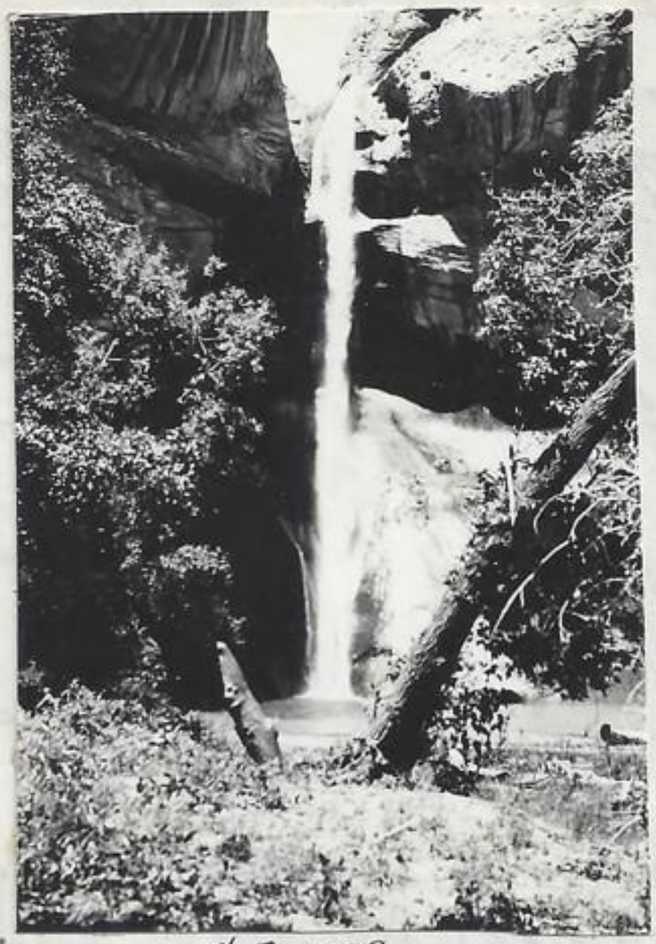
3-7-5-38

The cottonwood, bofelder, oak birch are the dominant tree and are limited to the conyon floor not being occupied by the main stream. The large spring visited at 11:00 is about 30' to the left of the scene this shot was taken.
11:05 Two Say Phoebe feeding out from limbs of dead cotton-wood tree. Cabin. Song Sparrows feeding young about same size as adult bird.
11:09. Can hear falls roaring in distance. After rounding next left turn bend can see them in full view. A marvelous sight to behold and one would never dream of finding such a site as this in such a country for one is generally used to associating them with a more mountainous situation with dense vegetation on all side.



380705-233

The canyon with its majestic confining walls ends abruptly in an amphitheatre with this falls plunging down from the rim of the canyon above. As is frequently the case with falls associated with a horizontal reposed series of strata an amphitheatre is formed at the head of the canyon by the action of the plunging pool formed at the base of the falls and by the weathering of the side walls above. Many falls, that move progressively up a canyon have a horizontal resistant strata at top but not in this case for a channel is already established at the top of the falls. No one knows exactly how erosion action progresses in this sandstone country and this falls certainly presents no normal or ordinary problem. Fifty percent of the charm of this falls is the plunge pool below. It is 125' wide and lined with a semi-circular sand beach of rare symetry. To see this fall plunge out over the upper ledge and down into its self made groove in the sandstone at base of pool should be preserved by all means with the observation points located in such a way as to allow views of its varied aspects but not allow encroachment upon the shore lines of the pool or contigent areas. A vantage point could be establish at the rim of the canyon where all possibilities of destruction could be eliminated. Would estimate that the entire heighth of falls would be close to 170'. Associated with this fall amphitheatre are monks Hood and Columbine found in the moist situation under protection of overhanging walls where water is continually dropping from the fissure above, and bench, bakelder and oak on side of canyon floor below falls. Would expect to find an abnormal congestion of mimmus



4-7-5-38



5-7-5-38



380705-234

at the head of creek at this barrier but appeared to be represent in usual numbers, however they larger fish were here. The plunge pool where effected by direct impact of falls is probably 9 feet deep. This barrier should present some very significant studies in distribution particularly with the aquatic forms. The garter snake was taken here.

Left falls at 1:50 on return trip.

Woodhouse Jay..

Sucker 5 1/2" long, Cyprinids numerous.

Sparrow hawk.

3 Woodhouse Jays, Monarch butterfly.

1st fork on west side of canyon at 2:10.

2:12. Black Swallow-tail.

Jays Phoebe calling like Eastamias.

Towhees still singing.

Eastamias. A white throated swift flew down to water in creek and took a drink.

Eastamias calling: The masses covering bottom of stream bed on smooth rock surface are black in a dendritic form, and yellow mass on faster flowing slopes and on edges of small cascades. Wherever the water becomes aerated in cascades is found a moss growth below.

3:00 Adult Woodhousii brake through sand at creek edge. and loped away.

♂ & ♀ Wood Pewee fed young. Mourning dove.

3:04. Located high situated moki House on east side of canyon about ¼ 2 blocks down canyon from last amphitheatre. It is just over top of high cliffs and on attempting to gain its position found that it would be necessary to approach from the top. Protected from above and appeared as if it were recently made. It seals in a irregularity at back of the protected recess or cave like formation. Made of oblong rocks with dark reddish maroon plaster. Plaster used in some manner as today with rock surfaces exposed. Door ⬡ this shape and is in place with sticks still propping it up. Located also a camp site 50' above lateral canyon on flat point about 50' above creek level. It is situated on the north side of lateral canyon south of the Moki House. During the 1/2 hr stop at this camp site collected a representative series of pot sherds, points, cup shaped concretions & round white rocks. The area represents a 11' diameter of charred soils six inches deep. Several larger stone found associated with it.

380705-235

4:23 Mouth of Calf Creek.
On arrival of camp. Dr Beck reports seeing the Spotted Sandpiper, Quale and bluebird in Calf Creek yesterday. Camp had already been dissembled and without ceremony left our Station with Bryce Canyon as our destination tonite.
Left at 19.0 mileage at 5:35 P.M.
21.2 Artemesia, juniper, matchweed and pinyon dominating. Good sanddunes supporting Depadonny holes near road.
04.0. Fair view of Henrys, Aquarius, Circle Cliff area as well as Escalante drainage.
26.5 Travelling 45 miles per hour. match weed and juniper dominating the relatively flat country. Match weed and curly grabs growing between junipers. The match weed in open fields particularly.
29.0 Cottontail & Jack patterned on road. Travelling right along at 50 per.
34.9. Arrived at Escalante at 6:18. and after short stop pressed on toward Hindstae via potatae valley and Birch Creek.
42.5 Ponderosa pine in evidence. The junipers and pinyon have much ranker growth here than in low devil country where we had just come from. Few cottonwoods in creek bed. Water in gulch.
47.2 Cottonwoods more numerous Have passed several bluebirds, Sat on one flock.
51.0 Aspen & fir.
Yellow patch.
Yucca (narrow leaf) 51.9.
62.0 Manzanita prominent. Oak associated with Ponderosa pine.
63.0 Symphoricarpus, lupine
54.5 Losing almost all Ponderosa pine with fir, Spruce, aspen manzanita and Siberian juniper replacing.
56.6 Divide at 7.25 P.M. few ponderosa on top. Drove over to spring and back on divide at 55.8 again.
57.0 Pork tail pine.
58.0 Mixed forest of fir & spruce dominant.
58.2 Siberian juniper.
60.0 Jack rabbit ran across road. The Chrysothamnus completely filled valley which is good indication of overgrazing at one time. Did not find as many Ponderosa on this side as on Birch Creek or other side of divide

about 64.5 at Kidatae. From here just a short ride to Bryce. Camped here tonite. M. Cape superintendant

* 7/6/38. Left Bryce Canyon this morning, hence to Zion. met Mr. Walker at the Museum who possesses a very pleasing personality and well versed in his field. Showed us a Diadophis regalis regalis he had collect on trail and reports several other specimens have been taken. Left Zion, hence to St. George for a day and a half.

* 7/7/38 Morning of the 7th. George, Wilmer and myself inspected locality site from where four Leptotyphlops utahensis were collected, two of which are now preserved at the Brigham Young University. These Utah Worm Snakes were accidently discovered by a group of men during the course of their digging and screening of a gravel pit. The excavation is situated on the east side of a linear north-south trending gravel bench, 25' high, flat on top and 45° slope to the east. Associated with this bench are numerous flows of lava that have formed periodically and subsequent to the formation of the bench. These lava flows have issued from the same canyon responsible for the source of the gravel accumulations. The bench has not been directly effected by the fingering lava flows and at present a large artificial reservoir intervenes between bench and nearest lava flow contact. Interspersed among this complex topographical surface is found shifting sands of a light red color. From the pit profile of bench find it to be an aggregation of smooth river worn boulders grading in size from 8 inches in diameter to small pebbles, through to coarse and fine sand. The interstitual spaces among the boulders is a fine dirt and frequent patch of clay. Capping the top and sides is a 9" layer of pure red earth and clay destitute of rocks or foreign bodies. Ten feet below top of bench and exposed on east side of profile is a noticeable purplish red clay that appears to be the original erosional surface previous to the encroachment of the gravel. The entire mass of boulders and dirt is compact and rigid and appears to me to be impenetrable to such a fragile and unadapted creature as the small worm like snake. Suggested to men that possibly these snakes had fallen from above

and had come to rest among the loose talus at bottom of pit. The point, however, was made emphatically clear that these snakes were taken intact from the original undisturbed bank. One of the men who had collected the snakes described the actual finding of the specimens." We commenced operation here in the fall of 1937 and while tearing down the back bank of the pit, picked out these two snakes closely associated together. Then again in the spring of 1938 started up work again at this same pit. It had been abandoned shortly after the snakes were found so had remained unchanged since specimens were taken last fall. This spring (1938) in enlarging pit found the second pair on same level but 2 feet beyond abandon wall of old pit. All snakes were found within 4 feet of each other."

At present the pit is 20 times as large as size when specimen were taken and nothing as yet has presented itself. mesquite, fox tail grass and shadescale sparcely cover bench. This pit is situated one block north from a point on the Highway 91 where it crosses first lava flow east of Santa Clara, Washington Co., Utah. These men report that 12 other Leptotyphops utahensis had been unearth in another gravel pit north of the town of Santa Clara. Returned to St. George and packed for trip to Provo.

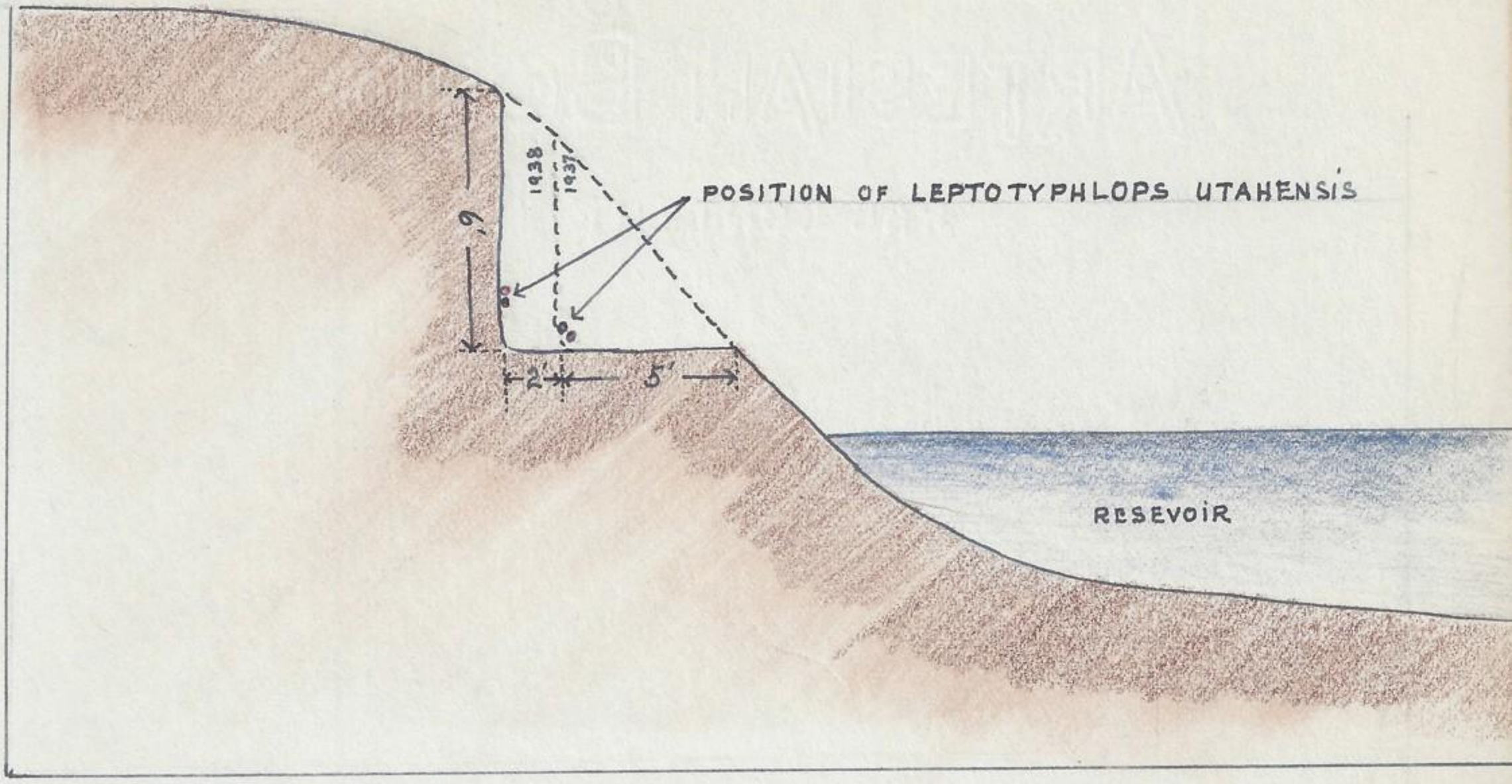
Left St. George and followed Highway 91 into Provo.

Crotalus mollis in evidence 15 miles south of Beaver, Beaver Co. While driving on highway 24 miles south of Beaver, Beaver Co., 6:15 - Temp 87°F passed a Crotalus viridis lutosus. When first seen was coiled with head elevated on gravel shoulder of the oiled road. The barrow pit paralleling road supported running water with sloping shoulder of thistle & other weeds. East of road cultivated with uncut fence line of wheat. Either side of this field is native vegetation of Chrysothamnus and artemisia growing in normal manner. The entire Salt Creek valley is semi-cultivated, the rattler being 2 miles from east hills and six miles to west hills. Numerous Dipodomys talis perforated the broad sagebrush valley. One picked up along side of road. Evidence of Jacks along road.

Thirteen miles north of Beaver saw flock of 16 nighthawks in one close pod. flying about 100' above ground in shade of west hill. The elevation here being 6,700 at 7:30 P.M.

Blue Snake crossed road 4 miles south of Fillmore at 8:30 P.M.

380707-238



GRAVEL PIT ONE BLOCK NORTH OF HIGHWAY 91 WHERE IT CROSSES FIRST LAVA FLOW EAST OF SANTA CLARA, WASHINGTON CO. UTAH. JULY 7, 1938.

SPECIMENS PLACED IN B.Y.U. COLLECTION.

marmota flaviventris engelhardti

780	J.W. Bee	490	145	70	♀	6-24-38		Private Lake

microtis mordax mordax

91	G. Cannon	153	54	20	29 gr.	♀	7-1-38	Posy Lake
92	G. Cannon	175	55	22	46 gr	♂	7-1-38	Posy Lake
47	G. Cannon	148	62	21		♂	7-1-38	Posy Lake
43	G. Cannon	184	56.5	20	50 gr.	♂	7-1-38	Posy Lake
37	G. Cannon	200	51	22	78 gr		6-18-38	Torrey.
762	J.W. Bee	179	44	20.5	57 gr	♂	6-22-38	Steep Cr.
40	G. Cannon	140	51	20	24 gr	♂	7-1-38	Posy Lake
779	J.W. Bee	175	61	20	38 gr.	♀	6-24-38	Private Lake
67	G. Cannon	171	42	17	53 gr	♂	6-22-38	Purity Bog
760	J.W. Bee	157	44	19	47 gr	♀	6-22-38	Steep Cr.
738	J.W. Bee	185	65	20.5	52 gr	♀	6-20-38	Steep. Cr.
65	G. Cannon	161	51	20.5	31.5	♂	6-22-38	Purity Bog
33	G. Cannon	165	45	20	47 gr	♂	6-18-38	Torrey
24	G. Cannon	150	37	20	46 gr	✓	6-17-38	Torrey
59	G. Cannon	158	39	19	49 gr	♀	6-21-38	Steep. Cr. Lake.
66	G. Cannon	165	42	20	44 gr	♀	6-22-38	Purity Bog.
50	G Cannon	169	52	20	36 gr.	♀	6-20-38	Steep Cr. Lake
706	J.W. Bee	174	51	21.5	79 gr.	♀	6-18-38	Torrey.
704	J.W. Bee	175	49	21.5	66 gr.	♀	6-18-38	Torrey
705	J.W. Bee	179	54	20.5	74 gr.	♀	6-18-38	Torrey
707	J.W. Bee	176	50	20	64 gr	♀	6-18-38	Torrey
703	J.W. Bee	180	51	21.5	62 gr	♀	6-18-38	Torrey
58	G. Cannon	163	38	20	78 gr	♀	6-21-38	Steep Cr. Lake
57	G. Cannon	175	41.5	20	67 gr	♀	6-21-38	Steep Cr. Lake
749	J.W. Bee	157	44	18.5	49 gr	♀	6-21-38	Steep Cr. Lake.
751	J.W. Bee	165	54	20.5	48 gr	♂	6-21-38	Steep Cr.
695	J.W. Bee	171	51	21	50 gr	♂	6-17-38	Torrey
736	J.W. Bee	170	46	20	62 gr	♂	6-20-38	Steep Cr.
696	J.W. Bee	176	49.5	20.5	52 gr	♀	6-17-38	Torrey
735	J.W. Bee	175	61	20	46 gr	♂	6-20-38	Steep Cr.
733	J.W. Bee	185	65	20	54 gr.	♂	6-20-38	Steep Cr.
732	J.W. Bee	185	65	24	56 gr	♀	6-20-38	Steep Cr.
34	G. Cannon	185	40	20	76 gr	♀	6-18-38	Torrey
41	G. Cannon	185	65	22	46 gr	♂	6-19-38	Steep Cr.
39	G. Cannon	180	60	20	42 gr	♀	6-19-38	Steep Cr.
35	G. Cannon	185	45	20	54 gr	♂	6-18-38	Torrey
694	J.W. Bee	184	50	21	66 gr	♂	6-17-38	Torrey
697	J.W. Bee	166	48	20	48 gr	♀	6-17-38	Torrey.
23	G. Cannon	149	35	20	46 gr	✓	6-17-38	Torrey
22	G. Cannon	165	40	20	83 gr	✓	6-17-38	Torrey
76	G. Cannon	151	48	20	25 gr	♂	6-25-38	Survivor Springs
777	J.W. Bee	168	61	21	40 gr	♂	6-24-38	Private Lake
36	G. Cannon	182	45	20	58 gr	♀	6-18-38	Torrey
778	J.W. Bee	176	60	21.3	45 gr.	♂	6-24-38	Private Lake.

Eutamias adsitus

723	J.W. Bee	202	94	31	42 gr	♀	6-19-38	Steep Creek
45	G. Cannon	230	80	32	47 gr	♀	6-20-38	Steep Creek
42	G. Cannon	198	85	30	46 gr.	♀	6-19-38	Steep Creek
724	J.W. Bee	204	91	29.5	50 gr.	♀	6-19-38	Steep Creek
726	J.W. Bee	194	90	31	46 gr.	♂	6-19-38	Steep Creek
63	G. Cannon	120	84	30	48 gr.	♀	6-21-38	Steep Creek

380708-240

46	G. Cannon	215	92	30	64gr.	♀	Step Creek	6-20-38
43	G. Cannon	200	80	30	48gr	♀	Step Creek	6-20-38
789	JnBee	203	86	31	46gr	✓	Private Lake	6-25-38
788	JnBee	197	84	30	✓	✓	Private Lake	6-25-38
787	JnBee	216	86	32	63gr	♂	Private Lake	6-25-38
739	JnBee	218	96	33	65gr	♀	Step Cr.	6-20-38
825	JnBee	223	96	33.5	62gr.	♀	Posy Lake	7-2-38
816	JnBee	209	94	33.5	60gr	♂	Indian Cr.	6-29-38
815	JnBee	211	68	34	50gr	♀	Indian Cr.	6-29-38

Eutamias dorsalis utahensis

851	JnBee-C.	216	94	32	48gr	♀	Calf Cr.	7-4-38.
852	JnBee-C.	219	90	33	65gr	♂	Calf Cr.	7-4-38
799	JnBee-C	205	92	32		♂	Calf Cr.	6-29-38
849	JnBee-C.	235	104	34	65gr.	♀	Calf Cr.	7-4-38.

Eutamias quadrivittatus lapidensis

656	JnBee	199	94	31	44gr	♂	Fruita	6-11-38
672	JnBee	222	97	32	60gr	♀	Fruita	6-13-38
666	JnBee	202	90	30	50gr	♀	Fruita	6-12-38
659	JnBee	212	91	32	68gr.	♀	Fruita	6-12-38
669	JnBee	—	—	31	85gr.	♀	Fruita	6-11-38
673	JnBee	216	94	32	53gr.	♀	Fruita	6-13-38 (?)
661	JnBee	203	86	31	59gr.	♂	Fruita	6-11-38 (?)
850	JnBee.	215	91	31	44gr.	♂	Calf Cr.	7-4-38

Neotoma lepida monstrabilis

13	G. Cannon	290	125	30	129gr.	—	Fruita	6-15-38
677	JnBee	279	125	28.5	109gr.	♀	Fruita	6-15-38
671	JnBee	280	117	30	118gr.	♀	Fruita	6-13-38
12	G. Cannon	303	128	31	120gr.	♀	Fruita	6-15-38
655	JnBee	283	123	29	129gr	♂	Fruita	6-11-38
1	G. Cannon	292	125	30	140gr	♂	Fruita	6-11-38
675	JnBee	286	133	30	134gr	♀	Fruita	6-15-38
670	JnBee	275	123	30	137	♀	Fruita	6-13-38
20	G. Cannon	227	100	31	75gr	—	Fruita	6-16-38
103	G. Cannon	195	133	30	138gr	♀	Calf Cr.	7-3-38
84	G. Cannon	298	150	36	—	♂	Moki Tanks	6-28-38
109	G. Cannon	230	103	30	72gr	♂	Calf Cr.	6-13-38

Citellus variegatus grammurus.

817	JnBee	458	205	56	—	♀	Moki Tanks	6-28-38
658	JnBee	455	195	62	662	♂	Fruita	6-12-38

Sylvilagus

717	T.B.W. Tanner	379	48	84	—	♂	Tanny	6-18-38

Thomomys.

74	G. Cannon	169	57	26	63	♀	Private Lake	6-25-38
55	G. Cannon	193	52.5	28	86	♀	Step Creek	6-20-38

Citellus lateralis lateralis

790	JnBee	295	99	45	204	♂	Private Lake	6-25-38
791	JnBee	283	96	46	208	♂	Private Lake	6-25-38
98	G. Cannon	289	90	37	234	♀	Posy Lake	7-1-38
71	G. Cannon	271	101	42	179	♂	Bowns P.	6-24-38
774	JnBee	281	106	44	205	♀	Private Lake	6-27-38

Tamiasciurus fremonti								
822	J.W.Bee	316	131	49	195gr	♂	Cyclone Lake.	7-1-38
820	J.W.Bee	322	130	51	228gr	♀	Cyclone Lake	7-1-38
819	J.W.Bee	322	135	49.5	190gr.	♀	Cyclone Lake	7-1-38
823	J.W.Bee	319	130	51	203gr.	♂	Cyclone Lake	7-1-38
821	J.W.Bee	265	105	49	122gr.	♂	Cyclone Lake	7-1-38
Citellus Leucurus Leucurus								
5	G. Cannon	219	66	38	110gr	♂	Fruita	6-12-38
716	J.W.Bee-W.T.	118	67	40	124gr	♀	Torrey	6-18-38
Dipodomys ordii cupidinus								
102	G. Cannon	249	138	40	—	♂	Calf Cr.	7-3-38
846	J.W.Bee	241	136	40	50gr	♀	Calf Cr.	7-3-38
830	J.W.Bee	226	148	40	58gr	♂	Calf Cr.	7-3-38
805	J.W.Bee	232	132	38	—	♂	Moki Tanks	6-28-38
Onychomys L. melanophyrs.								
833	J.W.Bee	131	45	20	25gr	♂	Calf Creek	7-3-38
Lasionycteris noctovagans								
6	G. Cannon	99	42	7	6gr	♂	Fruita	6-12-38
		Bat.						
668	J.W.B-G.C	72	30	6	5gr	—	Fruita	6-12-38
Peromyscus truei								
14	J. Cannon	150	80	21	14gr	—	Fruita	6-15-38
843	J.W.Bee	212	112	22	27gr	♀	Calf Cr.	7-3-38
842	J.W.Bee	187	91	22	25gr	♂	Calf Cr.	7-3-38
841	J.W.Bee	175	92	22	15gr	♀	Calf Cr.	7-3-38
657	J.W.Bee	169	93	22	16gr	♂	Fruita	6-11-38
85	J.W.Bee-GG.	170	95	22	—	♀	Moki Tanks	6-28-38
801	J.W.Bee	172	93	20.5	—	♂	Moki Tanks	6-28-38
834	J.W.Bee	178	95	22.5	18gr	♂	Calf Cr.	7-3-38
82	G. Cannon	170	90	22	—	♀	Moki Tanks	6-29/38
3	G. Cannon	167	90	20	—	♀	Fruita	6-11-38
Reithrodontomys megalotis megalotis								
7	G. Cannon	150	70	19	—	♀	Fruita	6-13-38
688	J.W.Bee	130	68	17	14gr	♂	Torrey	6-17-38
691	J.W.Bee	141	66	17	14gr	♂	Torrey	6-17-38
690	J.W.Bee	135	67	12.5	12gr	♂	Torrey	6-17-38
689	J.W.Bee	129	65	12	12gr	♂	Torrey	6-17-38
700	J.W.Bee	131	68	17	12gr.	♂	Torrey	6-18-38
30	G. Cannon	148	70	18	13gr.	♂	Torrey	6-18-38
683	J.W.Bee	136	64	12	15gr.	♀	Torrey	6-16-38
684	J.W.Bee	126	62	17	8.1/4gr.	♂	Fruita	6-16-38
31	G. Cannon	145	67.5	18	15gr.	♀	Torrey	6-18-38
32	G. Cannon	142	47	16.5	11gr.	♂	Torrey	6-18-38
701	J.W.Bee	139	69	17.3	12gr.	♀	Torrey	6-18-38
Sorex palustris navigator.								
18	G. Cannon	150	70	20	13	♀	Fruita	6-16-38
Peromyscus m. s								
803	J.W.Bee	139	66	20.5	—	♂	Moki Tanks	6-28-38
721	J.W.Bee	166	75	19.5	31gr.	♂	Slop Cr.	6-19-38
766	J.W.Bee	167	76	19	23gr.	♂	Slop Cr.	6-22-38
776	J.W.Bee	152	68	20.3	17gr.	♀	Private Lake	6-24-38

	29	G. Cannon	160	67	19.5	21 gr	♂	Torrey	6/18/38
	650	J. Bee	148	64	20	—	♀	Fruita	—
	741	J. Bee	138	59	19	12 gr	♂	Sleep Cr.	6/20/38
	96	G. Cannon	166	72	20	23.5 gr.	♀	Posy Lake	7/1/38
	107	G. Cannon	—	70	20	—	♂	Calf Creek	7/3/38
	89	G. Cannon	150	20	19	15 gr.	♀	Posy Lake	7/1/38
	45	G. Cannon	150	62	19	17 gr.	♀	Posy Lake	7/1/38
	88	G. Cannon	156	70	20	29 gr.	♀	Posy Lake	7/1/38
	21	G. Cannon	162	70	20	24 gr.	—	Torrey	6/17/38
	742	J. Bee	161	75	21	28 gr.	♂	Sleep Creek	6/20/38
	40	G. Cannon	160	65	19	23 gr.	♂	Sleep Creek	6/19/38
	16	G. Cannon	153	67	22	19 gr.	♂	Fruita	6/15/38
	15	G. Cannon	156	65	20	20 gr.	—	Fruita	6/15/38
	756	J. Bee	150	71	19	21 gr.	♀	Sleep Cr.	6/21/38
	45	G. Cannon	164	70	20	31.5 gr	♀	Survour Springs	6/26/38
	106	G. Cannon	145	67	20	19 gr	♀	Calf Cr.	7/3/38
	94	G. Cannon	176	65	20	42.5 gr	—	Posy Lake	7/1/38
	702	J. Bee	141	66	19.5	18 gr	♀	Torrey	6/18/38
	720	J. Bee	169	76	20.3	36 gr	♀	Sleep Cr.	6/19/38
	792	J. Bee	169	73	18.5	24 gr	♀	Private Lake	6/25/38
	4	G. Cannon	157	65	22	— gr.	♂	Fruita	7/4/38
	105	G. Cannon	150	54	21	24 gr.	♂	Calf Cr.	7/3/38
	800	J. Bee	132	60	20	—	♀	Moki Tanks	6/28/38
	83	G. Cannon	150	62	20	—	♀	moki Tanks	6/28/38
	804	J. Bee	154	69	20.5	—	♀	Moki Tanks	6/28/38
	802	J. Bee	147	69	21	—	♂	Moki Tanks	6/28/38
	826	J. Bee	155	75	21	21 gr	♂	Calf Cr.	7/3/38
	837	J. Bee	161	64	21	23 gr.	♂	Calf Cr.	7/3/38
	838	J. Bee	170	70	20	23 gr.	♂	Calf Cr.	7/3/38
	101	J. Bee	—	—	—	—	♀	Calf Cr.	7/3/38

Ochotoma

	784	J. Bee	200	—	30	184 gr	♂	Private Lake	6/25/38
	785	J. Bee	185	—	28	144 gr	♀	Private Lake	6/25/38
	786	J. Bee	190	—	30	144 gr	♂	Private Lake	6/25/38
	783	J. Bee	180	—	28	130 gr	♂	Private Lake	6/25/38
	73	G. Cannon	200	—	30	196 gr.	♀	Private Lake	6/25/38

COLLECTION
Field
No. Collector Length tail Foot weight Sex Locality date

Birds

829 Cyanocitta S. cottami
746 Agelaius p. nevadensis
743 Passerculus grammacus confinis
811 Myiarchus c. cinerascens.
679 Sayornis saya saya
747 Rhyochanes R. richardsoni
718 Melospiza lincolni
853 Myiochanes R. richardsoni
824 Oligobates pubescens leucurus
681 Oligobates villosus leucotharetus
745 Agelaius p. nevadensis
654 Aeronautes saxatalis saxatalis.
725 Melospiza lincolni
812 Baeolophus inornatus griseus
810 Baeolophus inornatus griseus.
692 Passerculus s. nevadensis
693 Passerculus S. nevadensis
699 Passerculus S. nevadensis
680 Melospiza M fallax
809 Empidonax wrightii (?)
803 Sitta pygmaea melanotis
765 Sitta canadensis nelsoni
808 Psaltriparus m. plumbeus
814 " " "
686 Vireo solitarius plumbeus
854 Archilochus alexandri (?)
665 Dendroica nigrescens.
855 Flycatcher (?)
651 Spinus psaltria hesperophilus

MAMMALS AND BIRDS COLLECTED. 380708-242

marmota flaviventris engelhardti
microtis mordax mordax
Eutamias adsitus
Eutamias dorsalis utahensis
Eutamias quadrivittatus hopiensis
Neotoma lepida monstrobilis
Citellus grammurus grammurus
Sylvilagus auduboni baileyi
Thomomys
Citellus lateralis lateralis
Tomia sciurus fremonti
Citellus leucurus leucurus
Dipodomys ordii cubidinus
Onychomys leucogaster melanophrys
Lasionycteris noctovagans.
Peromyscus truei
Reithrodontomys megalotis megalotis
Sorex palustris navigator
Peromyscus maniculatus sonoriensis
Ochotona schisticeps
Cyanocitta s. cottami
Aquilaius p. nevadensis
Poecetes grammurus confinis
Myiarchus cinerascens cinerascens
Sayornis saya saya
Myiochanes richardsoni richardsoni
Melospiza lincolni lincolni
Dryobates pubescens leucurus
Dryobates villosus leucothorectus
Areonautus saltatalis saltalalis
Baelophus inornatus griseus
Passerculus sandwichensis nevadensis
Melospiza melodia fallax
Empidonax wrighti;
Psaltriparus minimus plumbeus
Sitta carolinensis nelsoni
Sitta pygmae melanotis
Archilochus alexandri
Dendroica nigrescens.
Spinus psaltria hesperaphilus.

650-38-J.B	Peromyscus	Fruita, Wayne 380708-243 → Co., Utah	6/10/38
651-38 J.B	Spinus p. h.	" "	"
652-38-J.B.	Spinus p. h.	" " "	"
653-38-J.B	Poliopila c. a.	" " "	"
654-38 J.B	Aeronatus s. s.	" " "	"
655-38 J.B	Neotoma	" " "	6/11/38
656-38 J.B.	Eutamias	" " "	"
657-38 J.B	Peromyscus	" " "	"
658-38 J.B.	Citellus g. g.	" " "	"
659-38 J.B.	Eutamias	" " "	"
660-38 J.B	Eutamias	" " "	"
661-38 J.B	Eutamias	" " "	"
662-38 JB	Baelophos i. g.	" " "	"
663-38 J.B	Baelophus. i. g.	" " "	"
664-38 J.B	Baelophus i. g.	" " "	"
665-38 J.B	Peromyscus	" " "	6/12/38
666-38 JB	Eutamias	" " "	"
667-38 J.B.	Neotoma	" " "	"
668-38 J.B	Bat	" " "	"
669-38 J.B	Eutamias	" " "	"
670-38 J.B	Neotoma	" " "	6/13/38
671-38 J.B	Neotoma	" " "	"
672-38 J.B	Eutamias	" " "	"
673-38 J.B.	Eutamias	" " "	"
674-38 J.B	Vulpes	Floral Ranch	6/14/38
675-38 J.B	Neotoma	Fruita, Wayne Co., Utah	6/15/38
676-38 J.B	Peromyscus	" " "	"
677-38 J.B	Neotoma	" " "	"
678-38 J.B.	Neotoma	" " "	"
679-38 J.B.	Flycatcher.	" " "	"
680-38 J.B	Melospiza m. fallax	" " "	"
681-38 J.B	Dryobates v. Leucothoreclus	Floral Ranch "	6/14/38
682-38 J.B.	House mouse	Fruita, Wayne Co., Utah	6/16/38
683-38 J.B	Reithrodontomys m. m.	" " "	"
684-38 J.B	Reithrodontomys m. m.	" " "	"
685-38 J.B.	Neotoma	" " "	"
686-38 J.B.	Vireo s. p.	" " "	"
687-38 J.B.	Tachycineta t. Lepida	" " "	"
688-38 J.B	Reithrodontomys m. m.	Torrey, Wayne Co., Utah	6/17/38
689-38 JB	Reithrodontomys m. m.	" " "	" " "
690-38 JB	Reithrodontomys m. m.	" " "	" " "
691-38 J.B	Reithrodontomys m. m.	" " "	"
692-38 J.B	Passerculus s. n.	" " "	6/17/38
693-38 J.B	Passerculus s. n.	" " "	"
694-38 J.B.	Microtis	" " "	"
695-38 J.B	microtis	" " "	"
696-38 J.B	microtis	" " "	"
697-38 J.B	microtis	" " "	"
698-38 JB	microtis	" " "	"
699-38 JB	Passerculus s. n.	" " "	"
700-38 J.B.	Reithrodontomys	Torrey, Wayne Co., Utah	6/18/38
701-38 J.B.	Reithrodontomys	" " "	"
702-38 J.B	Peromyscus	" " "	"

703 – 38 J.B.	microtis m.m.	Torrey,	Wayne	Co.,	Utah			6/18/38
704 – 38 J.B	microtis m.m.	"	"	"	"			"
705 – 38 J.B.	microtis m.m.	"	"	"	"			"
706 – 38 J.B.	microtis m.m.	"	"	"	"			"
707 – 38 J.B.	microtis m.m.	"	"	"	"			"
708 – 38 J.B.	microtis m.m.	"	"	"	"			"
709 – 38 J.B	Reithrodontomys	"	"	"	"			"
710 – 38 J.B	microtis m.m.	"	"	"	"			"
711 – 38 J.B.	microtis m.m.	"	"	"	"			"
712 – 38 J.B.	microtis m.m.	"	"	"	"			"
713 – 38 J.B.	Passerculus s.m.	"	"	"	"			"
714 – 38 J.B.	Passerculus "s.m.	"	"	"	"			"
715 – 38 J.B	Citellus L. Leucurus	"	"	"	"			"
716 – 38 J.B	Citellus L. leucurus	"	"	"	"			"
717 – 38 J.B	Sylvilagus m. b.	"	"	"	"			"
718 – 38 J.B	melospiza L.L.	Steep	Cr.,	Aquarius	Plateau,	Gar.	Co.	6/19/38
719 – 38 J.B	microtis	"	"	"	"	"	"	"
720 38 J.B	Peromyscus	"	"	"	"	"	"	"
721 38 J.B	Peromyscus	"	"	"	"	"	"	"
722 38 J.B	Peromyscus	"	"	"	"	"	"	"
723 38 J.B	Eutamias	"	"	"	"	"	"	"
724 38 J.B	Eutamias	"	"	"	"	"	"	"
725 38 J.B	melospiza L.L.	"	"	"	"	"	"	"
726 38 J.B	Eutamias	"	"	"	"	"	"	"
727 38 J.B	Eutamias	"	"	"	"	"	"	"
728 38 J.B	Peromyscus	"	"	"	"	"	"	"
730 38 J.B	microtis	"	"	"	"	"	"	6/20/38
731 38 J.B	microtis	"	"	"	"	"	"	6/20/38
732 38 J.B	microtis	"	"	"	"	"	"	"
733 38 J.B	microtis	"	"	"	"	"	"	"
734 38 J.B	Peromyscus	"	"	"	"	"	"	"
735 38 J.B	microtis	"	"	"	"	"	"	"
736 38 J.B	microtis	"	"	"	"	"	"	"
738 38 J.B	microtis	"	"	"	"	"	"	"
739 38 J.B.	Eutamias	"	"	"	"	"	"	"
740 38 J.B.	microtis	"	"	"	"	"	"	"
741 38 J.B.	Peromyscus	"	"	"	"	"	"	"
742 38 J.B	Peromyscus	"	"	"	"	"	"	6/20/38
743 38 J.B	Poecetes g.c.	"	"	"	"	"	"	6/21/38
744 38 J.B	Zonotrichia L.L.	"	"	"	"	"	"	"
745 38 J.B	Agelaius p.m.	"	"	"	"	"	"	"
746 38 J.B.	Agelaius p.m.	"	"	"	"	"	"	"
747 38 J.B	Myiochanes r.r.	"	"	"	"	"	"	"
748 38 JB	microtis	"	"	"	"	"	"	"
749 38 JB	microtis	"	"	"	"	"	"	"
750 38 JB.	microtis	"	"	"	"	"	"	"
751 38 J.B	microtis	"	"	"	"	"	"	"
752 38 J.B	microtis	"	"	"	"	"	"	"
753 38 J.B.	Peromyscus	"	"	"	"	"	"	"
754 38 J.B	microtis	"	"	"	"	"	"	"
755 38 J.B	Peromyscus	"	"	"	"	"	"	"
756 38 JB	Peromyscus	"	"	"	"	"	"	"
757 38 J.B.	Agelaius p.m.	"	"	"	"	"	"	"
758 38 J.B.	microtis	"	"	"	"	"	"	6/22/38
759 38 J.B.	Peromyscus	"	"	"	"	"	"	"
760 38 - JB.	microtis	"	"	"	"	"	"	"

380708-245

76138 J.B.	Omit		
76238 J.B.	microtis	Steep Cr., Aquarius Plateau, Gar. Co, Ut.	6/22/38
76338 J.B.	Omit (Peromyscus)		
76438 J.B.	Peromyscus	Steep Cr., Aquarius Plateau, Gar. Co., Ut	6/22/38
76538 J.B.	Sitta c. n.	" " "	"
76638 J.B	Peromyscus	" " "	"
76738 J.B.	Peromyscus	" " "	6/23/38
76838 J.B.	Peromyscus	" " "	"
76938 J.B.	Peromyscus	" " "	"
77038 J.B	Peromyscus	" " "	"
77138 J.B.	Peromyscus	" " "	"
77238 J.B.	Eutamias	" " "	"
77338 J.B.	Vireo		
77438 J.B.	Citellus L. L.	Private Lake, Aquarius Plateau, Gar. Co	6/24/38
77538 J.B.	Peromyscus	" " "	"
77638 J.B.	Peromyscus	" " "	"
77738 J.B.	microtis	" " "	"
77838 J.B.	microtis	" " "	"
77938 J.B.	microtis	" " "	"
78038 J.B	marmota f. c.	" " "	"
78138 J.B	Hermit Thrush	" " "	"
78238 J.B.	melospiza L.L. (eggs)	" " "	"
78338 J.B	Ochotona	" " "	6/26/38
78438 J.B	Ochotona	" " "	"
78538 J.B	ochotona	" " "	"
78638 J.B.	Ochotona	" " "	"
78739 J.B.	Eutamias	" " "	"
78838 J.B.	Eutamias	" " "	"
78938 J.B.	Eutamias	" " "	"
79038 J.B.	Citellus L.L.	" " "	"
79138 J.B.	Citellus L.L.	" " "	"
79238 J.B.	Peromyscus	" " "	"
79338 J.B.	Peromyscus	" " "	"
79438 J.B.	Peromyscus	" " "	"
79538 J.B.	Peromyscus	" " "	"
79638 J.B.	Junco caniceps (eggs)	" " "	"
79738 J.B.	Erethizon.	" " "	"
79838 J.B.	Peromyscus	Scout Lake, Aqu. Plat., Gar. Co., Ut.	6/26/38
79938 J.B.	Eutamias o. h.	Moki Tanks, Circle Cliffs, Gar. Co. Ut	6/28/38
80038 J.B	Peromyscus	" " "	"
80138 J.B	Peromyscus	" " "	"
80238 J.B.	Peromyscus	" " "	"
80338 J.B.	Peromyscus	" " "	"
80438 J.B.	Peromyscus	" " "	"
80538 J.B.	Dipodomys	" " "	"
80638 J.B.	Sylvilagus	" " "	"
80738 J.B.	Dendroica nigrescens	" " "	"
80838 J.B.	Psaltriparus m. p.	" " "	"
80938 J.B.	Empidonax w.	" " "	"
81038 J.B.	Baelophus i. g.	" " "	"
81138 J.B.	Myiarchus c. c.	" " "	"
81238 J.B.	Baelophus i. g.	" " "	"
81338 J.B.	Sitta pygmae melanotis	" " "	"
81438 J.B.	Psaltriparis m.p	" " "	"
81538 J.B.	Eutamias	Head Ind. Gulch, Gar. Co., Utah	6/29/38
81638 J.B.	Eutamias	" " "	"

		380708-246				
81738	J.B	Citellus 8.8.	moki tank, Circle Cliffs, Gar. Co., Ut.			6/28/38
81838	J.B	Sitta pygmae melanotis	Head Ind. Gulch, Gar. Co., Utah			6/27/38
81938	J.B.	Eamrasciprus F.	Cyclone Lake, Gar. Co., Utah			6/1/38
82038	J.B.	Eamroscipurus F.	Cyclone L.	Aqu. Plateau,	Gar. Co., Ut.	7/1/38
82138	J.B.	Eamrascfurus F.	"	"	" "	"
82238	J.B.	Eamiasciurus F.	"	"	" "	"
82338	J.B.	Tamiasciurus F.	"	"	" "	"
82438	J.B.	Dryobates p. L.	"	"	" "	"
82538	J.B.	Eutamias	Posey L.	Aqu. Plateau,	Gar. Co., Ut.	7/2/38
82638	J.B.	Peromyscus	"	"	" "	"
82738	J.B.	Peromyscus	"	"	" "	"
82838	J.B.	Peromyscus	"	"	" "	"
82938	J.B.	Cyanocitta u.	"	"	" "	"
83038	J.B.	Dipodomys	calf Cr.,	Garfield Co.,	Utah	7/3/38
83138	J.B.	Peromyscus	mouth Calf Cr.,	Gar. Co.,	Utah	"
83238	J.B.	Dipodomys	"	"	"	"
83338	J.B.	Onychomys L. m.	"	"	"	"
83438	J.B.	Peromyscus t.	"	"	"	"
83538	J.B.	Peromyscus	"	"	"	"
83638	J.B.	Peromyscus	"	"	"	"
83738	J.B.	Peromyscus	"	"	"	"
83838	J.B.	Peromyscus	"	"	"	"
83938	J.B.	Peromyscus	"	"	"	"
84038	J.B.	Peromyscus	"	"	"	"
84138	J.B.	Peromyscus t.	"	"	"	"
84238	J.B.	Peromyscus t.	"	"	"	"
84338	J.B.	Peromyscus t.	"	"	"	"
84438	J.B.	Peromyscus	"	"	"	"
84538	J.B.	Dipodomys	"	"	"	"
84638	J.B.	Dipodomys	"	"	"	"
84738	J.B.	Peromyscus	"	"	"	"
84838	J.B.	Omitted.				
84938	J.B.	Eutamias d. ut.	mouth Calf Cr.,	Gar. Co.,	Utah.	7/4/38
85038	J.B.	Eutamias a.h.	"	"	"	"
85138	J.B.	Eutamias d. ut.	"	"	"	"
85238	J.B.	Eutamias d. ut.	"	"	"	"
85338	J.B.	Myiochanes r.r.	"	"	"	"
85438	J.B.	Archeloches a.	"	"	"	"
85538	J.B.	Warbler	"	"	"	"
85638	J.B.	Dryobates p. L.	"	"	"	"
85738	J.B.	Peromyscus	"	"	"	"
85838	J.B.	Omitted				
85938	J.B.	Peromyscus	mouth Calf Cr.,	Gar Co.,	Ut.	7/4/38
86038	J.B.	Peromyscus	"	"	"	"
86138	J.B.	Omitted				
86238	J.B.	Peromyscus	mouth Calp Cr.,	Gar. Co.,	Utah	7/4/38
86338	J.B.	Peromyscus	"	"	"	"
86438	J.B.	Peromyscus	"	"	"	"
86538	J.B.	Peromyscus	"	"	"	"
86638	J.B.	Peromyscus	"	"	"	"
86738	J.B.	Peromyscus.	"	"	"	"
86838	J.B.	Omitted.				
87138	J.B.	Sitta p. m.	Head Ind. Gulch,	Gar. Co.,	Utah	6/27/38

380708-247

R.2 E. R.3 E. R.4 E. R.5 E. R.6 E. R.7 E.

FISHLAKE NAT. FOR.
Ft. Hills Thousand Lake Mts.

Torrey
Teasdale
Grover
Fruita
Notom
Capitol Reef Cliffs
Capitol Wash
WATER POCKET RIVER
FREMONT
Meridein
Glade Valley
Fremont Valley
Smooth Knoll
Timbered Knoll
Parallel
Miller Cr.
Miller L.
Lookout Pk. 11133
Bluebell Knoll
Donkey Pt.
Donkey Reservoir
Lower Reservoir
Pine Cr. Reservoir
Aquarius G.S.
Government Pt.
Horse L.
Lara L.
Spruce Spr.
Cottonwood Spr.
Rabbit Brush Spr.
Bullberry Reservoir
Black Ridge
Teasdale R.S.
Hunt R.
Browns Cr.
Sulphur Cr.
Copper Mine
Lyman Mill
Jackson Mill
Miners Mt.
Twin Pks.
Pleasant Cr. Pt.
Covington R.
Chokecherry Pt.
Tantalus
Keller Knoll
Wildcat R.S.
Bowns Reservoir
Aspen Spr.
Aspen Pt.
Durfee Mill
Oak Cr. Pt.
Pleasant Cr. Meadows
Oak Cr. Reservoir
Round Lks.
Deer Lks.
Bowns Pt.
East End Pt.
Dry Bench
Edmunds Hole
Blue Grass
Coleman
Sand
Birch Cr.
North Can.
South Can.
WAYNE CO.
GARFIELD CO.
BOULDER MOUNTAIN
PLATEAU
Boulder Meadows
Pleasant Cr. Meadows
Beef Meadows
E. Boulder Lks.
Stink Lks.
Bakeskallet L.
Dog L.
Big L.
Blue L.
Rock Spr.
Lava Spr.
Broken Draw
Spectacle Lks.
Purple L.
Ruma Four Lks.
Crescent L.
Circle L.
Five Lks.
Half Moon L.
Trail Pt.
Baker L.
Dividel
Baker R.
South Pt.
Grass L.
Long L.
Steep Cr. L.
Deer Lks.
Lone L.
West Deer Bowns L.
Bowns L.
Roundy Reservoir
Roundy Spr.
Jacobs Reservoir
Jacobs Reservoir Dam
Jubilee G.S.
Schurz R.
Auger Hole L.
Burr Top
Barney L.
Bare L.
Small L.
Cuddyback
McGath L.
Basin Flats
Bowmill Pk.
Colemans Mill
Hams R.
Deer Mtn.
Peters R.
Rawlins R.
Ormand R.
Jeposen R.
Ormand Pt.
Mud Holes
Mt. Ogden
Baker R.
Peters R.
Sadies Nipple
Hale R.
King R.
Baker G.S.
Sugar Loaf
Boulder
New Home Bench
Lone Neck
Lone Neck Cabin
Impossible Pk. 7784
Lamp Stand
The Flats
Cliffs Canyon
Roger Pk.
Cyclone L.
Colonel L.
Green L.
Blue Spr.
Deer Spr.
Water Hol. Cr.
Compuncher Wash
Grimes Cr.
Sweetwater Cr.
Side Cr.
Death Draw
Buckhorn Draw
Bumbery Hol.
Buck Hol.
Upper Spr.
Skull Spr.
Black Hills
The Box
Roundy R.
Sulphur Spr.
Sulphur Spr. Hol.
Right Fk. Wide Hol.
Monie Cr.
Wolverine Cr.
Horse Hollow
Death Hollow
Escalante River
Hall R. Escalante
Heaps R.
Potato Valley
Little Desert
Escalante
Escalante R.S.
Heaps Wash
Escalante Rim South 7149
T. 35 S.

POWELL NATIONAL FOREST
UTAH.
1937

U.S. Dept Agric Forest Servic

380208-248

Salt Lake City
Ogden
Provo
Evanston
Lyman
Mountainview
Bountiful
Murray
Park City
Heber
Grantsville
Tooele
Bingham Canyon
Lehi
American Fork
Springville
Spanish Fork
Payson
Eureka
Santaquin
Nephi
Delta
Fillmore
Richfield
Salina
Manti
Ephraim
Gunnison
Moroni
Mt Pleasant
Fairview
Huntington
Castle Dale
Price
Helper
Kenilworth
Wellington
Sunnyside
Columbia
Woodside
Greenriver
Roosevelt
Duchesne
Myton
Bridgeland
Fruitland
Hanna
Hickman
Tabiona
Mountain Home
Altonah
Cedarview
Neola
Whiterocks
Tridell
Lapoint
Leeton
Upalco
Talmage
Bluebell
Hayden
Ioka
Randlett
Fort Duchesne
Gusher
Ouray
Evanston
Millburne
Piedmont
Robertson
Knight
Hilliard
Goodman Ranch
Castle Rock
Echo Canyon
Coalville
Hoytsville
Wanship
Peoa
Oakley
Kamas
Holiday Park
Rigbys Ranch
Upton
Lonetree
Burntfork
McKinnon
Antelope
Bull Park
Henrys Fork
Beaver L.
Fish L.
Deadman Mtn
Wasatch Nat'l Forest
Uinta Nat'l Forest
Ashley National Forest
Kings Peak 13498
Highest Point in Utah
Mt. Watson 11473
Mt. Emmons 13428
Mt. Agassiz 12460
Mt. Powell 12473
Mt. Lovenia 13227
Mt. Lagoon 12750
Mt. Lagoon 13209
Mt. Lagoon 13200
Mt. Lagoon 12716
Mt. Lagoon 12680
Mt. Lagoon 12013
Mt. Lagoon 12219
Mt. Lagoon 12719
Mt. Lagoon 12720
Mt. Lagoon 12750
Mt. Lagoon 13449

(for 7/10/38 see insert page 103) 380720-249

7/20/38

Spent three days on trip through Parks with Mil, Cub, Ray, Burnett, Mary & Mother. Our objective being to visit Zions and Grand Canyon the first day; Bryce and a portion of the Aquarius the second day and Wayne wonderland the third day. Made a few selective observations and attempted to formulate a time chart for this trip. With sleeping equipment and cooking pots left Provo at 6:50 A.M with mileage 25,732

Town	Accumulative Time	Miles to Next Town.	Remarks
Provo	6:50 A.M	6	
Springville	7:00 A.M	6	
Spanish Fork	7:10 A.M	5	
Salem	7:14 A.M	4	
Payson	7:18 A.M	6	5 min stop
Santaquin	7:30 A.M	13	
Mona	7:45 A.M	7	
Nephi	7:55 A.M.	11	
Lavan	8:08 A.M.	25	
Fayette	8:35 A.M.	6	
Sunnyside	8:41 A.M	2	
Centerfield	8:45 A.M	5	
Redmond	8:55 A.M	3	
Salina	9:00 A.M.	5	8 min stop
Aurora	9:17 A.M.	6	
Sigurd	9:26 A.M,	8	
Richfield	9:38 A.M.	7	
Elsinore	9:50 A.M	6	
Joseph	10:00 A.M.	3	
Sevier	10:05 A.M,		
Marysvale	10:25 A.M.		
Circleville	10:43 A.M,	7	
Piute Reservoir	10:55 A.M.	32	
Panguitch	11:30 A.M.	7	Lunch, 35 min stop
Bryce Junction	12:15 A.M.	8	
Hatch	12:26 A.M,	3	
Orderville	1:09 P.M.	3	
Mt. Carmel	1:13 P.M.	2	
Zion Junction	1:16 P.M.	25	
Zion Entrance	1:41 P.M.	60	Spent 1 hr. 19 min at Zions & drove to narrows & back.
Zion Entrance	3:30 P.M.		
Zion Junction	3:56 P.M	17	14 min stop.

Kanab 380720-250	4:32 P.m.	7	9 min Stop.	
Fredonia	4:50 P.m	?		
Entrance Kaibab Natl Forest	?	40.9		
V. T. Ranch	6:35 P.m	5.6	5.6 to Entrance and 21.6 to Lookout	
Entrance to Grand Canyon Natl Park	6:43 P.m	?		
Junction to Cape Royal	6:58 P.m	?		
Look. Out Point	7:16 P.m	21.6 - 3.6	10 min Stop.	
Vista Encantada	7:24 P.m	?		
Cape Royal.	7:42 P.m.	Spent night on rim mileage 26168 — Trip so far 431.3 miles.		
7/21/39	next morning			
Cape Royal.	8:00 A.m.		mileage 26163	
Junction to Imperial	8:22 A.m			
Point Imperial	?			
Grand Canyon Lodge.	10:20 A.m			
Junction	10:25 A.m			
Bryce Junction	3:44 P.m.	15		
Turning off to Bryce	4:01 P.m	5		
Leaving Bryce	5:04 P.m.	5	Detained	
Turn off	5:17 P.m.	13		
Nidaloe	5:25 P.m	28		
Divide of Sweetwater and Birch Cr.	5:54 P.m			
Escalante	6:32 P.m	16		
Posey Lake	?		Camped at no. 1 site	
7/22/39	next morning.			
Posey Lake	7:10 A.m	approx 2		
Junction	7:21 A.m.	28		
Compuncture Creek	7:37 A.m			
Boulder	9:15 A.m	17.7	10 min Stop.	
Govern's Point	10:00 A.m.	?		
Divide	10:20 A.m	?		
Oak Creek Camp	?	?	35 min Stop for lunch	
Torrey	12:25 P.m	12		
Fruita	1:13 P.m	12		
Head Capital Wash	1:40 P.m	?		
East end of wash	2:10 P.m	?		
Back to Torrey	3:55 P.m.	9		
Bicknell	4:13 P.m	5		
Lyman	4:21 P.m	3		
Loa	4:26 P.m	42		
Sigurd	5:35 P.m	11		
Salina	6:00 P.m	—	mileage at Salina 26620	

Traveling through Kaibab Forest recorded succession of flora and occurrance of animal life.

Deer and flora	Mileage	Position
Artemesia flats	55.0	Entering Kaibab Natl F.
Cliff rose beginning to appear but Junipers and pinyon dominant	57.3	
Few oak and service berry starting at	6:0.0	
First Ponderosa pine	60.4	
Ponderosa pine now dominant	62.0	
Lupine profusely mating forest floor & bin blossom	63.4	
Few aspen & first ones	70.7	
Three raven	76.0	
Firs and Spruces	76.1	
Spruces, fir, aspen and associated flora replacing the Ponderosa Pines	76.5	
First deer	79.5	
~~aspen, firs & Spruce with~~ open savannahs and grass-lands.	88.5	Head of first Savannah
Two deer	94.6	
Seven deer	95.1	
Open savannah bordered by aspen & Conifer	95.9.	V.T. Ranch. (6:35 P.M)
Three deer	97.7	
Two deer	98.4	
one deer	99.4	
	01.5	Entrance to Natl Park.
Few Ponderosa Pine	05.1	
Two deer	10.6	
One deer	11.7	Beyond junction to Cape Royal.
One deer	13.3	
Two deer	16.7	
	17.8	Lookout Point.
One deer	19.4	

One deer 380720-252	23.3
Five deer	25.6
One deer	26.1
Two deer	27.9
One deer	28.6

— Cape Royale

Return trip next morning.

Two deer	01.9	Left Cape Royal and visited Imperial point and Grand Canyon Lodge.
One deer ♂	05.5	
Four deer ♀	10.7	
Two deer ♂ ♀	17.8	
One deer ♂	19.8	
Two deer ♂ ♂	23.3	
Junction	32.2	Junction
1 Deer ♀	64.7	

Conclusions. 33 deer first evening trip
13 deer on return trip in morning.

It would appear that the deer are more active in the evening than in the morning also they had a tendency to feed in groups of 1 to 7. One found the bucks associated together and mixed in among the females

From the Posy Lake Camp around east end of Boulder mountain to Torrey recorded onanimal and bird life as was seen along side of road while traveling. Plant life associated with animal observations & correlated with mileage.

Junction leading to Posy lake from main road was the starting point and observations made between 7:21 A.M to 12:25 P.M. on the 22 of July, 1938

Mileage	Observation.	Remarks.
00.0	Junction	
00.7	2 male deer.	appeared more afraid than those at Kaibab. Beautiful bucks with velvet covered horns. Among the Ponderosa & aspen.
00.7	Citellus l. lateralis (?)	
01.0	Eutamias.	Probably adsitus

01.3	Road Fence	
01.5	Eutamias	Probably Eu. adsectus
01.6	Rock Wren	
02.6	Sciurus fremontii	
03.8	Citellus l. lateralis (? Sp.)	Subspecies doubtful
03.9	Citellus l. lateralis (? Sp.)	"
04.0	Citellus l. lateralis (? sp.)	7.37 A.M.
04.8	Eutamias	Probably Eu. adsectus
05.5	Citellus l. lateralis (? sp.)	Sub. doubtful
05.7	Citellus l. lateralis (? sub. sp.)	
06.6	Rock Wren	
06.8	Citellus l. lateralis	
06.9	Eutamias.	Probably Eu. adsectus
07.6	Citellus l. lateralis (? Sub)	
07.8	" " "	"
09.4	" " "	"
09.7	" " "	"
10.4	" " "	"
11.1	" " "	"
12.4	" " "	"
13.0	" " "	"
13.1	" " "	"
14.3	" " "	"
15.4	2 citellus l. lateralis.	Were seen together
17.6	citellus l. lateralis	
19.2	Sylvilagus.	
19.4	Eutamias	Probably Eu. adsectus
29.6	Eutamias	Probably Eu. adsectus
29.6	Arrived at Boulder	9:15 A.M.
31.5	Leaving North end of boulder at Store.	
37.6	Citellus l. lateralis	
37.9	Eutamias	
40.3	Citellus l. lateralis	
41.0	" " "	
41.7	" " "	
42.6	" " "	
43.2	Government Point.	10:00 A.M.
44.4	citellus l. lateralis	
45.2	" " "	
48.1	" " "	
59.6		
70.0 (?)	(D) Citellus l. lateralis	
	Torrey.	

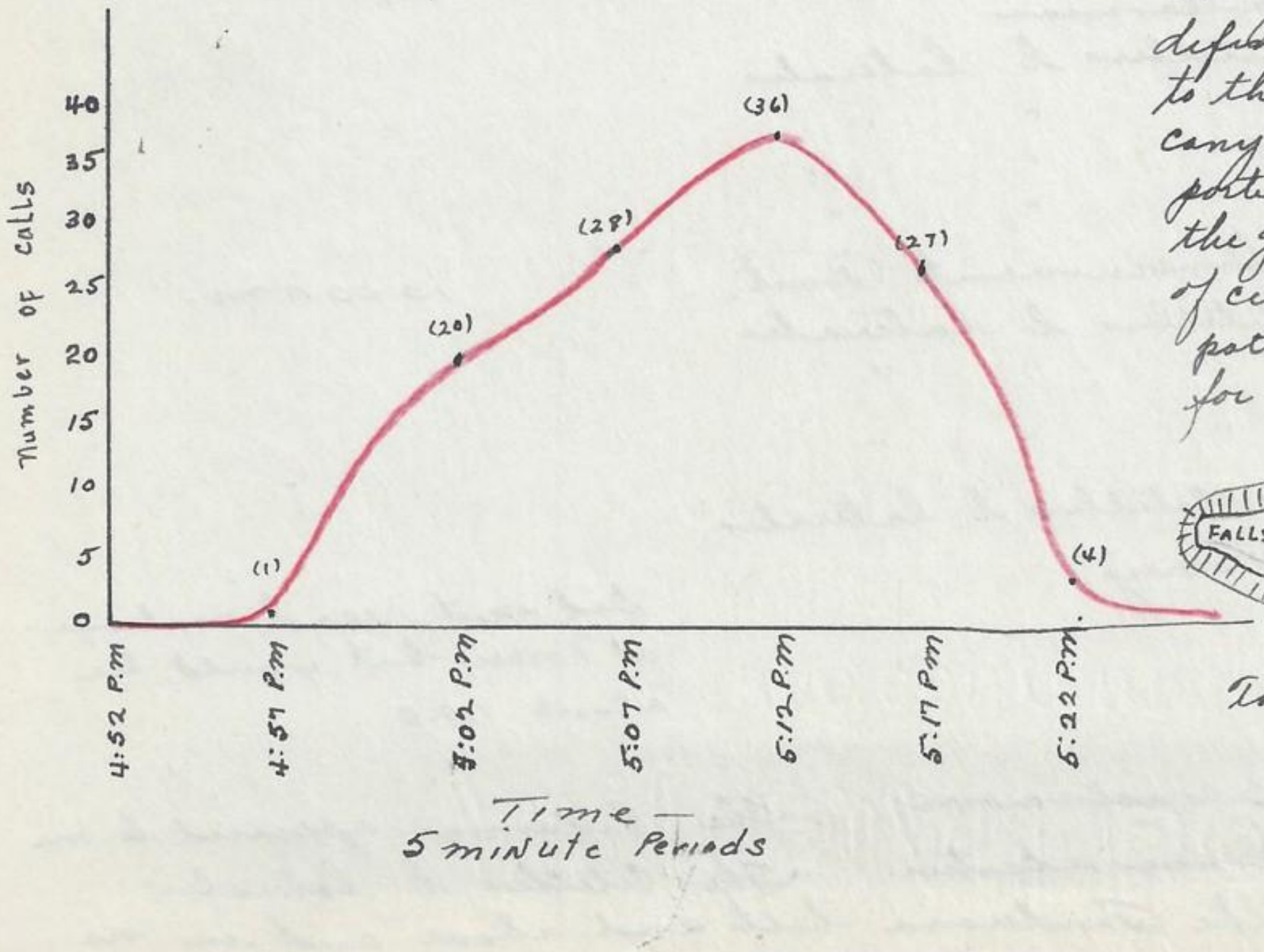
Did not record mileage at Torrey but would be about 70.0

Summary and conclusions: The Eutamias appeared to me to all be Eutamias adsectus. The Citellus l. lateralis conformed to the Ponderosa belt and above and in no

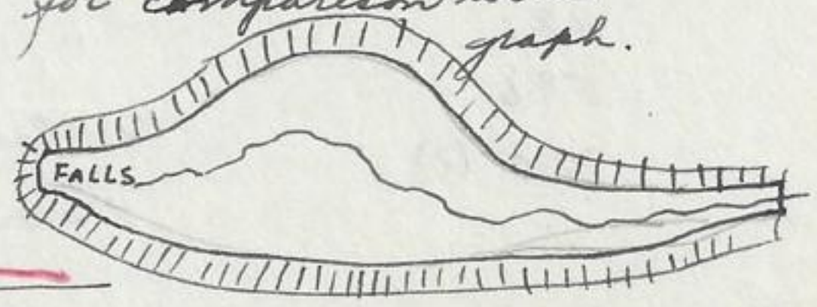
instance were they found below the lower level of the very definite pine Zone. Rather parculiar that they should be seen more frequently on the west side of the Aquarius and decidedly lacking in numbers on the east side of mountain. The higher elevation of the east end may be a factor, however they are found distributed throughout the Canadian Zone. From government point to Posey Lake a distance of 43.2 miles the Citellus l. lateralis were found on an average of ~~58~~ 58+ to a mile while from Government Point to Torrey a distance of 30 miles (approx) they were found on an average of 16+ to a mile. The longest stretch lacking Citellus was. 10.4 miles while the closet association other than when seen in pairs was less than 1 block apart. The Eutamias ranged lower than the Citellus. 7 were seen in all. This above observation I record is possibly the minimum number to be seen on trip of this kind because driving and looking at panorama below required important time that should be devoted to a more careful scrutiny for the mammal forms.

7/24/38.

Recorded the calls of Citellus armatus from Stewarts Cascade on Mt. Timpanogos to M. T. A. Home. Included all calls whether duplicate or not. 30 minutes in field. and walk along at a normal gate.



The graph pattern definitely corresponds to the shape of the canyon. The widest portion supporting the greatest number of citellus. Canyon pattern included for comparison with graph.



Total of 116 calls

One particularly small citellus armatus was 5" long and appeared to fearless. It walked around the base of one of the bushes near creek and appeared to have weak eyes when examined closely and from its action while in movement: Family of Water Ouzels at falls and as large as parent but still being fed by old birds. At a point on main road directly north of M.I.A. Home collected a small grass snake; Leopeltis vernalis on road and had been run over by car. It was about 7 inches long and in good condition. Turned it over to Elmer Tanner. On road down north fork found the chokecherries still green and not fully developed while in comparison with the tree at home in Provo are overripe and about all fallen from stems. Nest no. 4 of observation on the 10th of July at M.I.A. Home in main canyon held 2 young birds in nest, estimated to be four or 5 days old. This would indicate that not all hummers start nesting at some time.

7/24/38

Mr. Wolfinden reports that the Golden Eagle nested and successfully raised two young birds at Wildwood in Provo Canyon. The nest is place in cliffs on south side of canyon about 1/3 distance up mountain side. In canyon below at Wildwood there is located many summer homes and a concession at main road that draws hundreds of people on Sundays and Holidays, so the human influence is of considerable concern. The cliff has a flag pole marker on top and is no doubt visited many times during the nesting season. He reports that they left the nest on the 21st of July and were barely able to fly. The nest proper receives about 1 hour of sun shine during the morning. On one occasion an adult bird was seen to have been carrying a large Western white tail rabbit through the air. This is a very unusual nesting site considering its nearness to a center of population. Mr. Wolfinden is a very careful observer and do not doubt his ability in identifying an eagle. Have never found any of his observations, as yet, to be erroneous.

7/25/38

While Dad and I were fishing 1/2 mile above new Deer Creek dam Construction saw one sage hen near river in artemisia 50' from river. It was evidently coming down to water. The hillsides are typical

sagehen country and are covered with Artemisia. About six oclock in the evening.

7/26/38

While fishing in South Fork of Provo Canyon above Vivian Park recorded a Sciurus h. ventorum, one citellus grammurus utahensis, one Marmota, and one water ouzel. all on creek edge and 1/2 mile from where creek enters main Provo River. or about 1/2 way between old fish hatchery and Vivian Park. Caught 12 fish this trip and only fished 1/2 mile of creek.

7/27/38

Spent the day at Red cut at Five mile pass on the west side of Cedar Valley. Road to Lehi with Bennett and caught a few rides over to red-cut. While passing through Lehi saw 52 English Sparrows feeding in road at Ball Park Left Lehi at 1:30 P.M and road part way with young fellow returning from town after taking load of wheat from dry farm; then Mr. Brown took me to road leading to Mercur. Arrived there at 3:00 P.M. Red-tail soaring above the sagebrush flats and Raven calling. From this point took 30" to cut at normal walk. Across flats saw flock of horned Larks these being 30 in number. The petraglyphs of the deer and intricate drawings were about 100' above the railroad cut. The hill side here is barren of large trees at present and dotted with large sandstone boulders. Many of these larger boulders are favorable for petroglyphic recording but were not used, the source quite far from being exhausted. The drawings extend from the top of the hill down to the base near the present road site. The cut made by the railroad has undoubt destroyed several of the picture rocks. From this point can see all of cedar valley, higher peaks of the Wasatch and a short distance up 5 mile pass but cannot see any portion of lake. At Fairfield, on return trip at 5:30 observed 2,000 barn swallows (?) with high percentage of young ones on utility lines. The lines run east and then South and the birds sitting on these wires were all facing same direction without an exception. Those on the east-west line facing north; while those on the S. N trending lines faced east. Wind blowing from the north. The Arkansas Kingbird (?) had two young which followed it around and calling for food. at Fairfield. Two raven flew over calling. Redtail flying over sage flats. Four species

and possibly five were identified while walking along road on this over to cut earlier this afternoon. These hoppers were associated with dry farms and found dead on the road being killed by passing cars. The sides of the road harbored hundreds but few were on road surface proper. Those found on road were nearly always found by the side of the dead ones and generally found with same species. In nearly 99 cases out of 100, whenever a grasshopper left dead brother for a short flight or hop, a small fly (Paragetia sarcophagid) would dart at it from some where and follow it to where it would land. One of the hoppers was green, one with conspicuous black & yellow stripes on thorax, one dusky and plain and large, and one similar but smaller in size.

7/31/38.

Harold Hutchings and myself visited Dr. Tanner at Aspen Grove via of motorcycle. Harold handled the cycle in a masterly manner. To travel by open motorcycle is no-doubt the best way to see the canyon and to feel the canyon breezes and insects!

8/8/38

With Dad on Project at Farmington Bay. Watched the Wilson Phalarope feeding in water belly high. Checked on the number of insects picked up by birds in among the closely feeding group and those birds more isolated from main congregation. The idea being to find out just why they have a tendency to form compact groups while feeding. If the birds in mass formation stir up more insects than the isolated birds, the counts of insect catch per minute should be significant.

Isolated phalarope	In mass group
43 insects per minute	41 insects per minute
51	45
35	40
35	43
44	44
36	43
33	60
33	44
41	55
46	50
10) 397 (39.7 insects per minute	10) 455 (45.5 insects per minute

Would appear that those birds feeding in formation collect .127% more insects as a group than when feeding alone. Those birds feeding together appeared to be more on the alert than the isolated one because of the many insects invading from all direction

from the continually stirred up surrounding water by the companion feeders. No leader tendencies were observed. Counted 174 Brewster Egret at one time in New State Duck Club and contigent areas. It was also noticed that the avocet and ibis also had this same tendency as noted above of feeding in formation. The avocet procedure was particularly interesting. Seven birds formed a more or less broken line front and fed up and down a narrow connection between two divisions of the New State ponds. Their procedure indicated purely that they were after larger prey such as crustaceans and small fish. The water was about 3 inches or 4 deep and with the head or at least bill and part of head under water would walk steadily forward and by swinging head & bill back and forth under water with head turned at each portion finally and by chance pick up its prey. Occasionally they would crouch on legs and nearly submerge entire body. When head was lowered a few tertiary feather became slightly elevated above the otherwise smooth back. This hunting procedure was very systematic in its method but depended entirely upon chance of a fish entering the open submerged bill while being swung back and forth beneath the surface of the shallow water. This acts was participated by single individuals and by groups of individuals of seven or eight in mass formation. The period of about 1 hr. during which I observed the phalarope these birds were continually passing by at 20' and after working down course 100 would return to again about face and execute their hunting tactics once again. Watched 80 Brewster Egrets congregated within 100' of each other or in an area 100' square. with white face ibis feeding in mass formation among them. One thing of interest observed was the repelton of members of the same species but toleration of unlike species. This is so frequently the case in animal life. The ibis would feed among resting egrets and even brush around them and entirely surround without any antagonistic tendency expressed by egret but let one egret approach another and the fireworks began. which resulted in a ruffled neck and regular cock fight. No two egret were found associated in juxtaposition so to speak but comfortably dotting the water surface among

the congregation. Whenever one egret would pick up any article of food from water their was always near at hand some old mole bird close at hand who would soon regain morsel by force with extended breast & head feathers, or take control of new position & investigate by forcing boat ahead with vigorous jerks. The head feathers, neck & back there very rapidly raised at the first sign of repetion.
The female black Crowned heron created as much confusion to the coot as a hawk and whenever one waved fly by the coot would hurriedly run over the water & mud surface to the protection of the rush growth. When on the ground with coot received an unwelcome visit. Also saw to-day a family of four young Pied billed Grebe and adult in accompany. The highly colored red & yellow heads were interesting to look at; one young about same size as family of young was found alone on other side of dike. The ~~dike~~ lake had been nearly drained and the adult bird had evidently taken all young except this one to other side of dike in borrow pit. Several young pintail & coot were effected by Botulinus bacteria.

8/12/38

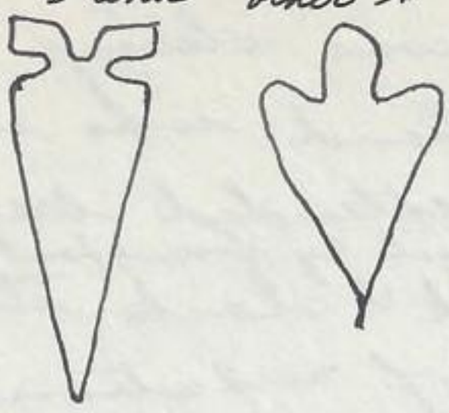
Recorded 5 Citellus grammurus utahensis, 1 Eutamias dorsalis utahensis at Glen Canyon Park between Nunns and Springdell in Provo Canyon. For about 1½ hour in morning a citellus called continuously from hillside

8/14/38

made trip over to Indian Sand Knolls north of Alberta and S.W. of Goshen Bay. Observed 30 Am. Pelicans on south end of lake east of Lincoln Beach, feeding among the tamarix. From Lincoln Beach travelled six miles along west side of West mountain and recorded the following birds: 10 pelicans feeding and swimming along shore line. five Great Blue Heron standing singularly on shore line. They would leave when car passed one block away, eight Ibis, one cormorant flew up from shore line. eight western Grebe in pairs or three swimming near shore. At cave at lincoln beach inspected excavation work of B.Y.U under Reagan. Found two points and a few black pottery sherds, also muskrat jaws

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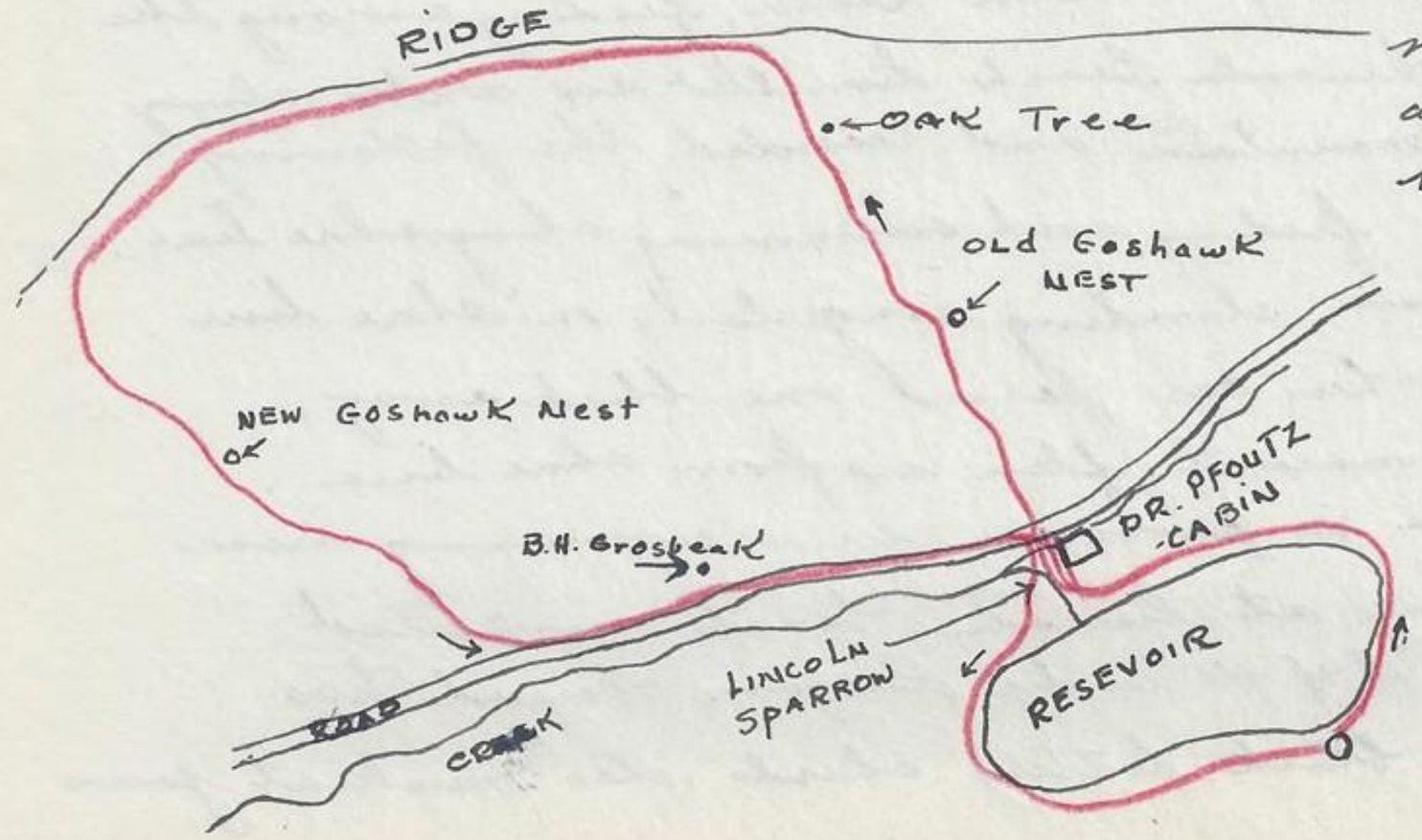
fish jaws ← and other → small bone fragments. Points of this type



Collected petraglyph imprints from rocks on promontory. At sand knolls vicinity 100' from old lake shore bed about 2 miles below dunes. saw seven Curlew feeding together in sage flat. The ground surface in this area is hard and cracked from road to lake bed. At 6:00 P.M counted 12 nighthawks feeding 20' above ground in a measured mile course. Sixteen Jacks were seen in area. On Indian knolls saw cottontail feeding in larger sage & Chrysothamnus growth on knolls. The Lark Sparrows were the most common bird seen alongside of road from Lincoln Beach to Indian Sand Knolls, particularly common on west side of West Mountain. At Lincoln Beach a Ferruginous rough leg passed on boulder near road. a Raven followed mil and I while working down the promontory point from the Provo Level. It cheked and cawed frequently for 4 minutes keeping about 25' over head at all times. Sight on rock at 40'. The four petraglyphs collected were; mt sheep from ledge 20' below uppermost cave and was associated with another irregular shaped one. Eagle (?) from flat rock on Provo Level below cave. Snake (?) 4 blocks north of cave on flat rock on Provo level. Mt. Sheep Provo level below cave.

8/17/38

Payson Canyon and reservoir. From reservoir took trip to ~~east~~ ridge. Follow trail east from Pfoutz cabin to ridge, hence north to a point near divide of Payson and Birdseye Canyon, hence to road and back to car on S. W. end of lake. measured oak tree near ridge and found to be 18 inches in diameter 3 feet from base of tree. The trees here are predominately



aspen with oak, maple, fir mixed among them.

Birds and mammals seen. Observations from 4:30 P.M to 7:00 P.M

Goshawk. Examined old nest near Pfaulz cabin but found unoccupied. First observed Goshawk at north end of ridge near divide. It was in the air and continually darting and diving at a pound dark Swainson hawk (?) 150' above the open meadow. After about the fifth attempt at diving and vigorously calling another lighter colored Swainson arrived upon the scene whereupon the goshawk left and flew straight north over ridge. The hawks remained in air and circled above. 400' south of this open field where aerial exhibit had taken place, located nest of Goshawk in stand of aspen. Located 4 minutes after air circus performance. When about 40' a goshawk flew from vicinity of nest into large Abies concolor 100' to the south. The nest was placed 45' in aspen 10' down from top of tree foliage. Abies concolor were found interspersed among the aspen on gently sloping hillside. a few Shadberries were found along spring running below tree. For four or five minutes it flew from the top of the Abies concolor to the south to another one 100' to the north. and kept this act up with resentful calling screems. After 5 minutes it flew to fir 300' away and remained quiet for 4 minutes the returned to nest to revived calling. On three occasions a Sharp-shinned Hawk attacked the goshawk in the air while flying from one conifer to the other. and at one time while perched in Abies concolor. Only one adult bird at nest. Nest held 2 young 3/4 size of adult. When tree was hit with club they peered over edge and called like parent bird but in a higher tone. Numerous excrement patches located in radius of 10' from nesting tree.

Lincoln Sparrow One chipping like Junco from willow tree 100' below outlet of Payson reservoir. Ideal nesting habitat prevailed with boggy ground about the willow clumps.

Chipping Sparrow. One family (?) of six were feeding in open field near top of ridge among the balsam root like plants. They remained in field while aerial circus took place but when approached within 50' they flew up into aspen 15' away on edge of field. Others were seen in

in aspen stand north of reservoir. They confined their feeding activity to lower bushes and undergrowth. A few were seen in road bordered by aspen near lake shore.

Black Headed Grosbeak. Nest with one young about 2/5 grown. Nest usual and fragile and six feet above ground in chokecherry among aspen. Nest 20' from road and creek bed. The ♀ left at 25' on approach and flew 50' away to limb of aspen. Did not call when near nest or approach when handling young one.

Rana fpiens. Several large ones by Pfautz cabin in marsh below reservoir.

Audubon warbler. Several were seen, one near lake. They confined their feeding to the upper limits of the aspen foliage in aspen stands.

Robin. Feeding among leaves in aspen trees.

Gray-headed Juncos. Watched one group of 7 or 8 birds feeding in aspens at north end of lake. Several young birds in group. They chipped vigorously.

Spotted Sandpiper. Four or five on lake. Two favored one particular spot on lake shore. Two sandpipers fed with two Chipping Sparrows and 2 Juncos within 30' of shore line in open situation but near aspen edge.

Thrush (Sp.?) Did not hear but saw several birds

Mule Deer. One standing in water at edge of lake. Lake west of Payson reservoir. Drove car on other side-on road 200' away without deer leaving water. It appeared to be drinking 1/2 inch tadpoles in this lake but scarce in Payson reservoir.

Purple Martin. Flew by lake at 7:00 and was seen at lower lake west of reservoir. Appeared to be feeding in the air.

The upper end of the lower lake west of Payson reservoir appears to me to be an ideal trapping habitat for muskrats and sorex where the springs issue and are bordered by willows and rank flower growths. The dormant tree surrounding open field being aspen. At this area found the Lincoln Sparrow, nest of spotted sandpiper with four eggs, Red naped sapsucker and House Wren. The phalarope nest was placed in short grasses near willow and creek but 150' from lake edge. Salamander, Pseudacris and a small bufo were found here. The Pseudacris were in damp areas but 100' from lake edge.

made three day pack trip on the north end of mt. Timpanogos with camping outfit on back, depending on nothing that could not be carried in baffle bag. Bob. Newell accompanied. The objective of this three day trip was to check upon the late summer birds and particularly the Citellus armatus and other mammals. The itinerary being from mouth to head of Grove Creek, hence north to divide then east across head of burned canyon, Rock canyon cirque, mill canyon, Bear canyon and hence down bear canyon to Mutual Dell. Satisfactory menu used:

Prepared Supper:
Breakfast: Eggs (2), bacon, potatoes, cocoa, toast,
Lunch: chocolate square, energy ball, 1/2 lb of cheese, peanuts, raisins.
Supper: Stew of potatoes, carrots, meat, onions, desert of prune, cookies, apple, pudding, raisins
Breakfast: Eggs (2), bacon, potatoes, last nights desert, cocoa, toast.
Lunch: Emergency rations and campbells chicken noodle soup cookies
Lemonade on trail as body so desired.
(note) Boil potatoes at home except one for stew.
Energy balls are always in demand.

Rev. Erwin drove us over to mouth of Pleasant Grove Creek to erosional control dam. Soon had packs adjusted and on trail at 1:40 P.M. The day was very warm and the sun bore down heavily from the clear blue skies overhead.

1:43 At lower end of canyon heard a Eutamias and was probably a dorsalis utahensis. A lizard (Sceloporus) ran from trail into brush on side of hill.

1:46 Observed two citellus grammurus utahensis and their actions and activity were so interesting that we paused for about 10 minutes to record the preformance. The flora we are now viewing consists of 15' high squaw bush bordering the dry rocky and highly erosional creek bed and a few small cottonwood trees. The main valley floor of this canyon is limited being about 115' across and ~~being~~ occupied mainly by the creek bed. The remaining portion of valley is occupied by artemesia. Extensive rock slides cover the north hillside exposure originating from the horizontal line of highly fractured cliffs some 250' above the valley floor. Above these cliffs are found cliff rose and mahogany while below and filling in the areas not supporting slides are small oak bushes. The south side of the canyon lacks the extensive hot rock slides and is blessed with a better growth of scrub oak. The immediate growth to creek is tall and in good condition but beyond the limits not directly effected by the creek proper the growth is experiencing a more difficult time in gaining their maximum growth possibilities. It was on the south side of the canyon in an oak grove in floor of canyon that we chanced to observed the late summer feeding habits of the citellus g. utahensis. Thought that only

being 60' from them they would resent our presence and not carry on their normal manner of feeding but was surprised to find that they disregarded us and continued in same style as when first observed. This close proximity was not as usually experienced because I have been in same canyon at same point several times earlier in season and the first attempts the cetellus preformed were to scale the rock ledge and run up mt. side out of site. Spent a few day collecting these forms or at least tried to collect them but never found them within gun range. Several other factors may enter into this problem besides the feeding influence that at present was certainly controlling their fearlessness. The canyon is located near the town and possible the human depredation has been less during recent months. however I am of the opinion that the fall food storage period is responsible. When first observed two squirrels were seen in upper branches of an oak tree 12' from the ground. They were feeding upon the acorns at the terminal of the branch. Was surprised to see how adeptly they fed through the green foliage from one branch to another, very much in the same manner as a Tamiasciurus would search among the trees. When not able to reach an adjoining branch would retrace limb to main trunk and then run up or down until a lateral branch led out to foliage at the perepheral edge of tree outline. They preformed their act with a great deal of agility and grace and the only criterion that pointed definitely to the fact that they were not naturally at home in the tree tops was the occasional awkward flip of the tail either to the side or straight up in attempt to regain balance. After feeding until their cheeks and throat appeared to be more than pack one left tree and ran up over ledge to brink of cliff where it disappeared among the vegetation. I could see that it did not go beyond top of cliff and assumed that it probably had hole their and had deposited its cache of acorns. In examining the bases of the oak trees found that they were carpeted with shelled and worm eaten acorns. The worm eaten nuts in many cases had only the imprints of the cetellus teeth. It seems quite remarkable that these squirrels can tell the wormy acorns from the good ones by merely forcing their incisor teeth into them. Out of 10 whole acorns examined 10 were found wormy while hundreds of shells indicated that the perfect ones had been used to cache away or eaten. Leaving this observation point commenced our trip up hat trail at 1:52.

1:53 A woodhouse jay flew across canyon and calling while another at point of its destination responded to its call. Found

it be possible that this bird could have determined its own species 300' away by sight or actions alone? The way in which a woodhouse drops into an oak patch is very characteristic. While making the above observation a Spurred Towhee left a point about 200 up hillside and flew or dropped deagonally down mt. side and lit in oak patch in bottom of canyon. Rock wren calling among cliffs in canyon.

1:55 Eutamias calling and probably dorsalis utahensis. Another Citellus grammurus utahensis fed in small oak bush on north side of canyon 150' from first two observed. She watched it at 40'. Sparrow hawk lit in cliff rose near cliff on north side of canyon.

2:00 Citellus g. ut.

2:05 Scelophorus. now at top of steep grade at abandoned mine. The mouth proper of draw appeared to be much alive with animal life particularly the citellus. Was surprised to not find more Sceloporus at this area just covered when compared with the number found just beyond.

2:08 Scelophorus climbed trail bank and caused considerable dirt to roll down. If this is repeated several times a day for several week their will be a noticeable amount of debris upon the side of the trail.

2:10 Three Scelophorus inhabiting the top of the new face cut into side of mountain for trail.

2:11 One Scelophorus. Ibid.

2:12 National Forest Boundary and game preserve line.

2:14 2 Citellus g utahensis feeding on acorns among the oak trees on hillside. Watched at 18 feet. Spurred Towhee and Sceloporus at this point. At first scratch back in trail just beyond boundary line recorded vegetation types. The birch was the dominant tree along edge of beautiful flowing creek. and while it controlled the situation, at least on south side, the oak and maple invaded on the north side. The minor bushes like the chokecherry, Rose, and willow play their part in establishing a good undergrowth. This growth is directly influenced by the stream proper and beyond its limits on the confining side hill the type of vegetation changes to the scrub oak, cliff rose and artemesia - chrysothamnus associations. Just a short distance up this canyon one find several springs about 100' up north hillside that are isolated spots of green, rank and taller growth as compared to ordinary hillside surface. And just a little further up canyon one finds the first extensive patches of Abis concolor.. I believe this area is the lowest point on mountain supporting the white fir trees and is connected with trees of higher elevations without intervening barriers. Leaving this switchback at 2:30 P.M and starting up graded trail to the west. A few clouds now help protect us from the tortering sunshine.

2:30 Sclophorus along trail. The Salenda pertifer is revegetating the new cuts of the trail particularly on slaping just over edge of trail. Maple, squawbush, oak, chrysothamnus and shadescale on sunny hillside. As one approaches the west exposure of mountain the shadescale increases in number. Red-tail Hawk screaming on other side of canyon just above the nesting cliffs which are noticeably cavernous. Two Hoodhawk jays flew up hillside. Sceloporus on trail.

2:45 Switchback and now trending east along well graded trail. Now two red-tails can be seen high in air above same cliffs and one is being attacked by Sparrow Hawk (?) From this point on west exposure of mountain to first spring water crossing trail observed two Spurred Towhee, 2 Sceloporus and several sets of citellus g. u. tracks along trail. One of the Towhees was singing.

3:45 Arrived at spring but found bed dry of running water but damp which would indicate that water had just recently stopped flowing down hillside or possible a rain storm could have caused damp condition. However the masses were just beginning to die. The first point on trail below spring, after crossing assorted rock slide has some interesting calcite crystals on rocks at trail edge. At 3:48 and about 100' east of where spring water normally crosses trail saw a Eutamias dorsalis letalensis on an oak tree associated with Chokecherry and service berry. From this point one can see the two eagle cliffs on skyline to the south and also the extent of conifers.

4:18 At the third Pinus monophylus. This conifer is exceptionally rare along trail and know of just three small ones

4:42. Cross-over. Trail crosses creek for first time.

5:10 Camp at head of Canyon at old camp site among the conifers at edge of main creek. The Canyon proper now becomes extinct and is replaced by broad open country. Just as we got tent erected it began to sprinkle and lasted for about 25 minutes. By the time we were ready for bed at 9:00 P.M. the skies were clear again and stars shown brightly. Before the sun had set viewed the top of Timp at the demarcation of strata after the rain had dampened the rocks & cliffs. The light strata became lighter while the darker levels were brought into a more definite contrast. Slept well in 4 lb. bag with tent covers partly open.

Next morning. 8/25/38

up at 5:30 A.M and by 7:00 were packed and on trail. Sun not as yet at camp. During the preparation of breakfast did not hear the familiar song of the Hermit

Thrush or other birds generally heard here in song during the spring season. Left with the Magellaway Warbler (?) singing at camp. As we worked up trail to the east heard Utah Jay and Juncs calling. The Jay flew from tree to tree offering its calls while the Juncs flew up from feeding among weeds near trail. The gophers were active with many fresh mounds made since rain last night at head of stream at left of trail flushed a Dusky grouse. The tail feathers, except 2 or 3. had been pulled out but regardless of this hindrance seemed to navigate in usual manner. This spring is supported a good flow of water and has very cold temperature We arrived here at 7:17. Before getting to far from the immediate environs of our last night camp I made comment upon the present cattle depredations. This area has suffered more than other sections of the range because of the congestion of animals at this point. It is quite evident that a consistant number of cattle will do no particular harm to the range but here where the numbers are far to great per unit area of range, the shear trampling effect upon the vegetation is noticeable. The greatest harm arrives from natural animal and domesticated animal contact. Would be suggestable to reduced numbers, at least prevent congestion at certain points.

7:37. Chipping sparrow flew from field into aspen tree. Arriving at more open fields and find a very interesting association ~~between~~ on the open hillsides. These rolling hills represent successions of terminal moraines. The large oaks, aspen and maple are lacking but the areas supports, in certain areas, a good growth of Symphoricarpus with white berry, Artemisia tridentata, mint and grasses. In the first favorable patch observed an unusual number of birds and mammals. The area seemed to be more alive in contrast the trail route through aspens which we had just past through. At this area observed 4 umbrinus, nine green-tail Towhee, flock of 20 sparrows (? Sp.) but looked much like Brewers, 4 chipping sparrows. The Eutamias umbrinus were among symphoricarpus and in low oak trees at edge. The Towhees flew from one area to the other in two or threes but not as one large flock and did not appear to be so fearful of our presence as experienced during other seasons of the year. On approaching this area a red-tail was seen on lone oak on top of terminal moraine as we approached it called but still remained on limb, however when too near it flew. Time 7:45. At 8:50 paused at a vantage point and recorded negligible change from summer

380825-268

to fall. There is no sign of autumn except the dry grasses that are wiped in among the artemisia and Symphoricarpus and certain brown patches of low brush or weed on east side of Mahogany ridge. The east side of Mahogany ridge has Abies concolor and probably Pseudotsuga on the upper half of exposure. Aspen, mahogany and oak are found on top while below line of conifers is found brush down to canyon floor where the aspen again become dominant. On several horizontal shelfs are small patches of aspen. While watching from this point observed an Eutamias inbrinus on top of oak tree only a short distance away. It was on upper most branch and called vigorously. At very sharp call the tail flipped over back with a quick jerk. When these inbrinus are approached they leave tree and scurry up through brush.

8:25 Six Green. tail Towhees in loose flock working along side hill. Up to this point have not seen any evidence of Citellus armatus while on the trip of 5/21/38 recorded many citellus from these open flats.

8:26 Three Grey headed Juncos, 2 G. Tail. Towhee and 4 Chipping Sparrow. Have not been able to record all birds nor recognize many of the varied calls heard.
Flock of Pine siskin flew by. Slender calling

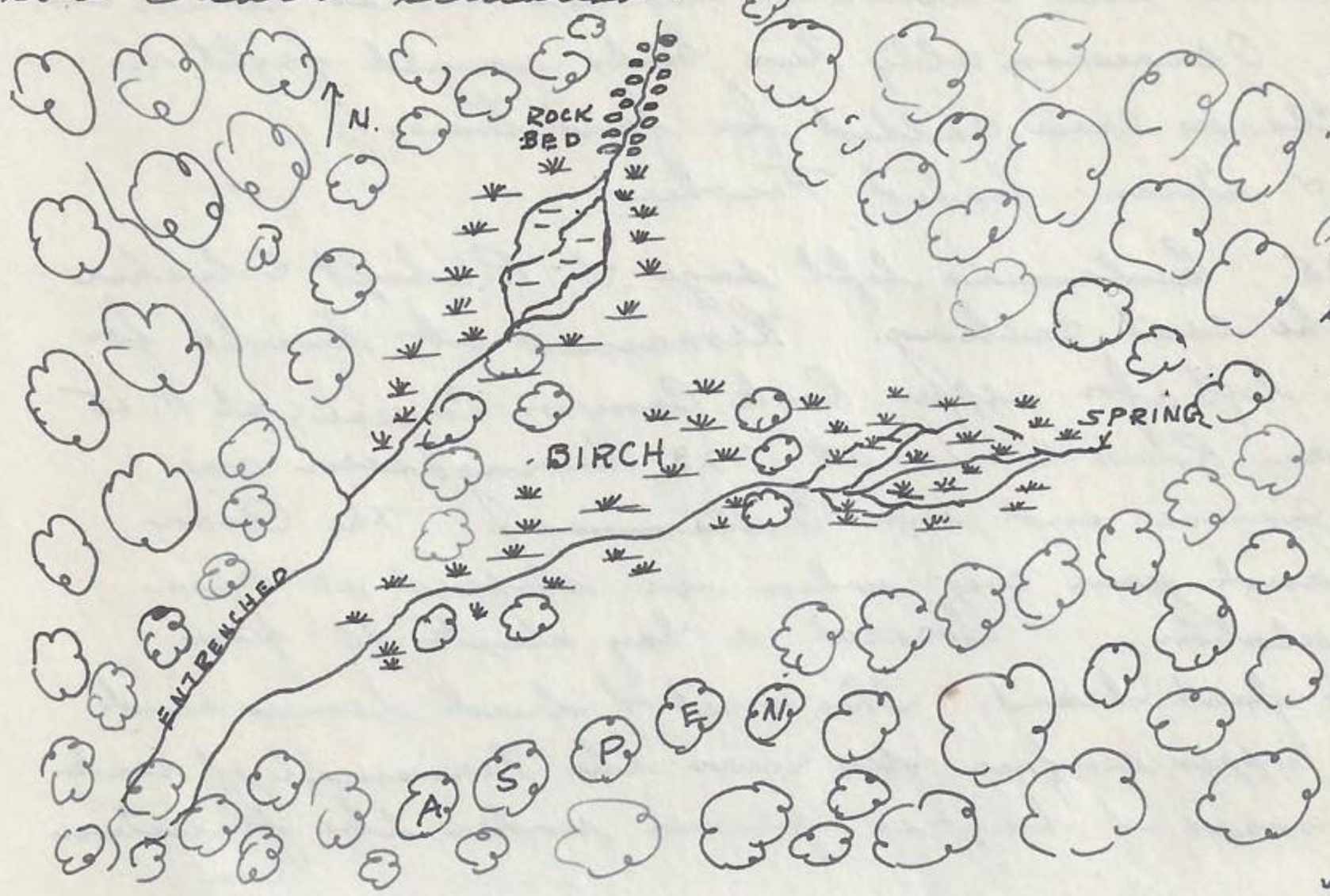
8:27 Four siskin flew by. Three G.H. Juncos flew from aspen to aspen calling continuously. Two sets of fresh deer tracks in trail and probably made sometime this morning.

8:31 Run into flock of about 1,500 Pine siskin among the aspen covered hillside in terminal moraine area. One flock of 600 was chasing a red. tail hawk that was flying above the resting area of siskin. This flock did not appear to actually attack the circling hawk but ~~flew~~ followed it in its spiral ascent. With circling & circling in mass formation they followed it until out of range whereupon they all left simultaneously and returned to chatter with other members of one larger flock in aspen. The area covered by these siskin was about one acre in extent with the tree tops literly leaved with them. The most favorate places were the tall dead aspen where flocks of 50 or a hundred would gather and register their social calls. To preen their feathers or chase each other appeared to be their favorite pastime. There was always considerable movement among the flock and the most apparent feature was the continuous chatter produced by the thousands of calls. Practically all birds conformed to upper green branches of aspen trees. Their calls were two in numbers; one a drawn out call while the other a drawn normal siskin chirp. Near this area was a

clearing of negro-heads 4 feet high and thickly covering the ground. Two red-tail now at scene if seeking but no response from small birds

8:45 G.T. Towhee, 2 And. Warblers chipping in aspen.

8:55 Arrived at spring among aspen trees, being first water after leaving spring at camp this morning. Grass and willows line the springy area with small meadow ~~below~~ at base of hill where spring camp down. Two immature R. Nape. Sapsuckers fed in willow. Approached with 8' before they finally flew. They were feeding upon the bark of the willow and remained close together. -no adult in sight. The next spring visited beyond and on same trail is in a more cleared situation:



Failed to observe any migrants but from general appearance am sure would support a few. The spring to the right is a mound type and is built up above the surrounding area. A few buck and nat willow are found in center of area. Leaving spring and still trending to the north arrived at the Government constructed spring and trough in open flat below divide at 9:50. A robin, 4 G.T. Towhees, and 4 Juncos were seen between last spring & Government spring. From the spring watched two golden eagles feeding along the west exposure of Sunapaugoe and about 1/5 the distant up mountain from our elevation. One flew just above the ground on hillside while the other bird flew higher and followed closely behind. The feeding procedure would be to fly south along side hill for about 5 blocks then return back to starting position at a higher elevation from surface of ground and then follow over same course about 15' above ground. I suspicion that the bird that followed and remained at a higher elevation was probably an

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immature → bird which → was following the adult bird.
The terrain covered was small scrub aspen trees, open meadows and slide rock tracts, limited above by cliffs and below by fir and larger aspen groves. Have seen an eagle fly over this identical course 2 years ago in early spring. Two juncos sat on top of tree near spring and sang. Left at 10:30 with skies clear and bearing east over flats to trail leading up over divide into the American Fork canyon. Two G.H. Juncos and several smaller birds flew up from among the negro-heads. Near divide watch family of red-tail on fir knoll at left of divide. They favored this point and returned several times while we watched them: Occasionally two birds would fight in mid-air. Clarks Crow called for first time.

10:30 Juncos & Green-tailed Towhee.

Divide at 10:35. Eutamias left sage. & R. Shoft Thicher flew by to the east calling. Remained at divide for short stop then left for upper Rock Canyon Cirque. at 11:15 arrived at Pika Rock Slide at 11:23, having seen one G.T. Towhee, 2 Juncos and one Eutamias & The Pika was at home and gave cry when we stopped at base of rock accumulation. Located a hay stack 80' from where Pika was first heard. The nest of dried leaves and stems is on the upper surface see near the terminal of rock slide. The mass of hay is placed under the protection



1-8-25-38



2-8-25-38

of a fir log. The stump proper is hollow with about 1/3 of circumference torn away thereby allowing a beautiful storage chamber of about 1 bushel capacity and throughly protected from the elements except for a part of one side exposure. The log was turned over to





show the accumulation of dried Artemisia leaves and stems, dried yarrow stems, flowers and leaves, dried gooseberry leaves but no gooseberries, raspberry leaves, and many other unidentifiable plants & stems.
All plants were a faded green and not dessicated and were compared with plants bordering slide area. The interesting feature about this food chamber was the fact that it was isolated from the area where Pika were first observed and that it was placed in an area where underground passages and larger rocks were lacking. There was no connection with any subterranian channels. In this case the Ochotona had been governed by available shelter and was not influenced in his choice by convenience to suitable rock slide or (underground passages. At the base of the slide is a nice patch of hairy gooseberries. Bordering the slide is aspen & fir trees on N. & W. side Artemisia on west side. The snow slide area continues to the west with scrubby aspen, chokecherry etc. Associated with this pika was one Citellus armatus (first one observed on trip) which ran into base of rock slide 30' from where Ochotoma was first observed. It looked fat and in fine fur condition! One Eutamias ran across slide. Two Tamiasciurus called in fire nearby. When running across slide was agile and very active, dodging in among rock but always near top. Left slide 11:58 A.M. and continued along trail. Between here & camp at pond recorded 4 Tamiasciurus and set of fresh deer tracks. Arrived at camp site at Imprisoned Lake at ~~4:30~~ 1:00 P.M. Spent the afternoon developing spring and by 4:30 had stew on fire. The spring was in a bad shape because the cattle had tramped it into a mass of knee deep mud. The only hope of getting water would be to locate, as near as possible, the source and then excavate through mud to base & line with stones. After digging a deep channel from new well were able to get sufficient water for our use, about 1 cup in 60 seconds. The lake created by this flow of spring water is elongate oval in outline and is impounded as far as the outlet is concerned. Lemna completely covered the surface of the water and no vegetation bordered shore lines. Numerous Amblystoma tigrinum were found within the water. Springtails from the N. W. end of pond. Temperature 6:00 = 57°F Dark rain clouds above. Toward evening a great Horned owl arrived and sat on dead limb about lake. Thrush responded to his presence.

Stepped out to point north of camp at sundown but did not see any deer feeding on sidehills. From this point one receives a very impressive view of the north end of Tintic and Rock Canyon Argue. From here west west and out on point at end of ridge leading down from main N.S ridge. At this point is found a ~~Symphoricarpus~~ patch. Here the Eutamias m. ~~dorsalbornius~~ were feeding. Frightened a Tamiasciurus from here also among the small bushes in opening. It ran 30' into fir at edge. At several points found the reduced scales of the fir on the ground several feet from conifer tree. and probably the result of the Eutamias. While sitting at the edge of the ridge, overlooking Am. Fork Canyon several Eutamias m. conobrinus passed, some within 4 feet of me. One of their calls is a sharp chirp while another one resembles the call of a breading hen or a variation of the robin call. Generally when found unaware will not offer sharp call until within the protection of the brush. Back to camp and supper over with. Started to rain at 7:20. To continue for several hours. Bed at 7:30 Temperature 7:35 = 48° F During the early part of the evening heard the pair will (?) giving the weird call. Its song is two notes, the last one 1/2 step above first one.

Following morning. 8/26/38

Temperature 48° F at 6:00 A.M.
Temperature 62° F at 9:45 A.M.

After breakfast visited head of a lateral of Burnt Canyon. Many fine springs with good water flowing capacity. Most of these springs issue from a more or less common level. Here the cattle would naturally be congested in too great a number for the good of the land and surrounding areas. On way back to camp observed again the apparently abnormal number of aspen trees that had been uprooted and fallen down. Many were live trees and apparently in good shape. They had fallen in every direction and did not seem to conform with the prevailing winds or on a constant direction that would indicate a heavy wind or storm at one time. The trail from the largest spring bears north to main government trail then east up step ridge of oak and maple to more or less flat aspen covered flats. It joins other main trail a few hundred feet west of ~~Impressoned~~ Lake. The climb out of this canyon is to great to justify stopping overnight when making Olsen Grove, mutual bell trip. Several Tamiasciurus were heard on this morning trip. After packing left at 9:15 A.M and following east on short-cut trail to Cryptomeria rock canyon. Fresh deer tracks and coyote were seen along trail.

at Cirque, just at base of rock slide, located nice spring that appeared to be a permanent one. It is situated at base of largest slide. Six Ochotona were observed on rock above, mainly in larger rocks at base of slide. While we did not make any extensive or systematic search, were unable to find any hay-stack accumulations. The red-service berry, twin berry, willow, aspen, gooseberry and other plants were in reach of pika as a source of food. The trip from cirque to ridge leading down into Bear Canyon disclosed about 8 records of Tamiasciurus. no Kinglets were heard singing. At ridge left packs and visited point to north. There is no trail and the brush offers resistance but finally reaching point were in a better position to answer the question as to why the deer tracks and signs were so prevalent here. Signs of the bear were also noted here, and, so was probably the cone with the deer, man had not been here to interfer with their peace. One receives a nice view here but has no photographic possibilities, at least they are not as good as one would presume they would be. Returned to packs on trail and started down trail to Bear Canyon. The trail passes through aspens and finally enters the best growth of Conifers on the Mountain. It reminds one of the Uintahs. The Pseudotsuga and Abies concolor are found here. Arrived at point on trail were it forks, one going to Tumpoonike Basin and the other continuing north down Canyon to Mutual Dell Just a few hundred feet down trail one comes to large spring. Arrived here at 1:38 P.M for lunch. Spring flowing normally and cold. Good Campsite 100 N. E. after lunch followed trail to Mutual dell and arriving at 2:10 P.M. Were to meet car here, but decided to contact them at Indian Cave about 3 blocks west of fork of American Fork Canyon. The road between Mutual dell and Aspen was under construction, so knew that we could contact car in American Fork Canyon. The trail up from Mutual dell to spring is similar in grade to the Aspen trail leading up into Holden valley. Am anxious to study the conifer forest we visited above and will make approach from Timpanoke Basin trail.

380826-274

about 1/2 way between the junction of the north and south forks of American Fork Canyon, recorded a land slide or slip on the south side of road. The picture shows the degree of slipping and extent of damage to road of canyon and timber land. Other old scars of such an occurrance as this were found on canyon walls but are now revegitated and diff-icult to detect. Am not a bit surprise that shoulder slips as represented here are cause of many of the serious flood, in that these slippings block crick and when supersaturated give away and allow the impounded water to increase carrying capacity many many times. The phenomena here is a natural thing and I do not think that road construction could be included in the cause.



1- 8-26-38

Stopped at Indian cave to check on excavating operations by Geol. Dept of B. Y. University. Lee Stokes under direct-ion of Dr. George Hansen excavated cave. On one of the bone piles picked up upper jaw of bear. Many Ovis jaws & teeth as well as numerous porcupine skulls were seen in bone piles.. On entering cave saw a neotoma cinerea cinerea at entrance. It appeared very tame and allowed us to approach within 3 feet of it. During our entire stay here, this mammal kept in close proximity either at back of cave or along shelves on side walls. While there were several possible retreats and a neotoma nest at front of cave. it did not leave the recesses of the cave. The C.C.C men had done the initial work by trenching back to end of cave where bones were accumulated. The trenched material was piled in a talus slope at edge of cave and one finds the stalagmite accumulations and many bones that were encountered during their digging. Shortly after 5:30 the folks arrived and after showing mother & Dad the cave we left for Provo.

8/28/38 Mr. Walfinden of Lehi sent me a (872 JB)
Nycteris Cinerea Cinerea. While fishing with a fly on the Provo River at Heldwood he caught this bat by the wing in making his cast. Length 139 m.m.
Tail 61 m.m. ♀
Foot 11.5 m.m.
Wing Sp. 416 m.m.

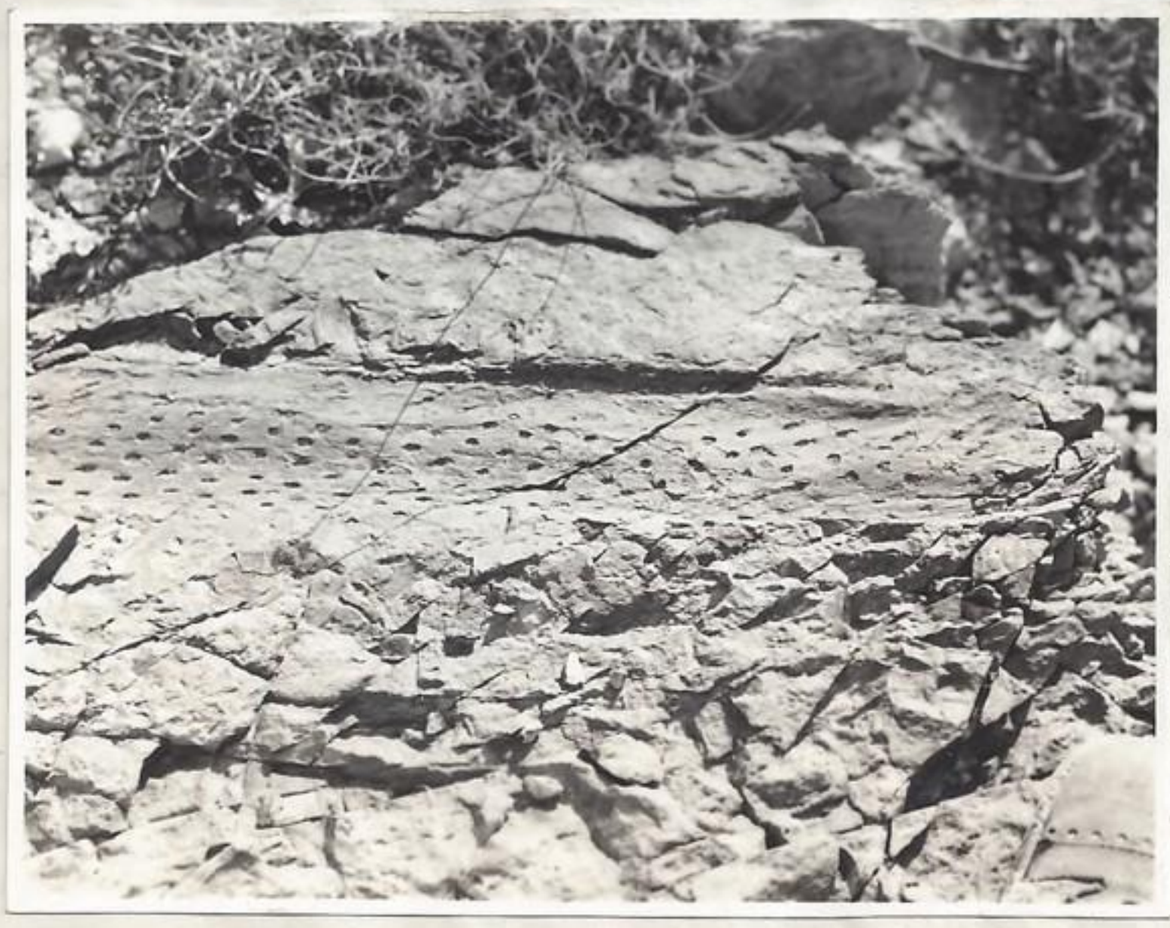
9/4/38 Visited Mr. Miner of Springville. Mrs. Miner has about 20 mink of the eastern species. Their habits are much like the weasel. Two escaped the pens and were about 1/2 hour in getting them back again. To see them sneaking through the weeds with their heads held high gave them the appearance of the weasel. They are very nervous and when being fed jump from nest box to floor in a rythmic manner. Mr. Miner is to receive 10 Chinchilla from Price Utah. He owns one and is to keep the others for a gentleman in Price.

9/6/38 Sight record of Citellus grammurus utahensis at Bridal Veil falls at about 12 oclock noon. Also a sight record at Springdell in Provo Canyon, one at the new Deer Creek Dam now under construction in Provo Canyon; one 2 block up Provo Canyon from Provo Park.

9/3/38 Sight record of two Citellus grammurus utahensis. One at the Provo City Junk pile and another 2 blocks up Slate Canyon. Both observations about noon. On this trip collected two sample of concretions from the tillite formation near first water mine. While chiseling this fossils out of formation on hillside watch a Great Horned Owl fly up Canyon near spring. Following directly behind in close pursuit were 7 magpies & when the owl lit in oak tree the magpies closed in around it. The peculiar thing about the incident is the fact that the magpies did not physically attack the owl but quietly followed it around. In returning home visited the mill race below Air Port. Near Bullocks farm found a Spotted Sandpiper on bank of lateral stream that had been effected by bobkism. In a very awkward manner it found its way to water and when on surface swam freely about. It still retained the characteristic teetering. Other well sp. sandpipers were observed by able to fly. Six mallard & a few pintail were found dead on banks of stream. About 80 muckens were seen in more or

less compact group. Avocet inevidence. In creek just south of City Dis-fort saw a great blue Heron standing at edge of rushes and it remained until I was practically on the opposite side of bank. I could see then that its right foot was malformed with the toes pointing backwards. It let in dusty road way and in examining tracks found the left foot to be normal ⋎ but the right foot leaving a tracking foot mark as in this manner ⫴ indicating that it was walking on recurved digits and dragging toes behind.

9/6/38 Sight record of Otelluss grammurus utahensis about 3 block up new Pole Canyon road in Provo Canyon. Dad & I drove car 1/2 way up new road to divide. Visited the Honor Lake cache in fir trees and found that many of the trees had been cut down this year. The cache, however, was still their but had been taken down out of the trees. Dad photographed several of the Sedydadendron or seal tree fossils at the head of the first large canyon north of the mouth of Rock Canyon. One picture shows the triple faulting of one section of a tree or root. while another shows the scars of either the leaves or rootlets left upon the main trunk or root. There appears to be only one main outcropping of this formation in the vicinity but is traceable to the south at the divide of sheep Flats and divide of Little Rock Canyon and Slate Canyon. The particular stratum is much darker and harder than the limestones associated with it. Probably 40 or 50 trunk sections are represented here. This particular section pictured here represents one of the best preserved specimens located in the area. While not continuous for any great length, the section that is pictured here in in nearly perfect condition. The shoe or rather the toe of the shoe in the lower right hand part of picture will give relatively size of the tree section. One can almost see the ady appearance of the rock texture.





380906-276

General shot showing the faulting systems of the rocks. Fracture mainly on a north, south trend.



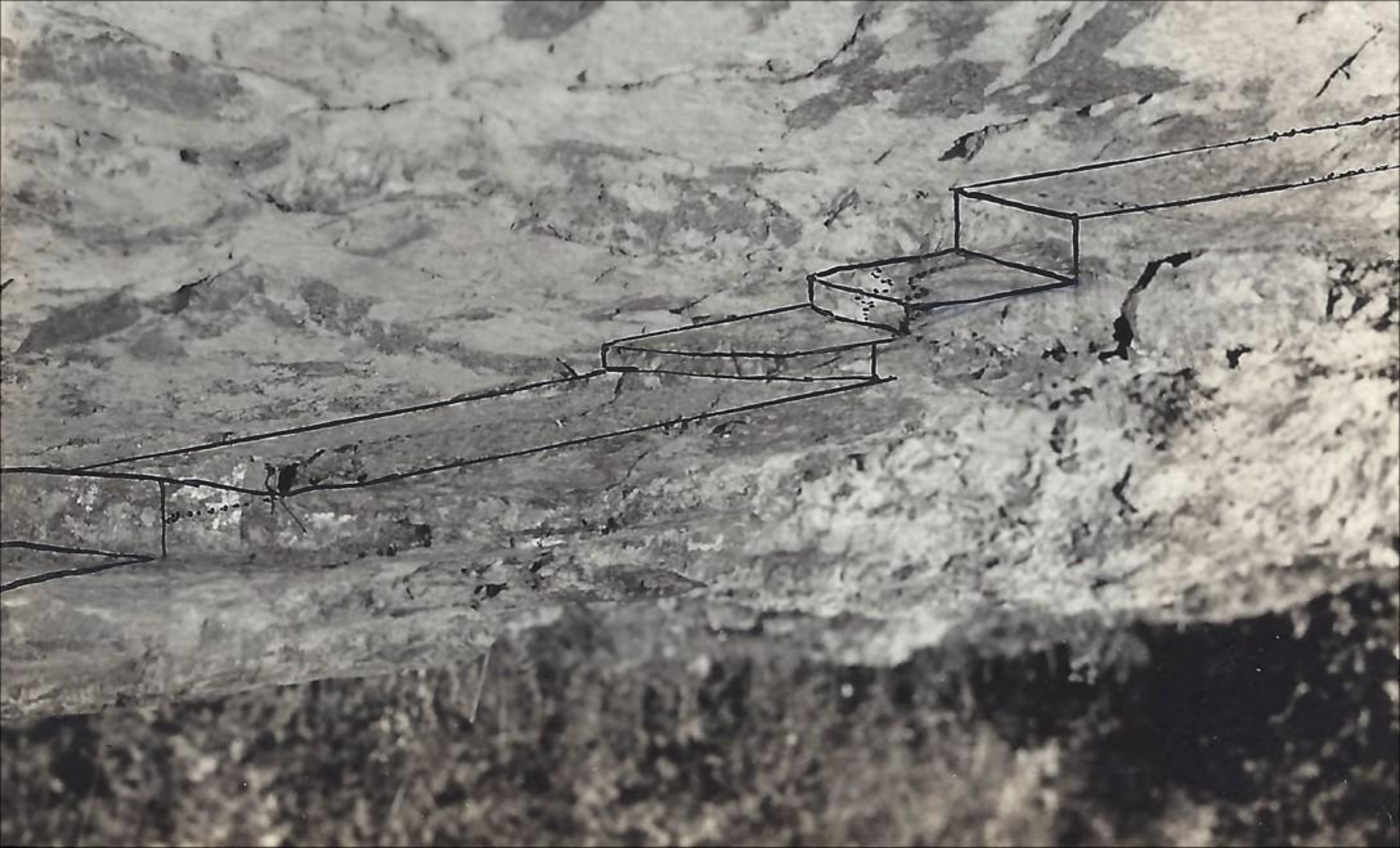
Close-up of one displacement. across a section showing the glossy slickensides



Outcropping of Lepidodendrons Generalized view showing relative position with the last dip of the secondary ridge in the immediate background.



On return trip observed a deer and collected a Phrynosoma douglassi ornatum near Lepidodendron outcropping. On trail found the tail feathers of a Spurred Towhee and associated with this find was a Goshawk about 100 feet away. It may have been possible that this hawk had attacked the Towhee only a few minutes ago. Two Towhees were seen here near scene of tail feathers. The donkey ear plants were dead and one could not help but make considerable noise when walking through them. There has certainly been a remarkable change in the plant growth







since the ship load been removed from the mountain. Instead of the plant stems standing out as skeletons, they now remained with natural foliage. / Certain areas where the open fields are flat the Thomamp have completely turned the sail over in their digging operations. The new road at preient is about 1/2 way to divide.

9/9/38

Dr. Vasco Tanner, Beck, Chandler & I were moving out a cabinet from lower B.Y.U. campus when Dr. Tanner discovered a (873 J.B) Tadarida mexicana in a waste paper basket. It was among the oil soaked sawdust in bottom, sawdust that had been used for cleaning floors. The bat was unable to fly and completely saturated with oil. Could walk and call but unable to fly.

9/9/38

Harry Chandler and myself spent the late afternoon of the 9th and all day of the 10th on mountains east of Provo. Our objective was to collect data on the migrating warblers and to check on mammals and birds in general. Harry was well equipped for insect collecting and planned on sampling areas on way. The itinerary was to include trip up slide canyon to spring at head where we are to camp, inspect that area, then gain Eagle cliffs on top of 'Y' mt. and return to camp. On way back to Provo were planning on visiting or locating the alleged cave in lower slide canyon for bats. Edith Stimpson taxied us to "Y" trail and by 4:55 P.M were at the base of mountain on trail at the highest level of Lake Bonneville. Checked on grasshoppers on first part of trail bordering the bonneville level. Here the cheat grass covers the bat hillside with very little other associated vegetation. Adjacent to this stretch, on the Bonneville level below is the new burnt area. Was interested to determine the extent of migration of these hoppers, if there be any, from the burnt area to the untouched hillside. While walking along trail at slow gait for one minute counted 18 grasshoppers in trail. The count included only those hoppers in trail proper and not on sides in weeds. The 18 in number does not include number of insects per certain area but by counting from trail only, can get a comparative figure from counts further on along in higher elevations.

5:06 P.M. Grasshopper count on trail at normal gait = 10 hopper per minute. This stretch was through scrub oak patch.
5:12 Three small Sceloporus recorded so far.
5:13 Woodhouse flew by and lit in our trail ahead near some oak.
5:14 Grasshopper count. Open situation like first count. 21 in 1 minute.

2. Red breasted Nuthatches
4. Chickadees
3. Audubon warblers
1. Western flycatchers (?)
8. Chipping Sparrows
3. Audubon warblers
1 Nuthatch
1 Tamiasciurus
6 Chickadees
1 Flycatcher (?)
1 Hairy Woodpecker
4 Chickadees

Forks 9:20 after gain divide of left hand fork proceeded up ridge to eagle cliffs. At divide saw Pileolated warbler in willows. On route up ridge recorded the following as observed.

1 Red shafted flick, 2 Sulophorus, 1 Sceloporus, nuthatch, Sulophorus, red tail, 2 clark crows, Townsend Solitaire, Kinglet (sp.?), Mt Chickadee, 2 Western Soalcatchers, 2 nuthatches, Arrival at eagle cliffs. Gilia in blossom. Was quite surprised to find the eagle at the nest when we approached at edge of cliff where we could see nest. After about 15 seconds it left and glided around cliffs to the east and out of view for the present. The nest proper was merely a mat of dry fir needles without the super structure of greener fir bows and sticks. It appeared to me to be only the old structure of lastyears nest and assumed that it had evidently not been used this year. Could not see into the deepest part of plateform because of the over-hanging ledge, but could plainly see that it had not been used this year. A few minutes later we took a position on the east side of the peak and from this station could see the eagle flying below, back and forth across the mountain side. It appeared to be definitely hunting and would fly back and forth across the lower mountain side, among the aspen and abies concolor. If it is a fact that this is a last year nest would probably mean that one of the pair of eagles had been killed before nesting period and that this bird was merely hanging around old nest sight. That this bird was an adult there could be no doubt. The white in tail was distinctly in contrast to black body & tail. The white spots in wings were not as prominent, however, as I have observed in other

5:20 P.M. arrived at farthest north switchback on trail to 'Y'.
5:21 Woodhouse Jay. and 1 inch Sceloporus. (8 min. stop) met Dr. Oaks boy and 2 friends on trail here. They had been to sheep flats. where we were going.
5:38 Hopper count through oak = 0 in 1 min. This is probably due to the fact that the fellows we had just met had influenced number to be found on trail.
5:40 Three sparrow Hawk circling overhead without any particular direction intended.
5:42 Sceloporus. new bank of trail. Practically all the lizards were observed on the steep banks created by making the new trail.
5:43. Hopper count in open situation like first count and revealed 16 per one minute.
5:42. Base of 'Y'. 5 turkey vultures circles on top of Y mt.
5:55 Sceloporus.
6:01 Eutamias calling (Sp.?)
6:08 Eagle or Devils gate. On approach through this gate at Slide Canyon. eight magpies left canyon and flew south along cliffs. Canyon wren called. 2 red tails circles above. 2 white throated swifts played in canyon and one Eutamias called below. (18 min. stop)
6:26 2 spurred Towhee and 2 Sceloporus. one red-shafted flicker flew by up canyon.
6:35 2 Woodhouse jays flew out around us and offered their calls.
7:00 First flat. where trail lead to maple flat. Several fresh gopher digging were now beginning to present themselves, their occurrance probably due to nature of soil and flatness of country. At the first left hand fork saw great horned owl flying through growth of aspen. Green-tail towhee calling.
7:25 At forks of Slide, one to sheeps flat, the other to first right hand of Rock Canyon. Just before arriving at these forks heard the evening screems of the young great Horned owl. While it was late twilight was able to see it for identification. It flew from the top of one fir to the top of others and calling from his high perch. I have heard these calls before at Elk Park in the Uinta Mts in Daggett County but was not positive as to their identification. Arrived at spring, up left hand fork at about 7:55 P.M. after setting up camp about 200' north of spring made a count of the water beetles (Dytiscidae) in spring from its source to the artificial pond about 50' away. They were generally distributed along course and numbered 45. The next day at about 3 o'clock P.M we only found 1 beetle in the entire course. that was checked last night at about 8:45 P.M. After watching moon come

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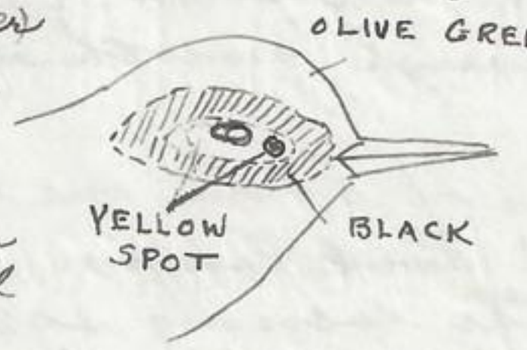
up over hill to the east retired. During the night the poor will called and deer almost came into camp.



(Picture only)

Our camp, taken by Harry has a picturesque setting with the majestic cascades in the background. The chokecherry growth on north side of small ridge in back of tent offered an excellent migratory lane for the warblers, however the aspen canyons accounted for the greatest number of bird that appeared to be definitely migrating to the south. After breakfast 9/10/38 left camp at 8:45 for Eagle cliffs on top of the 'Y' mountains. From the spring down canyon to the forks of slide recorded the numbers of birds found in canyon along trail. The canyon is about three blocks long and moderately steep for hiking either up or down. It is timbered with aspen with firs on either side. Mt. ash, chokecherry, red and blue service berry and other low bushes are found in the floor area. Species and numbers recorded as observed:

2 Junco canicaps. feeding on ground
2 Nuthatches. heard only.
1 R. N. Sapsucker on abies Concolor.
1 Dendroica like warbler much in head pattern as Townsend. Head olive green. demarkation on back between olive green of head and darker louter back. White outer tail feathers. White on wing coverts. Feeding on aspens.



1. Fly catcher Sp (?)
2 Plumbeus vireos (?)
10 L. T. Chickadee
6 Junco Canicaps. one junco chased a chickadee
1 Tamiascurus. on fir tree.
1 Spurred Towhee
1 Bateleder Woodpecker.
8 Junco Canicaps
2 Green. tailed towhee
4 Chipping sparrow
20 Junco Canicaps
8 Audubon warblers
2 Chipping sparrows



380910-2.81

birds. From this position photographed the overturn as presented in profile on the north side of Rock Canyon. I hope to someday record this beautiful example with the 5×7 camera and am sure that it will represent one of the best examples of an overturned fold. The negative is very grainy and not the best of quality, however will serve for record only. The sun rays, were filtered through misty atmosphere and reduced the contrast of high and shadowed lights. Leaving the peak at 12:42 I cut across shallow divide to the west and gained the corresponding peak on the valley bordering edge. From here can see practically entire valley. Mud lake is now practically extinct with just two small open areas on either side of the cancerous canal.



1-9-10-38

Left top of Y mountain at 1:40 and arrived at camp at 2:45. There appeared to be a decided lack in the number of species or occurrence of mammals or birds on return trip to camp and was in decided contrast to numbers observed this morning. At spring found an arrow point about 12 feet from water and would indicate that at one time the Indians hunted in these mountains. It was made of a reddish flint and thick and crudely fashioned



Two Tamiasciurus had been killed and cleaned at spring. In the artificial pond were found hundred of water striders while many were on spring stream proper. Years ago when sheep were allowed to run on these mountains the pond was always muddy and did not have a trace of vegetation around it, but merely represented a mud hole with knee deep mud the entire circumference, now, however, the vegetation is encroaching from all side and almost choking the small body of water. The west side is building a delta and is completely vegetated. Not only does this spring show favorable results from lack of sheep but the flat itself is still retaining natural foliage as compared to the conditions years ago when it represented nothing more than a dead field of defoliated stacks. Left camp 3:55 for return trip home and arrived at maple flat turnoff at 4:10. At 4:20 left trail and visited conspicuous cave on south side of canyon. We were interested in finding the large cave with several recessed rooms with stalagmites and stalagtites decorations. The first cave is only about 200' above floor of canyon. Did not find any bats here so left for examination



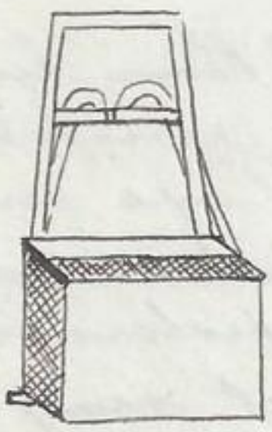


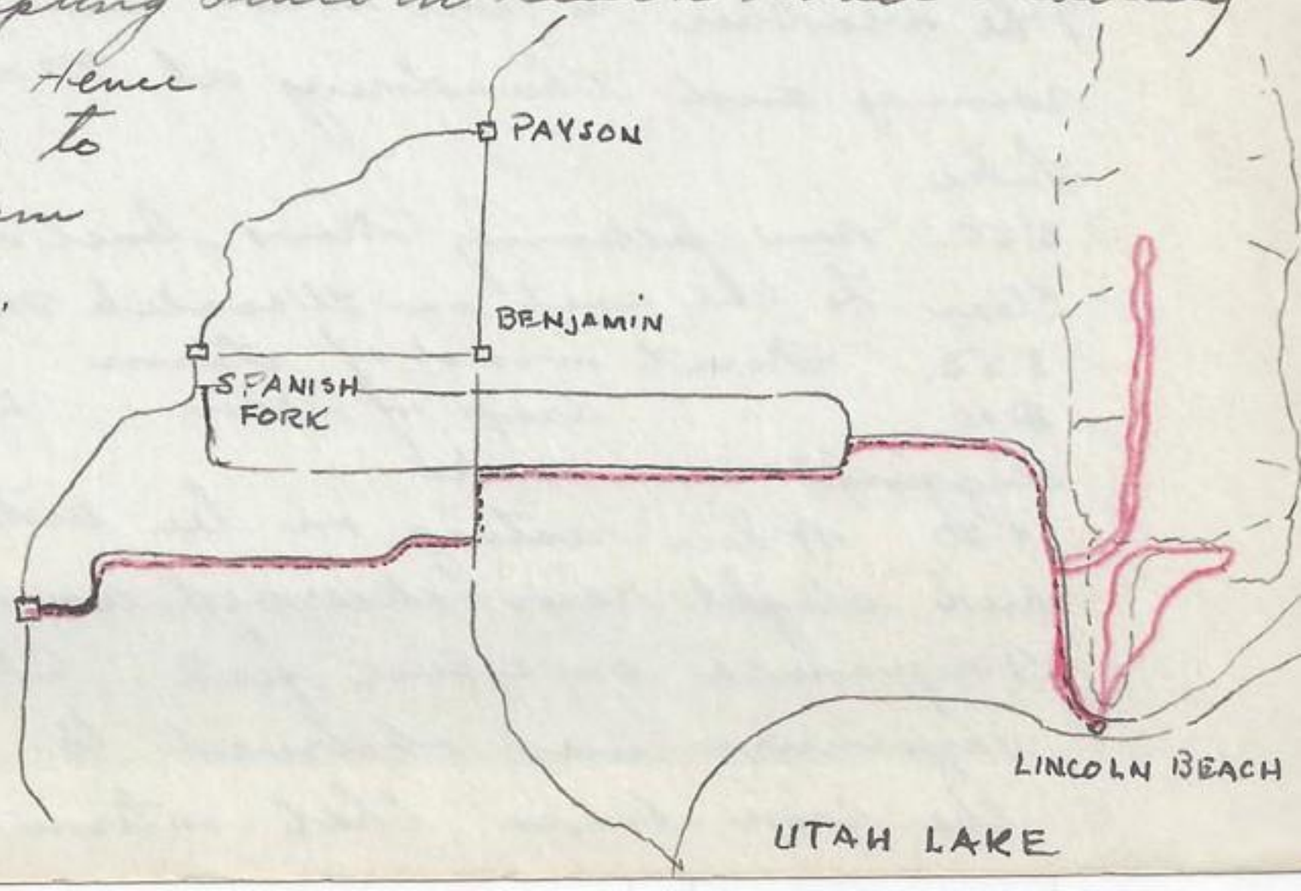
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of higher cliffs. This cave has one small room but very shallow., with roof covered with black surface like greasy smoke. at entrance saw pack rat which acted very unconcerned about our presence and rather than escape by leaving cave, chose to remain within 7 or 8 feet.
The next cave visited and to the west was about 10 feet deep and, 2 feet high and 3 or 4 feet wide. The bottom of this cave was literally covered with porcupine pellets. After searching the hillside for possible cave gained top of mountain to horizontal drag trail, hence east to Maple Flat Spring then down regular trail to where we left packs in Slide canyon. This first cave can be seen from trail at first large (not the 20' switchback) switchback on slede trail after leaving Eagle pass or devils gate. Coopers Hawk flew by. Being late (sun down) we hit trail and arrived at home well after dark.

9/16/38

Udell mt. Trip. Utah Co., Utah. Harry Chandler and I spent 2 days on West mountain in quest of the Eutamias d. utahensis and to check other mammal and bird forms. Had planned this time to take ice box with 3 days ice reserve and a new type of collecting box that would permit one to carry specimens for several hours without letting them spoil. The collecting box merely represented a wood frame and supports, with gunny sack on either end and on the top, thus permitting a good circulation of air. By adding water to gunny sack frequently, would act like a cooling system until we could reach car and place in ice box. In this way, one could collect 2 days and collect enough mammals and birds for a weeks work at the University, skinning and mounting. The box was then attached to pack frame and carried on ones back. Leaving shortly after lunch we drove over to Lincoln beach via of Lower Springville road and finally intercepting Lincoln Beach road leading west from Spanish Fork. Hence west to the single road leading to our destination at the warm springs at Lincoln Beach. Arrived at Lincoln Beach at about 3:00 P.M. Birds observed between Springville and Lincoln Beach are recorded as follows.





380916-284

1. Brewers Blackbird.
2. Vesper Sparrow
3. Wilson Snipe
4. Killdeer
5. Mallard
6. Pintail
7. Am. Coot
8. Brewsler Egret
9. G. B. Heron.
10. Avocet
11. Lark Sparrow
12. Am. Magpie.
13. Marsh Hawk.
14. Pheasant
15. Meadowlark
16. Mourning dove
17. English Sparrow
18. R. Shafted Flicker
19. Sparrow Hawk
20. nighthawk
21. Savanna Sparrow
22. Barn Swallow
23. Two flocks of Ibis 23 and ~~44~~ 43 in each flock or 66 in all
24. Townsend Solitaire
25. Cinnamon Teal
26. Green Wing

After spotting camp left for a short reconnaissance trip until dark! and planned on collecting south along promontory to the prominent Bonneville cut terraces on the main West mountain that can be seen from our station on the travertin shore line on the lake. This West mt. promontory is practically devoid of large tree growth or brush but is covered with a dry cheat grass and other small plant growth. The old lake levels are beautifully preserved here and stand out in profile as if they had been used just a year or two ago. This lack of vegetation and coupled with the presence of numerous small boulders, makes for an ideal habitat for the arachnoid group. Several species of spiders were found included among them a domance of black-widow spider. The wolffs red and black spider was also frequently observed. After leaving camp at 3:23 we arrived at Provo level at 3:36 P.M. 2 Rock wren and 1 jack left level.

3:40 Uta stansburiana among rock on beach of Provo level
3:41 Wolffs spider in small bush which had a grasshopper in jaws. The spider had clamped one jaw on eye and when released found the eye to be blood shot or reddish where spider had inserted jaw. Naturally a spiders or hoppers blood is not red so assumed that it may have been a chemical reaction from the poison of the spider. Three Uta and 1 sparrow hawk was observed here. The weather to the west looked threatening and was raining and thundering at Moseda on west side of the Lake.

3:50. Now following Provo level on west side of promontory. Clear to the east on Wasatch mountains.
3:53. First wind of storm
4:00 " drop of rain. Have noticed several rabbit diggings near rocks.
4:20 While resting on lee side of rock from the wind and slight rain observed an interesting activity of the Thysanura or silver fish. For about 2 minutes a Thysanura was observed to be very concerned with the rain drops that intermittently fell upon the

fell upon the flat rock surface. Whenever a drop of rain would alight upon the limestone surface the insect would hurriedly run over to the area and attempt to acquire what little moisture he could before the water was absorbed into the limestone grain of rock. Was interesting to note that while it visited all spots, it was particularly interested in the rain drops that were just falling.

4:47. Saw (rock) left rock pile calling.

4:48. Picked up skull of dead jack rabbit.

4:55 While working around hill to east side, frightened a resting nighthawk from its position on the lee side of ridge

5:15. Saw at base of largest rock slide on the Bonneville Terrace. This rock accumulation has been produced by the exfoliation of the upper cliffs upon the old erosional sidehill fashioned from the continual wave action of Lake Bonneville. This particular area is comparable to the Classical facetile spurs near the mouth of Spanish Fork Canyon. While the Sp. F. spurs are supposedly produced by faulting, these at west mountain are definetely wave action alone. + I have always felt that the facetile spurs of the Wasatch front are essentially the same thing as this rock slide, that is, they have been produced by wave action alone. I would judge that the width of the base of this slide area is close to 400 feet and from this definite base of the Bonneville level, tapers pirmid fashion to source of rock above. The accumulation of rocks, varying from rocks 4'x3' at the base to small slide rocks at top, does not support any vegetation but look more like good pika country; however there is no underground chasms or channels as is generally associated with pika slides, in other words, the rock accumulation appears to be more or less superficial. On the perepherial edges of this slide is found a rank growth of vegetation; much higher than any other growth found in near vicinity. Irregardless of what the plant may be, it generally enjoys better health. As to the causative factor I am at last to account for the phenomena. The dominent growth at base of slide, and apparently peculiar to this particular area, is the chokecherry. Here the chokecherry is found and from the manner in which it is growing appears to look like it couldn't leave the ~~edge~~ of the slide. It is only found in direct contact with slide. The immediate Artemicia out from chokecherry

380916-286

is in good condition. at center of base for 30' each way the chokecherry is apparently dead but beyond this limit is as vigorous as ever. Did not notice any berries on trees. Would think that an area suffering from the bombardment of waves would produce a larger beach level, but as it is, is represented by only a narrow ledge, possibly 25', before it drops abruptly to lower Provo and other levels. At this area recorded one small blow snake 18" long on beach at center of base of slide and 20' from it, two rock wrens in rocks proper, one Sylvilagus in chokecherries at south end of slide and several calling crickets and a few large brown & white spiders that had made makeshift webs across trail. From here followed Bonneville level to the west. Just as we left the slide discovered the skeleton and tail of a weasel. Left at

5:40. at 5:45 jumped Jack rabbit among Artemisia.

5:53. Rock wren among rocks.

5:54. Single Magpie started up canyon. At mouth of the largest lateral canyon to south and under a rock beneath a protected ledge, (Traveling on Bonneville level at mouth of canyon) Harry found second small blow-snake about same size as first one observed at slide area. The two forks of this canyon have a good floor of Artemesia & Chrysothamnus and so inspected for Jacks & cottontail. At left hand canyon approached 5 rock wren associated with a few rock outcroppings. They did not call but after leaving commenced to let themselves be known. Wolffs spider had moth in jaws in Chrysothamnus bush, others observed along route. On returning to mouth of canyon on Bonneville level, Harry reports seeing a green-tail. Two are and finds a pack rat nest associated with small blow snake found under the ledge. The rat had carried the yellow Chrysothamnus flowers into the recess of the overhanging ledge. The air is cool and everthing quiet and peaceful after storm. Pinyon jays now receiving shadows of western mountains and horizon. The storm was so interesting that I feel it should be traced through from beginning. First wind at 3:53 from the west. Western skies clouded & raining at Mineda while clear to the east. Wind increasing and a few drops of rain at 4:00. Now the direction of the wind changes and comes from the south bringing with it a very slight rain for about 12 or 15 minutes. Wind continues in velent gale for about 1 hours and then subsides. It would seem to me that the wind we first received was from the west and was a lateral pushing of the N. E. trending storm, then after the storm had gained momentum the wind changed and followed same course as main storm. Being on the perepherial edge received only the slight rain that would naturally be found on the

380916-287

peripherial edge of any storm. The main rain cloud continued north across lake mountain and out of valley through Jordan narrows. Could West mountain have effected or deflected course of rain cloud and if so just what part would it have played in the water currents of old Lake Bonneville. or the effects upon migrating birds or insects. At rock slide at Sand Survey Marker observed 2 Sylvilagus and one Peromyscus at 6:30 P.M. Attempted to collect the cottontails but could not edge in a good shot. Chased them for 20 minutes and they always returned to same general area of slide. It appears that the artemesia and chrysothamnus are much healthier and have better growth when found in association with these rock slides. These areas would be very interesting to study. The marker had corroded at base of cement filled pipe and is not in tact, so will report to Sand Survey. Left Survey Marker at 6:50 and returned to camp on lake shore. On way down found that the artemicia was only found in any numbers, at upper levels and may be due to either fire, overgrazing or exposure. So if one camps at hot springs at Lincoln beach do not depend on sagebrush for fire wood.

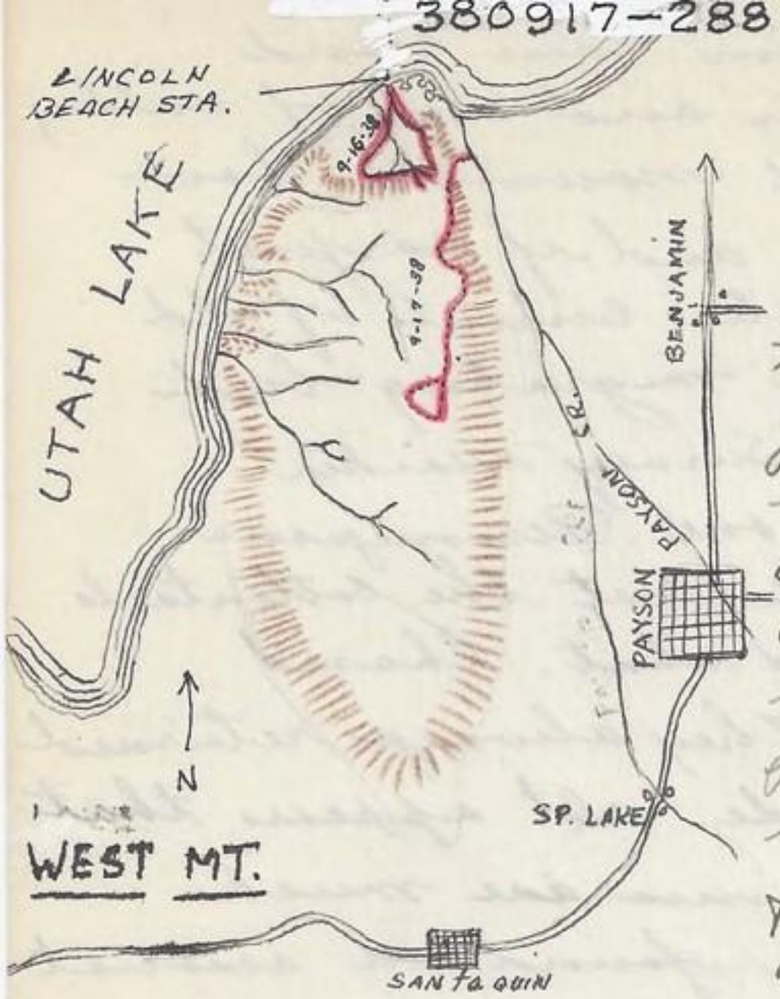
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* Next morning on 9/17/38 the sun lit on Lake Mountain top at 6:25. While cooking breakfast on lake edge an elevated traverse recorded following birds.

1. Cormorant. Pairs of two and single one flew along lake shore
2. Red Bell Grebe. Swam in isolated warm lake near our side.
3. Barn Swallows. Every where in the air.
4. Pelican. Flock of 15 flew by from south along shore line
5. Calif Gull. General
6. Brewster Egret. Last night they fed in warm lake at camp side many flew by this morning.
7. Ruddy. One individual swam by at mouth of warm lake entrance.
8. Spotted Sandpiper. Four or five flew around edge of pond and bay all morning, calling frequently.
9. Brewer Blackbird. Small flock in reeds in one of the bays
10. Caspian Tern. One bird flew by
11. Forster Tern. Couple dozen flew by in pairs, ones & 4 or 5's
12. Treganza G. Blue Heron. 2 attempted to light in bay.
13. Canadean Goose. Left shore line east of us.
14. H. Grebe. Counted 25 on lake with 8× binoculars.

Early this morning an adult bird and young fed in bay 40' away. First the adult bird would disappear beneath the surface of the water and in about 40 seconds would again appear some 10-15 feet from young bird, who, in the ~~it~~ submerged interium would anxiously await the reappearance of

380917-288



the adult bird. At the first indication of an unnatural ripple the young one, about 3/4 size of parent would extend neck to appear as if resting on the water and by an excessive amount of propellion would race towards the mother bird. She in turn would gracefully glide over to young one and offer the food held in its beak. A very noticeable thing about the whole stunt was the accompanying calls made by the juvenial at first sight of parent bird. After breakfast packed car and drove to closest point to the large Bonneville rock slide. Left car at farm house near the old indian cave of the Provo Level and by 8:00 A.M were packed and on the trail. Our objective today was to gain the top of West mountain to take panoramic view of country and to collect series of Eutamias d. uladensis among the mammals in particular. Having never been on top was anxious to find out the prevailing conditions as to vegetative covering and mammals. Expected to find some interesting reptilian forms also. On way up to slide visited last night saw rock wren at 8:15 and another at 8:21. In both cases they were found in association with rock outcroppings and they also heralded our approach. but stopped when too close to their position. They would either fly beyond or remain in general vicinity of outcroppings.

8:40 Arrived at Bonneville rock slide visited last night and found an entirely different atmosphere surrounding the area. on approach at 20' away saw a mephitis occidentalis major (874 J.B) feeding unconcernedly among the bases of the thick chokecherry bushes. not over 5 feet away from skunk a cottontail rabbit left and ran across the rocks at base of slide and when about 30' away started up the rock slide and then stopped. Collected this rabbit (875 J.B). After the rabbit left the skunk [illegible] turned about and leisurely walked away with his head and nose on the ground as if proceeding normally along in its hunting operation. Collected the skunk at about 20' which was not too close to become involved in its return firing. Besides these two mammalian forms, many smaller birds were feeding on the chokecherry trees and the rock wren calling from the rock pile. After removing entrail placed on ground under covering of artemesia. Left slide at 9:05 and planned on following main trail up ridge leading to the south.

9:12 Rock Wren calling in rock pile

The Barn swallows were literally everywhere and could be seen at most any time. One particular flock of about 60 birds were attempting to alight upon the sage brush and chrysothamnus bushes on crest of hill above rock slide. Many of them were already reposed upon limbs and when not in air were resting on ground. There appeared to be a general migration all day today as well as yesterday afternoon.

9:36. Examined neotoma nest under protective ledge of rock. Very little accumulation was found but evidence of hair leading back into recesses of rocks.

9:43. Neotoma in prominent outcroppings to west near top of first knoll.

9:45 Top of first hill. Marsh hawk flew by. Stopped at rocky point here at east side of ridge for 15 minutes and then left to join main trail again.

10:10. While traversing the west exposure of the next hill-top flushed a juvenile nighthawk. Flew about 40' and then lit on bare ground in shade of Artemesia. The sidehill here was constituted of Artemesia and interspersed with rocks & near crest of hill. Made very slow approach and when within six feet, knelled down and slowly, without any abrupt movements, extended hand toward bird. It remained there for possible 3 minutes until my hand was within 2 feet of it whereupon it left and flew about 50' away and lit on flat rock with Artemesia surrounding it. Made second approach and both Harry & I got picture at about 8 feet away. It remained here, in the open situation and in full exposure of sun for a few minutes and when approached for closer view flew but for only 30' and lit again on rock in similar situation. Out of the three landings two were on rocks in sun shine, while the other one was on bare ground in shadow of bush. This bird appeared to be a juvenile and therefore its apparent unconcerness about our presence. Watched a barn swallow pursue a nigh hawk, not with intentions of attacking it, but merely following closely behind it.

1-9-17-38

10:45 Crossed low pass on main trail. This pass supported a much better soil than found on hillslope. Due to this factor and possibly to the level nature of the terrain several colonies of Dipodomys (?) had collected. Yesterday I examined a colony of dipodomys (?) on 30° slope, so possibly the above

380917-290

case will have to be explainable by the soil condition. Another peculiar thing about these low passes is the fact that here one finds the artemesia replaced by Chrysothamnus. It is on the beautiful yellow colored flowers of this plant that one would find the greatest degree of insect life, at least the greatest concentration of flying insects that we rather limited in numbers. Red-tail flew by. Many runway led from one area to another. The community of holes were represented by a differentiation of color of dirt and generally stirred up and many holes both new and abandoned.

10:55 Collected a Phrynosoma douglassi ornatum in trail. Here the area is gently sloping sidehill, north exposure, supporting short artemesia and cheat grass.

11:06. Rest period. In the meantime 2 marsh hawks and one sparrow hawk flew by. Have wondered why these hawks were found here when their appeared to be such a decided lack of small mammals.

11:30 Just as we were leaving spotted an eagle flying south along mountain below us. After hunting for a short time left hillside and gain altitude in a succession of spirals until some few hundred feet above the level of the mountain at our point, and then bearing directly west in a straight course and with partially closed wings pass over ridge and soon was intercepted from our view by the western hill & ridge. At one time as its soaring a barn swall attacked it, at least followed in close pursuit.

12:25 at eagle profile. This is so conspicuous that one could hardly miss it if following along the east crest of the ridge. It is of a red rock and a perfect head image of an eagle. The red stratum can be traced above it and to the north on ridge. The rock strata here are perpendicular or dipping strongly to the west. at the profile collect a red-pentstamen like flower with double corolla in blossom Red-tail and marsh hawk flew by each other without any apparent concern about one-another. From here can see the top above the cliffs just a short distance to the south. Top at 1:00 P.M. While sitting under juniper viewing the continuation of the mountain to the south a large Bombylid paused above ground at feet and after alighting deposited or attempted to deposit her eggs. During the time we were there it visited the same general area on five different trips and deposited her eggs. Could not determine just where it went after each trip but returned each time ~~after~~ about a minute and a half interval. In depositing her eggs she always chose the areas where the ground of course dirt & juniper trash had been aggitated by ~~the~~ our heal or foot imprints. After tempting to deposit on normal and

undesturbed ground would finally alight upon the newly desturbed areas for the final act. This area was in full exposure of sun except toward afternoon when lengthing shadow of jumper would intercept. Felt it very remarkable that such an insect could return to same square inch time after time. to Red Tail flew by with partially closed wings and lit in juniper on divide to south.

2:00 P.M. Leaving our station on top and making little reconnaisance ~~to~~ in close vicinity to find out just why we have not encountered any mammalian forms since leaving Bonneville level this morning. The course took us to the west, south and finally arriving at Juniper covered pass below & south of our present point. All ground covered within 3 blocks of station on top. and during a period of 1 hour & 45 minutes.

mammals & Birds observed & collected during this period:

(87838 J.B) Eutamias d. utahensis. Among large junipers on west exposure near top of canyon about 2 blocks to the S. W. When first observed was 30' away & stopped at base of tree. After collecting could hear another one possible 100 feet away but in same group of junipers. I after words saw it but did not have a chance to collect. Associated with this stand of jumper at head of gulch were 4 cottontail rabbits 2 of which I collected (87638 JB) 14½" – 2¼" – 4" and (87738 JB). These Sylvilagus were found at perepherial edge of jumpers and when jumped would run into grove. One of these had resting hole under a artemesia and another one under a chrysothamnus bush. Beside pellet indication were several dusting bowls that had been used by cottontails and were found again on perepheral edge, general place on ridge or flat area. The numerous fresh jumper berry seeds found upon the logs and ground indicated the presence of the Eutamias. (879 38 J B) (880 38 J.B) and (881 38 J.B) were collected in pass at a point directly south of highest point. all three taken within 200 of each other and in same general grove. One other was heard but not collected. Generally found either running on the ground or in jumper. The one collected in jumper was calling loudly. These Eutamias also have a bird like call resembling the clucking of a mother hen. Here again was found considerable evidence of the Eutamias in their piles of jumper seeds found upon the tree trunks & ground. Jumped 3 more Sylvilagus and one Lepus. c. d. The Jack left

junipers quietly and after 20 minutes of shooting was again jump in same vicinity. One bat which looked much like a Tadarida left a jumper tree and flew across tree tops. out of sight and was resting on west side of tree about 8' high. During this period of reconnaissance felt like there was represented an abnormal congestion of Eutamias, possibly because we had not seen any mammals on trip this morning. Observed on factor, however, that would probably account for this particular thing. The sections or groups of junipers visited were remainders saved from a raging forest fire that at one time had eaten up a good proportion of the tree coverage. In this vicinity entire sidehills ~~were~~ had been burnt bare of jumper with only the black stumps preserved. What trees that were saved from complete annulation were standing as dead sentinels. The isolated groups of juniper supported the abnormal number of Eutamias & Rabbits at least abnormal comparatively speaching when comparing with result gained so far this morning. Beautiful stands of jumper could be seen further south on west side and would be interesting to see just what the numbers of Eutamias would be there as compared with this area. Again this section represents the most northernly point upon which are found the nice large jumper tree which is favored by the Chipmunks. and is possible that this might account for the situation; a barrier of lack of junipers. Back to top at 3:45 and after watching 2 Eutamias d. dlahensis that Harry had spot left for trail. Harry had noticed these chipmunk about 1/2 hr ago and when revisiting area found that they had left the rock last exposure and had crossed redge to the west and were found in a few jumpers. They apparently do not range very far from home site or travel from one point to another very slowly. Leaving top at 4:30 and expected to be in Provo by 7:30 so made hurried trip on return. However made one or two interesting observations on way.

4:50 Collected Coralus viridis lentosus in trail. Harry was leading at time and came within 3 or four feet of it before spotted. It was coiled in trail and did not offer any noticeable sound or rattle until molested. Its head was placed under coil, but could have been so place during the interim between Harrys sidestepping and the time we ~~were~~ had collected ourselves again. A cloud shadow was on mountain at this particular spot when snake was first located. Harry collected and was placed in reptile House at B.Y. Univ. where todate (week later) it appeared to be ok.

300 feet from the area where Crotalus was collected found a Dipodomy community on last flat pass. The 2½' high artemisia covered hillside.

5:00 Collected Phrynosoma douglasii ornatum. Here the Artemesia was short and considerable more dry cheat grass and chrysothamnus was present. Probably a coincident but the Crotalus was associated with Dipodomys while the Phrynosoma with the insect supporting Chrysothamnus.

5:40. Revisited the Bonneville slide and picked up mephitis. Little activity here now. Attempted to explain the factors responsible for the ranker growth of vegetation around rock slide. Would it be possible that there could be a spring; or is it due to the fact that the neotoma, Eutamias and others had brought in the seeds or is it soil conditions or just what is it. Harry compared it with the principle used in dry desert area where the warm, hot air is circulated among sealed chambers made of thick stone walls. When the hot air comes in contact with cold air there occurs a condensation upon the walls to the extent that water ~~drips~~ are formed. Have wondered whether it could be compared to an ant hill where one finds higher plants on perepheral edges. From here was just a short ways down over the Provo & Stansbury levels to car at farm house. The profiles of both the Provo and Stansberry levels are excellently preserved toward the north end and on east side of the promontory. This north end of West Mountain would be an excellent place to study the old lake levels because aside from the main Bonneville, Provo and Stansbury level are many intermediate one that appear to have been important stages in the receeding of the original lake. Arrived at car and soon had mammals on ice and headed homeward.

Suggestion: Take alimentary canal and larger organs from mammal in field because regardless of their contact with ice in ice box, will develop gangrene condition and start hair slipping if not deintraled. The 30 lbs of ice last 3½ days and if mammals are properly taken care of will can be maintained for several days before mounting. While this is not a good practice, is important when one can only be in field one or two days a week, whereas in cold storage one can prepare them in the evenings and whenever time will permit.

Plan some day to throughly collect in hot spring at Lincoln Beach. Several dytiscids were observed in warm water when we were camped there last night. The next trip will be from west side, over mt. to east side at the southern end of West Mt. From top could see grove of maple to south and suspect a spring or damp area associated with it. A good trail leads to it from the east.

380917-293

(Pictures only)







From highest point in about the mountains to show, as near as possible an panoramic view a















380925-294 (9-25-38)

Found an Orange Crowned Warbler beneath maple trees 3rd east 2nd So. Provo. Utah. Tail coverts lighter than specimens and no orange crown. These Warbler are frequently found in Great numbers in the higher branches of these maples. L. 112 m.m.
W. 60 m.m
Tail 40 m.m
Sex (?)
Bill 10
Tarsus 19
Toe 11.5 withaut claws.
Placed in University collection (882 J.B.)

9.25-38.

made trip across foot hills from State Rental to first canyon north of rock Canyon. Observed a few Cnemodophous near mouth of Rock Canyon. Trip ended with Jock, my dog, breaking his leg. Improvised splints and when arriving at home set leg. at a point below mouth of the last mentioned canyon observed a weasel run across the road about 7:30 P.M. (see notes of some day beyond in book)

9-17-38

Mephitis collected on this day (see notes) measured, 23½ inches in length, 10 3/4 inches tail, 2 3/16 inches foot, no. (87438 J.B). Also no (11 87638 J.B) measured 14½ inches length, 2½ tail, 4 inches foot.

9/30/38

made trip up Spanish Fork Canyon to investigate. Eutamias d. utahensis. First Canyon at about 1 mile down canyon from a point where Deamond Fork and Spanish Fork Converge. and about the 2nd small canyon up canyon from Castella. Passed up this canyon to rock slide hence up west side hill to tip of cliffs and then to highway again. Heard only one Eutamias at top of ridge. about 20 minutes before twilight. This Canyon should supply several different species because of the varied habitat.

10/6/38.

made second trip up Deamond Fork Canyon to the same site as of 9-30/38. In the field from 8:00 A.M to 12:30 P.M. This Canyon can be readily told by the numerous rock outcroppings with honeycombed sections. A large rock slide near forks about 2 blocks

up the Canyon. Collected all the specimens in the morning from 8:30 A.M to 9:30 A.M. All the Eutamias collected were at the mouth of the canyon and within 80' of each other. They prefer the very mouth and are found in association with the larger trees to be found there. Oaks and maples predominate. There appeared to be an abnormal congregation of these animals at this point. It could have been possible that the larger trees and more open portion of the canyon was preferred to the more or less narrow portion beyond. Their warning calls could be head from many angles, some coming from dense brush on hillside, some among the rocky cliffs and slides, some in the opening and others in bottom of deeply traded gulch. Collected the following.

88338 J.B Eutamias, d. utah. In top of oak tree calling

88438 J.B " " " " " " " " " "

88538 J.B In top of maple tree calling. E. d. utahensis.

88638 J.B E. d. utahensis. In top of dead maple tree calling.

88738 J.B On ground in bottom of gulch. Was being chased by another chipmunk. Could has been breeding.

88833 J.B In oak tree calling.

88938 J.B In top of oak calling.

89038 J.B In top of oak tree calling.

The Shufeldt Junco (?) sp., about 15 in flock, several robins were also observed here. One Neotoma nest was examined at base of ledge near bottom of gulch. It had only green dried leaves closely hugging cliff. Very little debris was associated with this nest. However about 10' away and along the same cliff was a normally constructed nest of dead, dry sticks. The next collecting point was about 1 mile above the mouth of Diamond Fork. This Canyon had been used for a quarry and considerable red rock is exposed on both sides on gully. About 15 Eutamias quadrivittatus consobrinus and utahensis were found in the Canyon and again near the mouth. They were not found in the tops of the trees and were considerably more wiery. This may have been due to the time of day.

collected the following here:

(892) Citellus l. c. in talus of rock quarry. It had its hole among the rocks.

(891) Eu. m. c. Running up rock slide area.

(892) " " " " " "

these are found "to be harder to approach than those collected near Costella.

(886) Testes 7 m.m (proper)

(885) Uterus normal. (884) uterus normal, (887) testes measured 7 m.m., (888) uterus normal, (890) testes 4 m.m., (883) uterus normal, (889) uterus normal, (892) testes 3 m.m. (893) testes 8. m.m. Other birds & mammal observed here were several rock jays and 4 cottontails.

10-9-38.

Another visit to the second canyon mentioned above in notes of 10-6-38.

(901) E. m. conso. poor skull and (destroyed). 190 86 ♂ 30.5 35 gr. wt testes 7 m.m

(904) Eu. m. conso poor skull (destroyed) 185 86 29 ♀ 38

(899) E. m. conso. (dest) poor skull. 194 88 ♀ 28 37

(909) E. m. conso. (dest.) poor skull 198 92 ♀ 28 34

(902) E. m. conso (dest.) poor skull 194 88 ♂ 30.2 38

(907) E. m. conso (dest) poor skull 192 86 ♂ 27.5 33 gr wt

(913) Sylvilagus ♀ 350 48 98

(912) Citellus g. Utah. (dest) 453 200 ♀ 58

It appears that the Eutamias d. utahensis ranges well up into the Spanish Fork Canyon at least from the congregations found here were felt that their distribution was more extensive. Also they were found in association with Eu m. conso among the pines, oaks, maples of the canyons to be found here. Observed two other Citellus l. cos. near here also. They had their hole, not among the rocks but in the side of an erosional bank under some brush.

Appendo to 10-938. Left today on Sundays morning at 7:00 to make another trip up Spanish Fork and Diamond Fork. On the 8th we had a change of weather from the Indian summer days to one of cold wind and dreary weather. The snow 1/2 way down mountain sides, clouds clinging low and skies generally overcast. This new weather change was preceded by short thunder clouds, lighting and rain. The morning of the snow the clouds moved N.W. on the morning of the 9th, which is today, had new snows. at point where the Bonneville shore lines on west side of Spanish Fork Canyon are eroded saw a porcupine. Strong wind down canyon. At canyon near Castella heard 4 other Eutamias d. utahensis besides those collected, One other cottontail beside the one collected. No citellus. Examined Neotoma nest with green leaves of oak, maple, chokecherry, nine bark and other rubbish accumulation. At the second Canyon in Diamond Fork observed 7 woodhouse Jays, 6 sp. towhees together in one group, magpies, Jack of Chipmunks, 2 Cottontails, Dead deer, R. S. Tucker. 100 Juncos probably Shufeldt. At the 3rd Canyon, which is just beyond the Quarry Rock Canyon saw 5 citellus and 1 cottontail among the rock slide near mouth of Canyon, probably a family. No Lt. Cont where there had been seen the trip before. Next Canyon beyond saw 22 Eu. m. cinn, 5 of which were together + Eu. d. utah; 1 snowshoe, dead deer, water in creek bed, Jay + Lut associated together. This Canyon is very broad at the mouth with large Cottonwood near road and creek edge. The Eut. were found both near the water in the gulch as well as far up the brushy and rocky hillside to the last.

See page 300 for 9/19/38 (also 9/20/38 and 9/21/38.)

9-25-38. (completion of notes)

Left home 6.53.1 m. Arrived at point in slide canyon where it starts to cut through the upper level of Bonneville at 7:40 A.M. At the marsh pastures at about 13th east and 2nd. North observed the largest flock of migrating yellow-headed blackbirds that I have ever witnessed. Estimated there were about 30 thousand. There were at least enough birds to nearly darken the sky, as they flew up from the road, fence line and pastures. As far as I could tell they were all ♂ birds. Also observed a

migrating flock of robins. Counted about 100 brewers blackbirds at the State Mental grounds, all females, heard two meadowlarks. Eutamias d. utahensis in slide Canyon gulch, ran at 100' and gave sharp calls. 7:45 and no sun on area as yet here at the base of slide canyon, but can see the Brimhall building just receiving its first rays of light. Farmers below shooting pheasants. Haze on top of Bonneville level. Day clear. As the fires are built in the city the smoke accumulates. The wind brought first odor of smoke here.

7:54 Rabbit (Jack) jumped out from under burnt oak.

8:00 Arrived at limestone boulder on Bonneville level about 100' north of "Y" trail. From here a recent fire shows a scar 200' above Bonneville to 2 block north of here. Oak leaves dead at outer edge of fire track but not not the trunks. The burnt over area shows the extent of rocks. Leaving 8:00. At 8:05 Flicker flew by to N.

8:15 Mine dump & mouth of Carcass Canyon. Now out of burnt area.

8:16 Cottontail. 8:19 Magpie. 8:21 Magpie flew N.

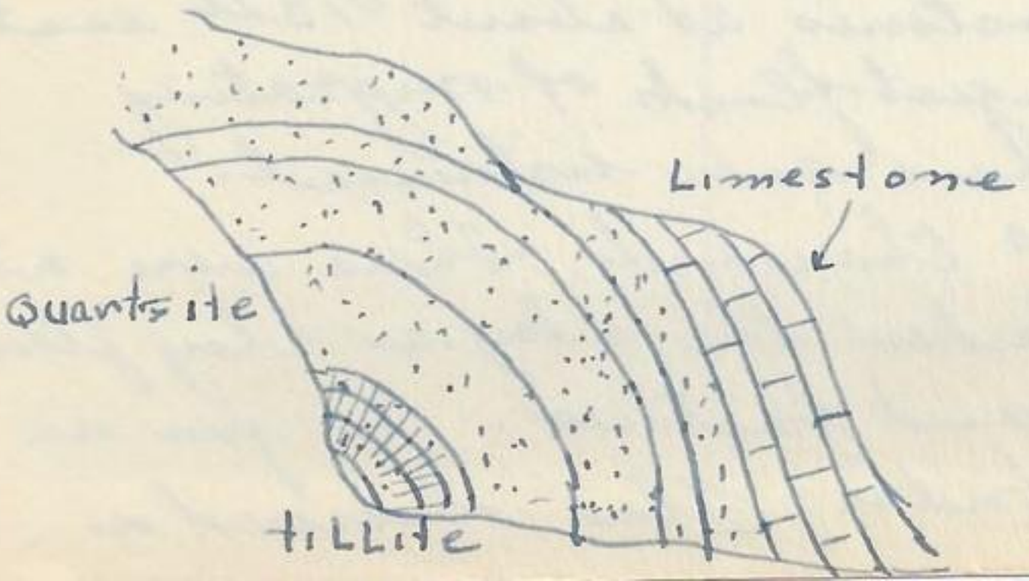
8:23 Two flickers on wall of limestone

8:25 Entering basin. 2 Eu. d. utahensis calling and working progressively uphill.

8:32. Divide to north.

8:35. Sharp shin flew just above ground across mt. side. 4 magpies following the hawk. They were no doubt following the hawk but they did not call when they lit in the same tree as the hawk was in. Eutamias did not respond to presence of the hawk. Rock Wren calling.

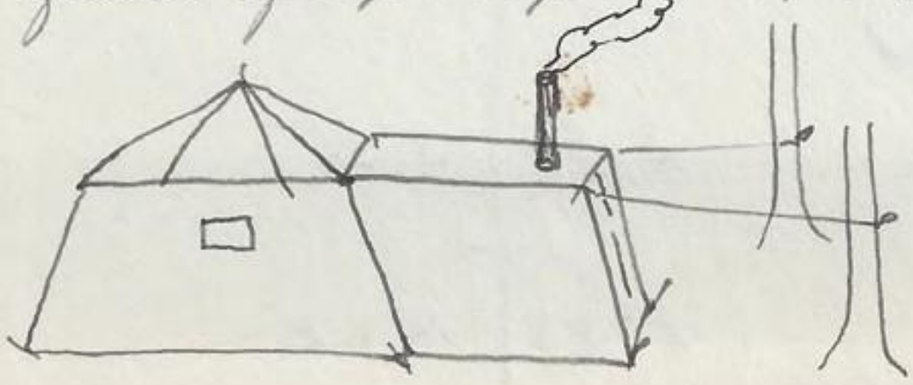
8:36 While I sat at the divide could see a predominance of oak in basin here, 2 maple trees but several above, and hackberry, cliff rose on ridge where I sat. Trace of sumac. The maple in red color, hackberry turning but the oak is still green and apparently unaffected. As I remained here I sketched a profile of the geology on the south side of the basin. The basin is merely an opening in a little canyon at the base of the mountains but well formed & rather hidden. The limestone drag is shown but needs confirmation.



as to its connection with the quart-gites
8:45 Leaving. All very quiet except an occasional magpie. Lower leaves of sumac red but upper ones green.
8:50 Roadhouse and Magpie.
8:54 Sparrow Hawk.
8:58 Top of boulder accumulation just north of easter cross site. Sharp-shins diverted but continued flying south.
9:00 Poor-will flushed from depression made by one of the dislodged boulders. Shaded condition. One of the plunging rocks from the mountain side snapped a 6" huckleberry tree as if it were a toothpicks..
9:10 Drag-pits. These pits which are presumable of a drag nature appear to me to be nother more than the light colored material directly above the tillite and just accidently exposed here on the west limb of the anticline
2 Seelyporus.
9:22. Spurred towhee singing. Thrasher calling. Observed a magpie to dart from the flying flicker as if it suspected a hawk. 5 magpie flying by.
9:51. Otolleus g. utah.
9:52 Cremnobatus 9 inches long. 1 Seelyporus.
9:58 Stone Crossed rock cairn and now on corresponding level on north side.
9:59. Cremnobatus 7 inches long. Red-tail.
10:09. Spurred Towhee. One Cit. v. utah.
10:13 Service-berry 10 inches in diameter at base. Magpie flying down hill.
10:30 Thrasher
10:35 Otolleus. g. utah near canal.
10:39. Abnormal gathering of Cremnobatidae.
10:45 42 Turkey Vultures.
10:55 Eutamias d. utahensis calling from among the oaks.
10:58 Mouth of Canyon. 4 mags. bird 1 flicker. It was at this point that the jaunt ended with the dog foolishly chasing a pheasant to near the edge of road embankment.

Entered 9/25/38 - see page 27 [INSERT] 38102-308

10/19/38. Left home today at 11:20 A.M. for hunting grounds at the head of Indian Creek. Dad and I have hunted deer in this area for several years and plan on giving it another year. Prospects of gaining our old hunting grounds at Indian Spring appeared to be very discouraging, for the weather of previous days had be inclement: and there had been several inches of snow deposited upon the higher elevations. A premature storm had also been experienced several years ago and we knew what would be involved in travelling over the high divide between sheep Creek and Indian Canyon. Arrived at divide of Sheep Creek at 2:05 P.M. Snow on divide 1½ inches deep. No doubt there had been considerable melting before our arrival. At 2:05 the upper few inches of ground in road had melted and produced a very slippery course to travel upon. Even with chain on, there were several hills that almost checked our invasion into our hunting ground. Fortunately we did not tarry long below because the warmth from the sun had already penetrated the first inch of frozen mud and within another hour or so the frozen line would be too far below the surface to assist in offering traction for the tire treads of car. The proper time to travel this road is during early morning, at least when course is in this condition. The condition of the road this year kept many cars from entering the head of Indian Creek, and therefore permitting greater privacy. This storm generally comes about a week later. Arrived at camp at 2:30. The course down Indian Creek was problematical but by putting car in reverse we kept from sliding. By driving slowly and cautiously we finally arrived at old camping grounds at Indian Springs without disaster. Were quite surprised to find another party already camped here but later found that they had arrived earlier in the morning and had come from the Strawberry road. They found however that the road were very muddy even at that time. Located camp about 150' up canyon from where road crossed creek bed after leaving spring. After clearing five inches of snow from ground at camp, set up tent. By 4:30 we were organized and ready to cook supper. Used regular umbrella tent with walls supported from flap top. Wood stove completed accomodations.



While setting up camp the Tamiascuckus called from the north side of Canyon where sun still lingered.

38 10 25-30

At 5:50 P.M watched a Snowshoe rabbit in Canyon bottom among the firs and aspen. From the top of the fir covered hill to the north can hear the weird call of the poor-will. It continued for some time. Two different parties at camp reports 2 herds of six each, one with a large buck Snow at Camp 5" deep. North side hill clear of snow.

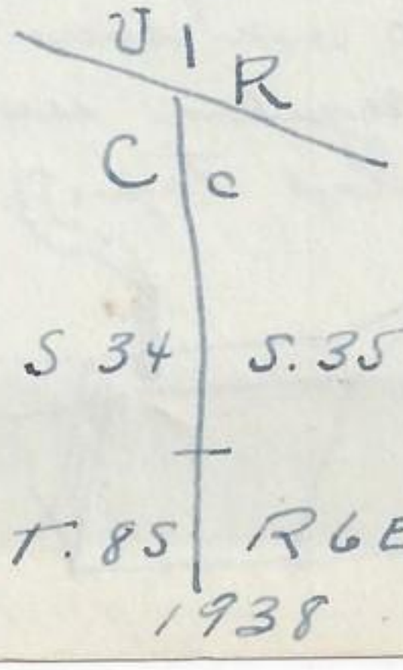
10/20/38

On the open day left camp at 5:40 A.M and had deer by 6:20 and dress by 7:00 and back to camp for rabe to cover deer by 7:20 While on way back counted 8 Tamiasciurus in fir trees. At the first shot there were 7 does & 2 bucks. Later saw 2 ♀. At 8:00 saw 1 buck & 1 doe, 4 magpies & 3 grouse. (Gray Ruffed). 1 of the grouse in among the Chokecherry. 10:00 3 bucks 10:30 two ♀ & one ♂ deer. 12:50 Two deer ran across top 1:10 Saw ♀ deer. 4:30 Grouse (Ruffed) 4:45 Doe. 5:00 Microtus runway on hillside among the sage and other brush & Serviceberry & Chokecherry. no water habitat near., or at least for 1 mile. 6:00 Heard Great Horned Owl. calling and young ones screaming.

On the third day 10/21/38 Left Camp * 5:50 A.M. at pass 6:25. Utah Jay active 6:30. The proper time to leave camp to be out on top at the proper time would be about 5:45, just as dawn is beginning to show signs or better before dawn is in evidence. Western evening Grosbeak and Pine siskin flying by as if over Indian to greet the first rays of sun. at 6:45. 7:05 2 ♀ Does. 7:20 Grosbeak. 7:35 Doe. 8:30 2 R. Mt Grosbeaks 9:30 Two does left bench followed by a smaller one. Canadian Jay near. Birds observed so far.

1. Chickadee
2. Clarks Crow
3. Magpies
4. Utah Jays
5. Nuthatch
6. Goshawk.
7. Robin
8. Thrush.

The Grosbeak seem to favor the north side of mountains among the aspen and the conifers. 3 deer left stand of timber on baldy mt. at 3:45 saw 2 does. Examined marker on top of the big mountain west of Camp.

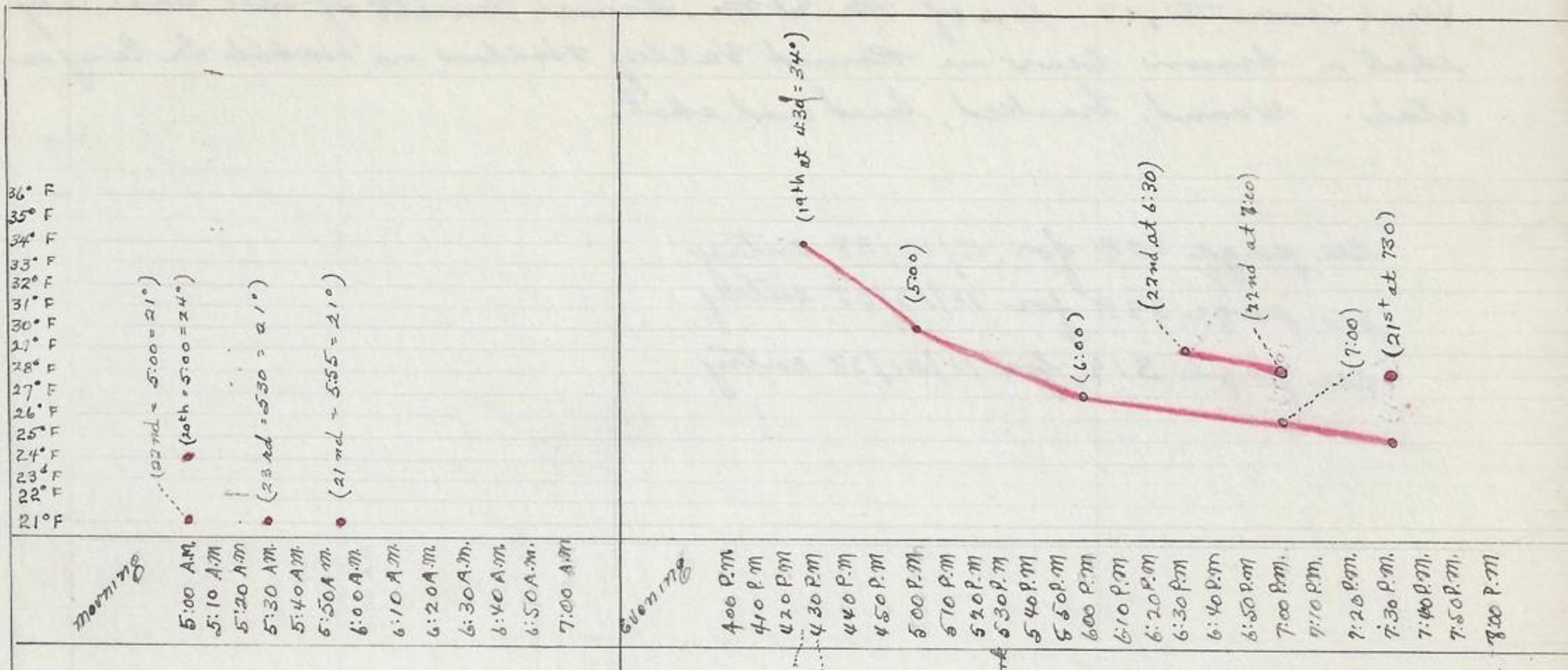


Returned to camp. Peromyscus active as well as a Microtus like animal which could be a Red backed mouse, Ochenomys etc. On the * third morning 10/22/38 Left Camp 5:50 7:20 2 ♀. This morning saw a Porky, R.B. nuthatch,

381025-302

Causual Temperature and weather observations. 19th to 22nd.

Morning		Evening	
5:00 A.M.	(22nd = 5:00 = 21°)	4:00 P.M	
5:10 A.M	(20th = 5:00 = 24°)	4:10 P.M	
5:20 A.M		4:20 P.M	
5:30 A.M.	(23rd = 5:30 = 21°)	4:30 P.M	
5:40 A.M.		4:40 P.M	
5:50 A.M.	(21st = 5:55 = 21°)	4:50 P.M	
6:00 A.M.		5:00 P.M	
6:10 A.M.		5:10 P.M	
6:20 A.M.		5:20 P.M	
6:30 A.M.		5:30 P.M	
6:40 A.M.		5:40 P.M	
6:50 A.M.		5:50 P.M	
7:00 A.M		6:00 P.M	
		6:10 P.M	
		6:20 P.M	
		6:30 P.M	
		6:40 P.M	
		6:50 P.M	
		7:00 P.M.	
		7:10 P.M.	
		7:20 P.M.	
		7:30 P.M.	
		7:40 P.M.	
		7:50 P.M.	
		8:00 P.M	



About dawn.

20th - 6:55 - Sun up on Tops.
22nd - 7:00 Sun up on Four Sheep Peak.

19th - 4:35. Sun down on Indian Spur. Jasper...
19th - 4:30 Sun Shadow 40' up N. hill from camp...

19th - 5:38 Sun off high hill at head of Tie Fork
20th - 5:36. " " " " " "

Skies clear but slightly hazy on the 19th, 20th, 21st & following day on the 22nd. clouds appeared for first time. Wind generally in mornings. before dawn. On high hills but not on floor of canyon.

2 Grey Ruffed Grouse, . Colorado Angle-wings, 2 Grasshoppers active at 12:00, a few flies but not many. At 1:00 saw 1 G. R. Grouse and also 1 at 2:00. At 3:00 3 ♀ and buck
4:00 2 R. grouse. 4:15 2 does, 2 fawns
6:30: 29° F. On the 4th day left Camp at 5:30
Later in day I tammed a U.S. Coast & Geodetic Survey Reference Marker.. This year only got one deer but was in good Condition. One noticeable observation was the decided scarcity of the G. Ruffed Grouse, when compared with the numbers observed other years.

Thistle
1937
Azimuth

381028-303 10/28/38

Veral Averett, 17, son of Mr. and Mr. Lionel Averett of Salt Lake City shot a brown bear in Round Valley Hollow in Hobble Cr. Canyon. Utah. Wound, tracked, treed and shot.

see page 308 for 11/12/38 entry
see page 315 for 11/13/38 entry
see page 319 for 11/21/38 entry

11/25/38 Harry Chandler, Bob Newell, Dwight Taylor, Ed. Free, Blaine Carlson and myself placed the Troop 51 Honor Plaque at the head of Grove Creek on the face of Mt. Pumpanogas. This copper plaque with the names of all previous honor hikers inscribed thereon will be retrieved by the chosen honor scouts of Scout Troop 51 sometime in the later part of February, when they will, beside getting the plaque, participate in a three or four day winter camping trip into this area ~~with~~ depending on nothing that can not be carried upon the back. Drove to the mouth of Grove Creek arriving at 8:40 A.M. After examining ice pond created from the impounded waters of the crossonal dam placed at mouth, harnessed packs and left mouth of canyon proper at 8:57. Soon found that we were coping with true winter temperature when our pocket thermometer registered 22° F. Coupled with the frigid breeze blowing down canyon from the snow covered Pumpanogas in the background found burselves drawing on gloves or adjusting ear flaps of our head gear. Dwight was the proud possessor of a wonderful and trinket adorned skull cap, but found only to soon that it did not survive its purpose here and so with a little ingenuity fashioned for himself a protective headgear with his scout neckerchief. Ground frozen solid and snow confined mainly on the south side of the canyon. Deer tracks inevidence even at mouth of canyon. Nothing stirred in the way of bird or mammal life no doubt due to the freezing conditions still prevailing here at this early hour. Being refreshed and invigorated by the morning breezes we soon put space between our advancing party and the car we left behind. Observed first deer at 9:10 A.M on north side of canyon. It seemed to be standing alone among a small group of birch trees but in a few minutes five others presented themselves. They had been bedding down on this exposure on our approach left very unconcerned and worked west around point of ridge to west exposure of mountain side. One large buck controlled our attention and his activity and manners were observed for some time. These deer were observed on north side of canyon between the lower trail in the bottom of the canyon and the upper trail leading west from the first switchback. When the buck was first observed it was following in back of two ♀'s west toward the second switchback on the uppermost trail and as they approached the ridge it allowed the two ♀'s to investigate as to what might be on the other side. Instead of following its mates

worked straight down our side of the ridge to a point 30 feet above where the trail led by. Three of the fellows (scouts) preceded along trail to the west while the rest of us waited anxiously to see what would happen when this buck was approached. It remained motionless and would have do doubt remained there had the group not employed crude movements and noises to purposely frighten it up the ridge again. Even then it stopped about 20 feet further up ridge to again satisfy its curiosity before finally gaining the other exposure of the ridge to join the main herd. At the second switchback on the west exposure (valley side) could see the entire herd. Being in such an advantagous position carried to observe their actions. The entire herd was enmassed here and represented 9 mammals in number. No doubt the extra four had left their bedding grounds previous to our arrival and had worked around to the west exposure to feed. The hillside they were feeding upon supported artemisia, cliff rose, oak brush and other minor plants. Sex ratio 2♀ to 7♂. The old buck with large horns (a four pointer) dominated the herd and appeared to be directly influenced by the presence of one particular female. Lowering its head and in a high crouched position would approach the ♀ in a bold and striking gait. The female would in turn jump ahead or protect the encroachment. Influenced by the herd he entirely ignored the our presence not being over 250' away and conspicuously stationed. Frequently he would raise his head and sniff the surrounding air, his expiration recorded upon the cold atmospheric and his body steaming from the exciting moments. No other deer in herd showed this steaming of body. This could have either been due to either a physical movement or incidental to the rutting action. I have never experienced a herd of deer in Grove Canyon that so utterly ignored our presence. One other buck was present in herd but offered no competition in the mating game. It possessed malformed spikes about six inches long and made all attempts to keep out of the way of the older buck but the old buck did not particularly mind its presence. The pelage ranged from one extremely dark coat of a single doe, through medium tans possessed by the other does and a truly light tan possessed by the buck. The breathing vents along trail where course crosses around point from west valley exposure to north side of Grove Creek Canyon, were particularly noticeable when the sun shine passed through the heavily laden moisture clouds escaping from them. Have observed a greater vapor condensation from these vents on other

winter trips passing this same point but today the temperature of the escaping air was greater, however, possibly my hands were colder than usual and therefore sensed the heat more than usual. The velocity of the escaping air was sufficient to blow out a match held within its recess. Our next stop was at Calcite Crystal Point just 150' this side of the first spring that crosses trail. Deer tracks in trail entire course covered so far. At spring at 10:06 and found it to be completely frozen over but with a little water flowing beneath the ice coat. All vegetation dead except a few mt. Sawel bushes along its frozen banks. Up to this point found north side of canyon relatively free of snow but south side of canyon supporting a white blanket. Leaving spring we rounded corned, crossed dangerous part of trail and finally reached the slickenside seat on trail above the upper falls at 10:30. Falls ice bound except central flow which however, found a covernous entrance before reaching bottom of falls. No snow north of falls in canyon bottom. Crossover at 10:38 A.M. Ice bound below with all water flowing beneath ice cap, the trail crossing stream frozen tight, but water exposed on steep drop above. First spring intercepted after leaving crossover less ice bound. Second spring completely frozen over but with water flowing beneath. Deer signs still present on trail, their tracks not consistently following along trail but going straight up through fir stand. At 10:55 arrived at Honor Hike Camp at head of canyon. While eating here took temperature at 11:30 A.M being then 54° F. in the shade of the Abies concolor stand. On entire trail up to this point have not observed any other mammal or bird except one small flock of Chickadees in a mohogany grove about 3/4 way up trail and of course the herd of deer at mouth of canyon. At Honor Hike Camp found small flock of about 10 Chickadees in conifers.

Leaving here at 11:40 A.M after finishing lunch planned to go up main valley to the north and place the plague as near to the Am. Fork divide as possible. From the time we left Honor Hike Camp were coping with snows from 1 foot to 3 feet in depth. At 12:00 A.M not far from Camp saw one lone Townsend Solitaire and one Utah Jay in aspens. 12:07 P.M R. Mt. Hairy. 12:25 Got glimpse of large buck standing at upper limit of aspen growth on west side of valley at base of Mohogany Mt. He soon dropped down into protection of aspen trees and in a few minutes reappeared but being preceded by a doe. Leaving their station they worked

up north. ~~East~~ last exposure and finally gained top of Mahogany ridge. the ♀ leading the entire distance. We ceitainly had a reserve seat to watch the ascent. Occasionally the ♀ would jump and bound up the steep grade but the buck was forced to develop nothing more than a brisk run. Both were considerably more nervous than the deer observed this morning at mouth of Grove Creek. Have not run across any more porcupine tracks since leaving the immediate vicinity of Honor Hike Camp and its associated conifer trees. At 1:00 P.M examined a series of Mustates (?) tracks in snow, leading in lanes from one hole to another. Their highway led across the upper surface of snow and would then disappear to reappear further on. I imagine that the sage brush held passages beneath the snow to allow for a disappearance of the trail. The tracks all led to a point of concentration hubbed by a small hole in snow. The main highway led across a gulch and on for 150'. Observed two or 3 other such runways as these but not as extensive or concentrated. Bromptcus, Snowshoe rabbit, chipmunk (?) and weasel were also noticed on top of snow but not in any great numbers. All coyote tracks seemed to be going in a northerly direction up the same canyon we were traversing, coming out of the aspen groves to the east. Would gidge there to be about a dozen coyotes responsible for these tracks These coyotes seem to prefer the more open and exposed valley between Mahogany ridge and Mt. Pumpanagos rather than the steep canyon of lower Grove Creek. Have intercepted many deer crossings and trails where the deer have come from Pump and crossed valley to gain the snow free exposure of the west side of Mahogany ridge. Many trails ascended straight up the steep east ~~exposure~~ side of the valley Mah. ridge. In many places examined the snow had been at one time strong enough to support the entire weight of the animal without breaking through the crust. The further we progressed up valley the fewer deer tracks were observed. Placed plaque in Mahogany tree on east tending ridge leading more or less abruptly into the broad valley head of Grove Creek. The tree is the lowermost tree on the ridge and about 160' up from valley floor at terminal of ridge. Plaque six feet high on N.W side of tree. From our plaque tree one can immediately appreciate.

the possibilities of one of the longest skiing courses in the county. One will be able to start at the divide leading into Am. Fork Canyon and with an uninterupted course, ski practically to the Honor Hike Camp Base at the head of the Provo Creek Canyon Proper, a distance requiring a full day to traverse in ascending but requiring only minutes to descend. The best and fortunate feature about this course is the fact that the dangers of snowslides are practically elimmated, but a course paralleling the greatest mountain in Utah which from its steep and perceptum slopes experiences snowslides and avalanches practically every hour of the day. To enjoy the utmost pleasure of skiing in safety and at the same moment have a reserved seat to observe the natural phenamena of a snowslide is a combination not very seldom duplicated. Left at 5:30 PM and arrived at Honor Hike Camp at 3:20 P.M. after drying water soaked socks, shoes and rubbers of a couple of the members of the party left at 4:05 for car. Spring at 4:23 and car at 4:54. Sun had just dropped below the ridge of west mountains on our arrival at the car. It now remains for the selected group of Honor Hikers to regain this plaque when the rigors of old Man winter are more in evidence than experienced today, and at a time of year when the only possible approach to this area will be with the aid of snow shoes and skiis and equipment sufficient to camp out for one or two nights.

(insert) entered 11/24-38

11/12/38

Collected mollusca today in Preference Spring. This spring which is located north west of town along the Provo River is not recorded upon any available maps so a temporary name has been given to it. As to location one will gain the course by following west on 5th north to a point where rock crusher can be seen along banks of river. From the crusher one can see a swinging bridge across river to the west. It is from the north end of this bridge that specific direction can be given as to its exact whereabouts. If on travels N.W from here he is sure to intercept spring course in about 100' or less. The spring course before it enters into the main creek is only about 80' long. The main ~~sprins~~ creek and Provo River are parallel and this intervening space is occupied by thes Preference spring which recives its name, ~~not~~ in lue of the fact that it preferred to enter the creek course rather than directly into the Provo river 100' to the south. Invasion into the head of this spring could be by the Provo River, main creek which issues farther up river bottom, or from artificial canal which brings water from the main large springs that issue from the base and

581126-309

Provo bench about 2 or 3 miles further up river bottom. This spring (Reference) is permanent and because of its unaltered nature was chosen as a natural setting that had not been influence by man. It supports dock, bordering willow, and at the lower end is choked with algae, and Lemnea. Without effects from any periodic flood the bottom of spring course represent years of accumulation, ~~d~~ nowhere places the muck being 1½ foot deep. Higher upon course, rocks are ~~el~~ exposed & one finds a few ripples due to increased grade. At about ½ way up course, where the stream is not too swift to carry shells further and where the carrying capacity is sufficient to dispose of the mucky condition, one finds an accumulation of 'bone' or semifossil shells. By screening deposits one soon acquires a good sample of ~~stream~~ the molluscan life. The sievings are taken to laboratory & the shells and animal life are properly assorted and after percent frequency is determined, selective specimens are pick and mounted on pins. The species taken from this spring, their relative number, and percent of entire material collected is as follows:

%	No.	name	Relative number
	11th	Euconulus.	rare (1 specimen)
	10th	Cochlicopa	rare (2 specimen)
	2nd	Amnicola	very common
	13th	Gluminicola	rare (1 specimen)
	4th	Pisidium	very common
	5th	Succinea	Uncommon
	6th	Deroeras	Uncommon
70%	1st	Physa	very common
	8th	Lymnea obrussa (?)	Uncommon to rare
	9th	Lymnea palustris	rare. (1 specimen)
	7th	Zonitoides	rare. (2 specimens)
	12th	Oreohelix	rare (1 specimen)

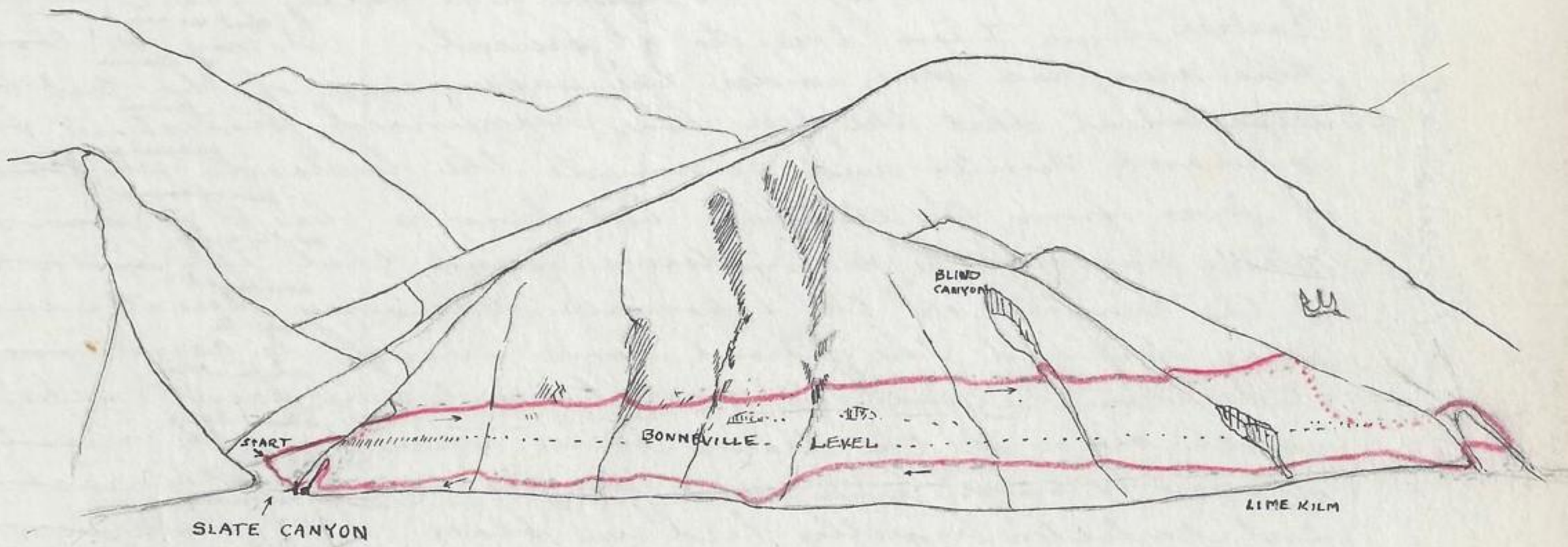
The Physa were the most evident shell in screenings, while the Euconulus was only represent by one specimen.

Collection number	name	Where placed.
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After mounting selected few, culled others and now have them in tubes under the title of Preference Sp. and the accompanying date referable to notes. Will be interesting to compare the relative numbers of samples from the different springs to be worked and particularly to find the factors playing the association or dissassociation with Pinus Ponderosa. All percentages and relative numbers are purely estimates and will naturally stand correction and wide range either side of recorded figure.

11/27/38 Spent 3½ hours in field this afternoon on mountain side from mouth of Slate Canyon, south to canyon above County Infirmary. Followed on a nearly horizontal plane about 300 feet above the upper level of the Bonneville Terrace. Along this route one intercepts many small canyons and numerous rock outcroppings, some possessing the propensities of cliffs or at least ledges. Left home



and drove to the mouth of Slate Canyon and left car just above the erosional dam about 2 blocks up canyon. Before leaving to the south examined the immediate area but failed to find any evidence of mammal activity. Leaving bottom of canyon work up graded trail on south side of canyon. The trail supported snow about 3" deep and ground frozen solid. About 70% of the surface of side hill is covered with snow. The bottom of canyon and north side is entirely free from any snow Even at this time of year this trail is used as a highway for deer as evidenced by the solid and perfect casts of their hoofs Would estimate that possibly six deer had passed along here very

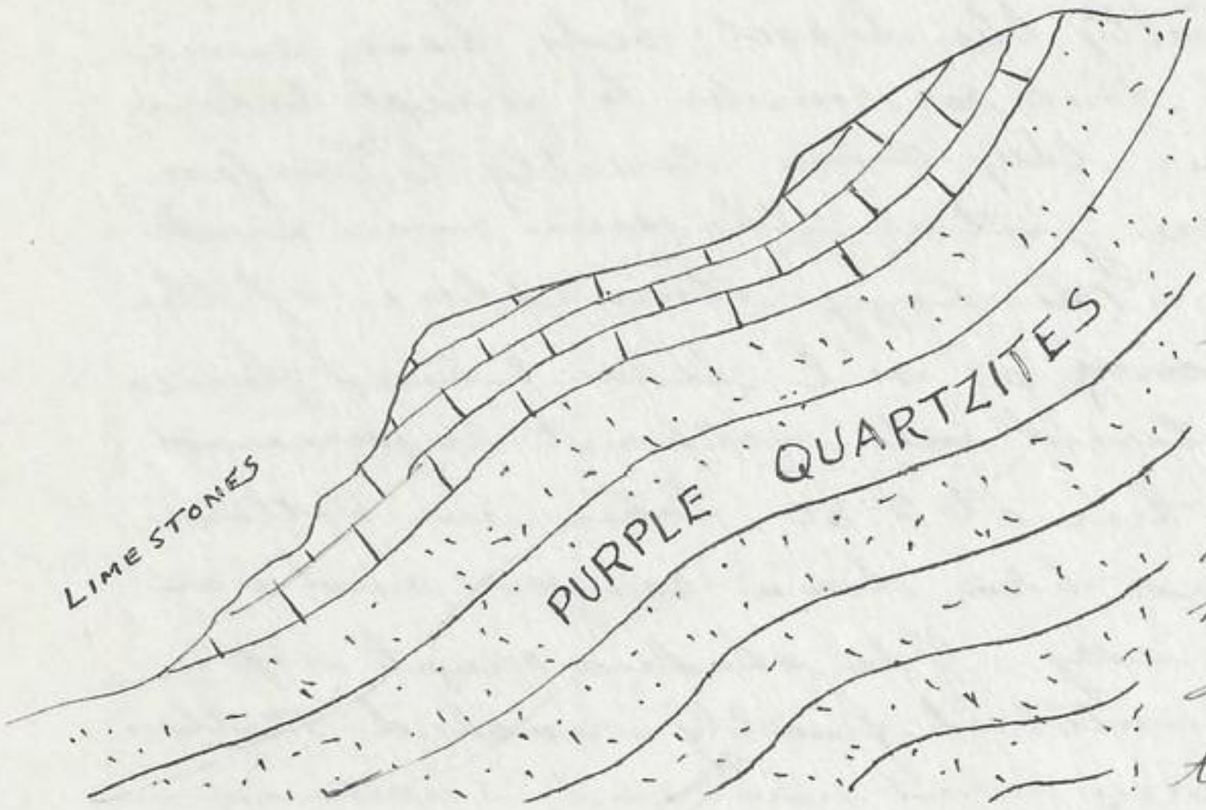
381128-311

recently, all tracks being average in size and indicat
southernly direction of course. Left graded trail at (just)
switchback after leaving canyon bottom and followed (South)
on west exposure at about 300 feet above upper level of (Gingerly)
Terrace. The mountain side is steep and are soon (like ones)
ankles by the continual overturn manner of walking (sandals)
from the continual slipping particularly across this (enjoy the
exposure. Found that the deer had also followed
particular level and again progressed in a southerly direction
Occasionally run across an extra large size set tracks
appeared to be either a large doe or buck.. at one point a
deer had stepped out to the edge of a small ledge and
at the time I stood there thought that this deer presumed
an extra degree of courage. I wonder why these deer are
down so low at this time of year. I have always thought
that possibly deep snows were the deciding factor but in
this case the snow does not certainly play the important
role for the present snow line is high. Practically 3/4 of
mt. exposure is relatively free of snow. However the
nights have been exceedingly cold for the last week or
so and this coldness may alone be responsible for
is also more plentiful higher on mountain side where deer
dead oak leaves, maple leaves, artemesia and grasses are
more prevalent, however cliff rose grows here and may
attract them. I wonder if possibly the deer a hundred years
ago did not normally enter upon the valley floor as much
earlier time than they do at present. that since it may be
this area has gone under the supervision of the Fish & Game
Department ~~that~~ the deer have experienced protection from
guns and hunter and so invade the lowlands because of
of force from the elements but from a lack fear of man
While crossing the many draws found that the north side
of the canyon or the exposures receiving sunlight direct
were dry and the ground loose enough to cause
slide down a foot or two at most any while the
south sides of the draws were covered with about 60% of
of snow or more and were frozen solid with rocks and
dirt particles rigidly held in place. The inter-
ridgetops presented an intergradation, among grading
solid soils bordering the north side of ridge from the
damp soft (not muddy) soil on ridge to the proper
dry soils on the south sides of the ridge. top of
2:18 P.M. did not see a moving thing but at 2:19 P.M.
Cooper Hawk flew over my head and continued to hunt
south along the mountain side. In its hunting flight it
conformed with the irregularities of the canyon sloped
flying up over ridges and down the other side at first
near to the ground at all times. It was using the
same tactics that I was employing in that he was
utilizing these small canyons to make surprise

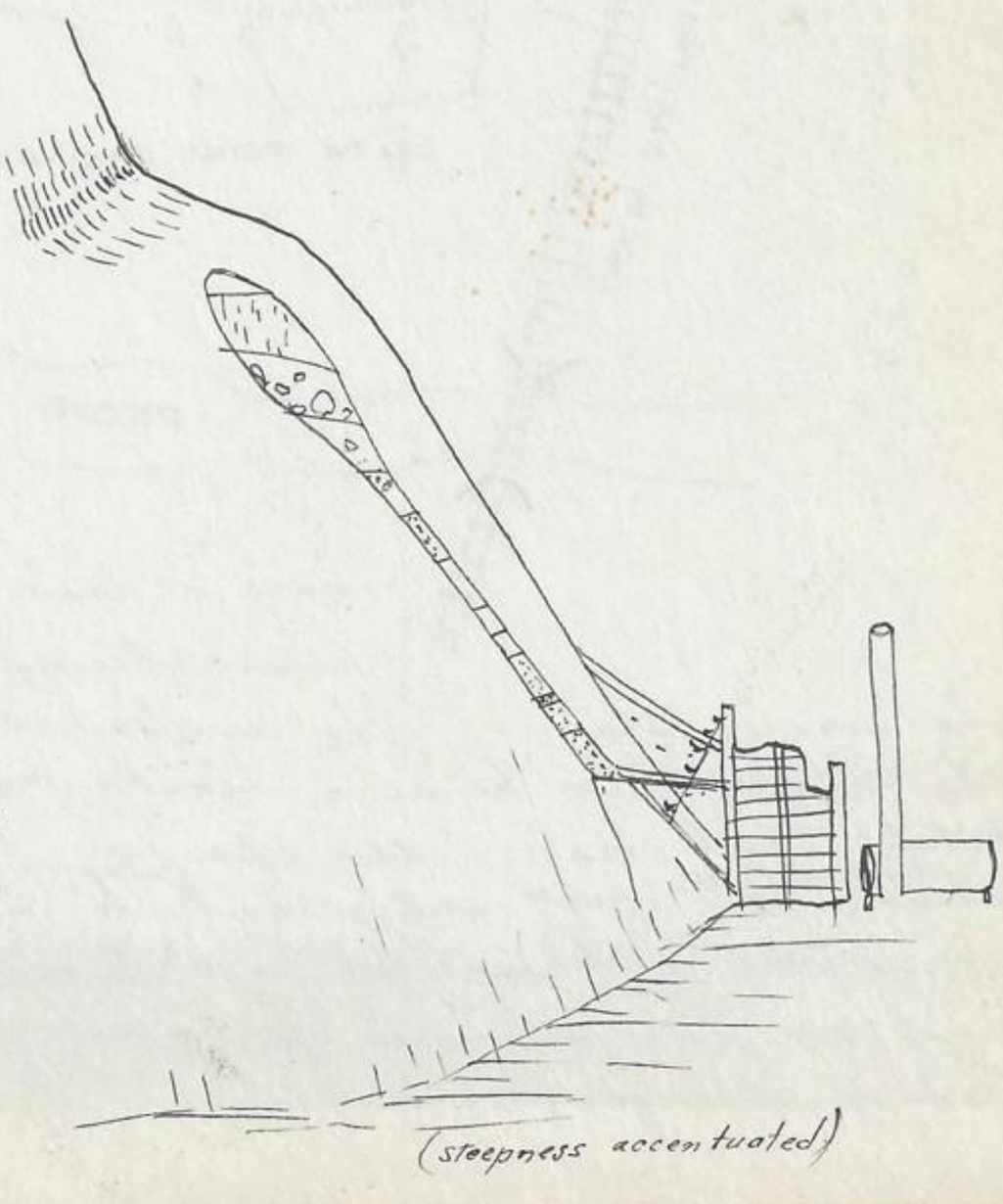
attacks upon the smaller animal life that perchance would be feeding there unaware. Several Juncos (shufeldt)? responded to the presence of the hawk by flying from the ground into the protection of the Hackberry ~~trees~~ and maple trees, offering their alarm call. Two magpies flew across canyon, but at a higher level and continued to fly from canyon to canyon. Recorded several magpies on trip but feel that these birds follow one or rather preceed one from canyon to canyon either as a warning to other birds and animals, from curiosity, from an instinct to hunt together or even from a desire for companionship At 2:20 P.M. made surprise attack on two woodhouse Jays in bottom of one of the canyons. One was setting on the uppermost limb of a hackberry tree while the other was among the lower limbs. The bird perched upon the top of the tree was daydreaming but snapped out of it on sensing my presence. They left without a sound down canyon but returned in about two minutes (could have been two other birds) and lit in trees in same area and progressively made way up canyon by flying from tree to rock to ledge to ground and back to tree again. Saw first Eutamias d. utahensis while setting with glasses focused in the flooded pastures south of Provo near the Bullock Fur Farm. Did not notice it until I was rising from my position whereupon I was greeted with a vigorous warning call not over 30' away. It was about as much frightened as I was upon our meeting It paused for a second on top of rock and then scrambled down hillside to hole under rock about 40' away. At 3:00 met a Citellus variegatus utah not over 25' in head of me. It ran up hill to its den about 15' away Previous to this incident I had stationed myself at the ridge top looking down into where this squirrel was feeding or sunning himself and failed to see it, nor was he evidently conscious of my position up to the time he left for his den. My general ~~policy~~ is to quietly approach the ridge and cautiously peer over top down into next canyon. From a vantage point one can control the entire lay of the land and if one proceeds properly can frequently get a glimpse of the normal and natural activity of the birds and mammals in such natural moods as sunning, daydreaming hunting etc. If after a few minutes I find no signs of activity. I hurriedly cross canyon to next ridge top to inspect the canyon bottom beyond. 3:10 P.M. Canyon Wren crossed path and flew up mt to cliffs, offering as it flew it interesting call. The white throat & upper breast in contrast with the

beautiful rebd of lower belly, back, tail and wings was plainly presented while it watched from top of rock ten feet away. A marsh cruised south just below and all of a sudden whirled around and closing its wings dropped straight down to surface of ground. As to whether it realized its attempted attack I could not say but in a second was observed flying normally along its way, inspecting every canyon in the same manner as the Coopers hawk but in contrast, keeping at a higher elevation and not resorting to surprise attacks.
collected (91438JB) E. d. utahensis in canyon just north of lime kiln canyon. On surprise approach to ridge of canyon it gave out vigorous warning call and ran up hill about 25' and stopped on top of rock to wag its tail overback and to wait its sentence. No other chipmunk was associated with it that I could see. A red shafted left canyon and with advantage of slight up hill wind quickly flew over into next canyon. In about 10 seconds another flicker came flying up canyon and lit in same tree as this first one was resting in. The flickers appear to have more like among the cliffs & rocks than when found among the trees and forests. The numerous hackberrys may attract attract them. Fresh deer tracks still in evidence. One lone robin caught unaware as if dreaming and resented intrusion by fluffing feathers and extending feathers of head. It was sitting in one of the numerous cliff rose bushes that covered a certain portion of the hillside. Later on found main flock of robins about 2 block further on. On arrival at last ridge looking down into the canyon that drains most of the higher country and directly in back of the County Infirmary, found more bird life in numbers than observed on entire trip so far. The most numerous species was the Am. Robin feeding in the patches of hackberry in bottom of canyon at abondoned mine sites. These birds seemed to be in every tree of the hillside. Their general direction of movement was s. e. up the mountain side from the protected groves of hackberry to the open hillsides of oak.
Assocated with these birds were a few Shufeldt Juncos (?) and like Robins were trending in same direction. Would estimate that there were possibly 150 Robins and 20 Juncos. Only one Eu. d. utahensis was observed in this canyon and first discovered about 30 feet from its hole which was in bottom of gully and under large boulder surrounded by tumbleweed and hackberry. This one also gave a vigorous warning call, ran to top of close rock, paused a few seconds before entering hole at base. Observed at 4:00 P.M. Before leaving this canyon on return trip recall of seeing 3 Townsend Solitaire. They were alone and very much alive, calling frequently in the

manner of a Rock Squirrel or Chipmunk and offered their musical song besides. From the last canyon one can see an interesting geological structure on the north side of the canyon. Here the limestones dip to the west and form the surface of the western boundary and are traceable as in this manner. The quartzites that normally underly these limestones are replaced with a more purplish quartzite (?) grading into shales at some points. Did not have sufficient time to determined the possible part that faulting may have played, doubtful if any, possibly.



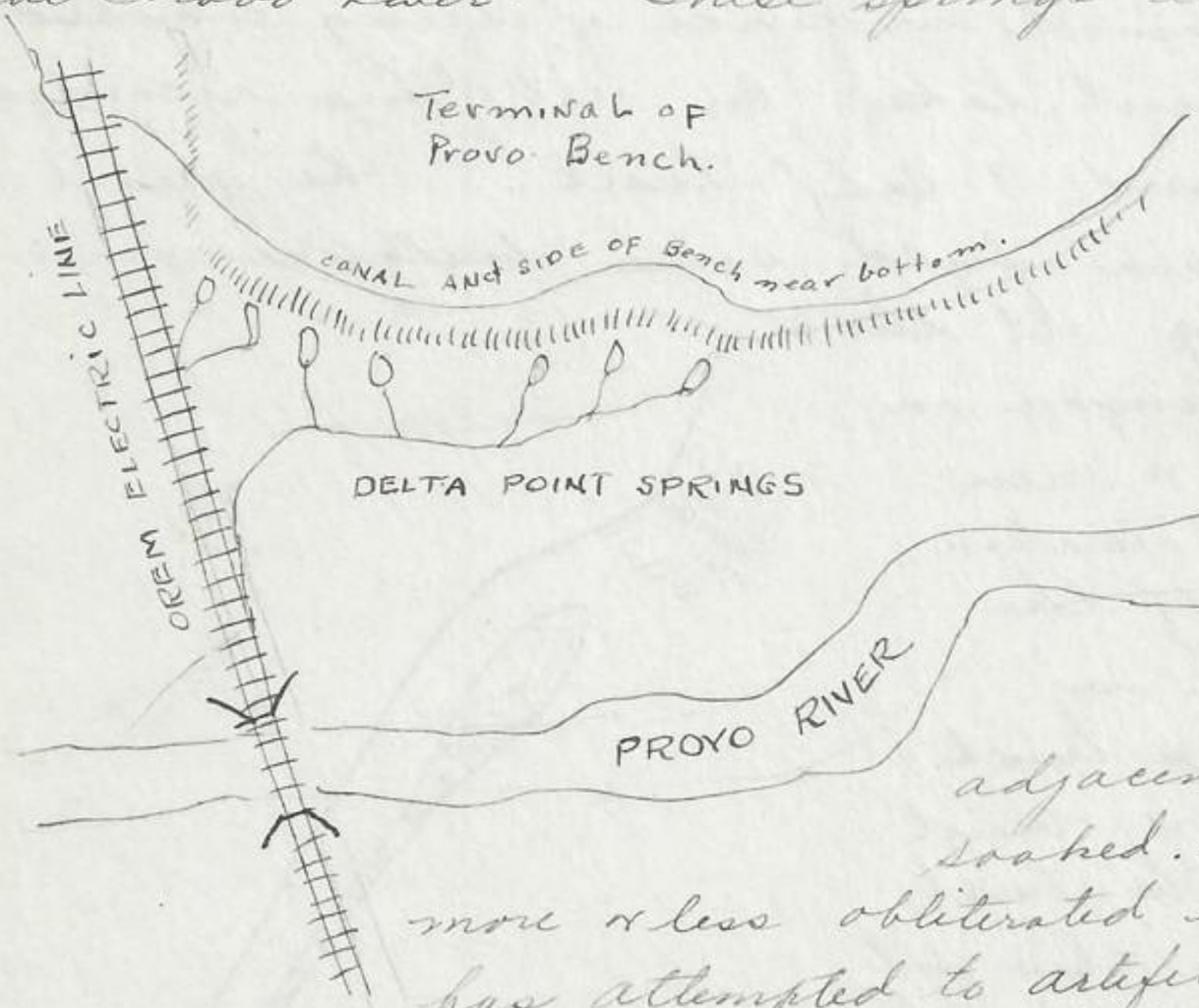
Leaving this canyon returned to car but took alternate route by following at base of Bonneville terrace. At the lime kiln excavation noticed that the surfaces of the rocks and cliffs where the old Bonneville sediments had been removed were smooth and showed evidence of being washed by water of the ancient lake. On rest of trip recorded one Spurred Towhee and 9 Calif Quail. The quail were flushed from open field some distance from any protective covering. At the mouth of Slate Canyon on the south side, is a new gravel pit now in operation. The entire heighth of the Bonneville Terrace is scarred with a deep trench and the strata are beautifully exposed on the abrupt side walls. Before this pit is destroyed it would be very desireable to record the entire sequence of these layers from top to bottom of terrace. The best method would be to graphically photograph the entire series in small enough sections so that the gravel constituents could be



38 | 28-315

plainly determinable. At 5 or six feet from bank would be sufficient distance to record formation in a general way. The structure & dip of foreset, topset ele beds should also be included in the work as well as a sample from each stratum. I know of no place where the entire sequence is so completely presented. The lower beds are dipping in opposite direction to the foreset beds. Evidently the topset beds have, since their ~~deposition~~ deposition upon the outer beds, that are counter to foreset beds in dip, have been eroded away because they come directly to the surface. Arrived at car in canyon at 5:20 p.m. just as the sun was sinking below the western mountains. The hazy atmosphere of the valley was responsible in producing a veil like colored glasses on which the red sun could be starred into without injurious effect upon eyes. Temperature here at 5:30, taken in bottom of canyon was 29° F. A cold wind blew down canyon and was incidental to sinking of sun from sky. The shadow crept up mountain side as for 10 minute until it finally reached Mother Luna's nose. Days appear to be very short now and there is hardly enough time between sun up & sun down to allow an annual to warm through.

11/13/38 (insert) entered 11/28/38 (not in proper place in journal) Collected sample Mollusca in Delta Point Springs today. Delta point springs are found issuing from the base of the terminal part of Provo delta on the Provo River bottoms. Can be seen from point where R.R. crosses the Provo River. These springs evidently come from base of delta due to a hard pan below at least they all issue from about the same level at the very base. At present they are crowded with Lymnea. The adjacent areas are water soaked. and stream course more or less obliterated except where man has attempted to artificially drain them. The sum total of the water is escarted by way of a ditch to the Provo River some 2 blocks away. Selected site in main ditch that drains the springs to the east. at a point where stream ~~is not fast~~ is not fast enough, carrying capacity sufficient, to carry shells further on down. These spring are quite isolated and do not have as good an access to Provo River as Preference Spring not far from here. Black will be around heads of springs.



381128-316

% or prevalance.		Name.	relative numbers
	8	Cochliocopa	rare. (2 specimens)
	9	microphysula	rare - (1 specimen)
	4	Amnicola	common
	6	Gyraulus	common (less degree)
	2	Stummcola	very common
	3	Physa	very common
	5	Succinea	relatively common
60%	1	Physa	very common
	8	Vertigo	rare (3 specimens)

Collection numbers	Name	Where placed.
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Remaining shells referrable by name of spring and date. These remains are selected and stored in small tubes. No Euconulus Zonitoides, or Discus, Lymnea, or Oreohelix were found in sample. Gyraulus present here but not in Preference Sp. Physa microphysula here but not in Preference Sp. Vertigo peculiar to this spring

11/28/38. Took sample collection from the sand beach of Utah Lake at a point about 3 blocks south of where Provo River enters lake. On this wind blown shoreline, about 300' from present position of water screened several area for representative series of molluscs. The wind has blown off the superficial layer of sand and has exposed in many area an almost white field of shells. Many of these shells are fossil and fossil a great number has beenbrought in by Provo River. The number shells seems to be equal wherever one examines the shorelines of Utah Lake. This area is representative with possibly a few foreign species from the mouth of Provo River which certain has included among its debris, shells of waters foreign to the lake. The precent prequency of these shells is not segnificant

381 128-311

because of the possible sorting and grading of shells by the action of the wind upon the sands - but have included it as it may later prove to be segnficant and to use as a comparison with other areas.

%	x prevelance.	Name	percent frequency
1	69%	Spharium	very Common
2	12%	Elummicola	very Common
3	1%.	Petged shell	common
4	3%.	Fisidium	common
5	2 1/4%.	Carinifex	uncommon
6	1 1/4%.	Gyraulus	uncommon
7	1 1/4%.	Amnicola	uncommon
8		Lymnea	(1 specimen)
9		Physea	relatively rare.
10	1/4%	Anodonta	rare
11		Heliosoma	(rare per area examined)
12		Orecbelix	rare (1 specimen)
			rare (1 specimen)

The Sphaerium, Elummicola, and Carinifex appear. because of of larger size to be the prevalent species but on closer examination one finds many of the less conspicuous one in greater number. The Anodonta & Lymnea are present in good numbers but one must cover many times more surface area to find them and so have considered them rare, at least rare in the selected areas studied.

Col. no.	Name	Remarks	Col no.	name,	Remarks.
1			26		
2			27		
3			28		
4			29		
5			30		
6			31		
7			32		
8			33		
9			34		
10			35		
11			36		
12			37		
13			38		
14			39		
15			40		
16			41		
17			42		
18			43		
19					
20					
21					
22					
23					
24					
25					

38:200-318

12/6/35 Prepared series of 28 mollusca on gems, collected in 1935 from the Provo level deposits of the ancient Lake Bonneville. The delta accumulations are found 2 blocks north of the Knolls which are, in turn, located near the Heronery about 4 miles south from Pelican Point on west side of Utah Lake. The intervening area between the Knolls, which are on the lake shore and the main mountains to the north and west was covered by the lake when at the Provo level stage. Leading down from one of the canyons, across this stretch of alluvium is a deep erosional canyon or gulch which, upon its newly exposed walls a stratigraphical record of the deposits were very beautifully ~~expose~~ recorded. It was from a pure culture about 1/2" thick and 12' below the surface of the present top of gulch that I acquired a hand-full of shells. Five species are represented. Percent frequency noted and merely represents a crude estimate.

15% Carinifex
8% Fusidium c.
60% Amnicola
5% Lymnea (large)
15% Lymnea utahensis.

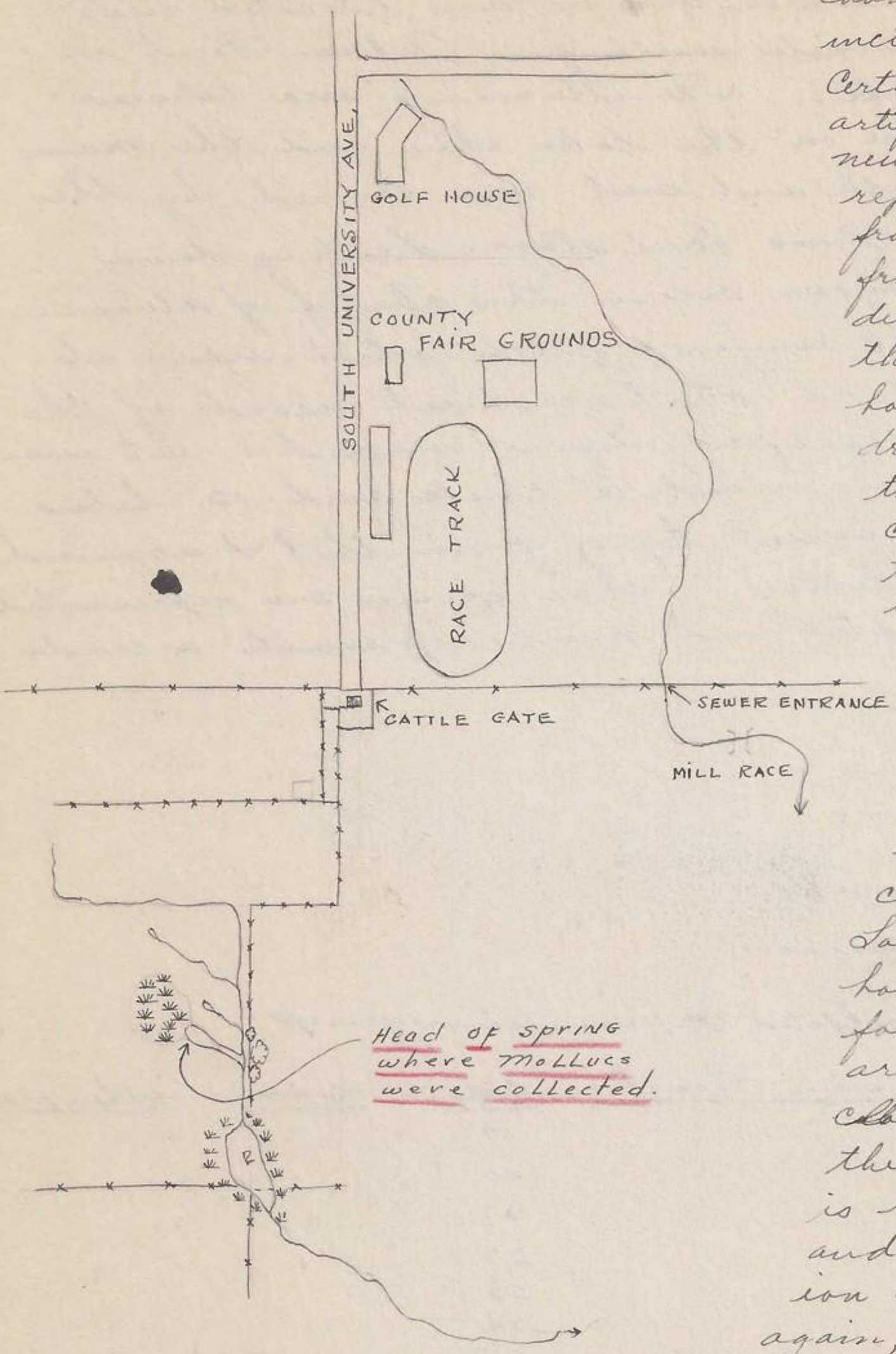
From the shells selected representative group.

Col. No.	Name	Where Placed.	C. No.	Name.	Where placed
1			19		
2			20		
3			21		
4			22		
5			23		
6			24		
7			25		
8			26		
9			27		
10			28.		
11					
12					
13					
14					
15					
16					
17					
18					

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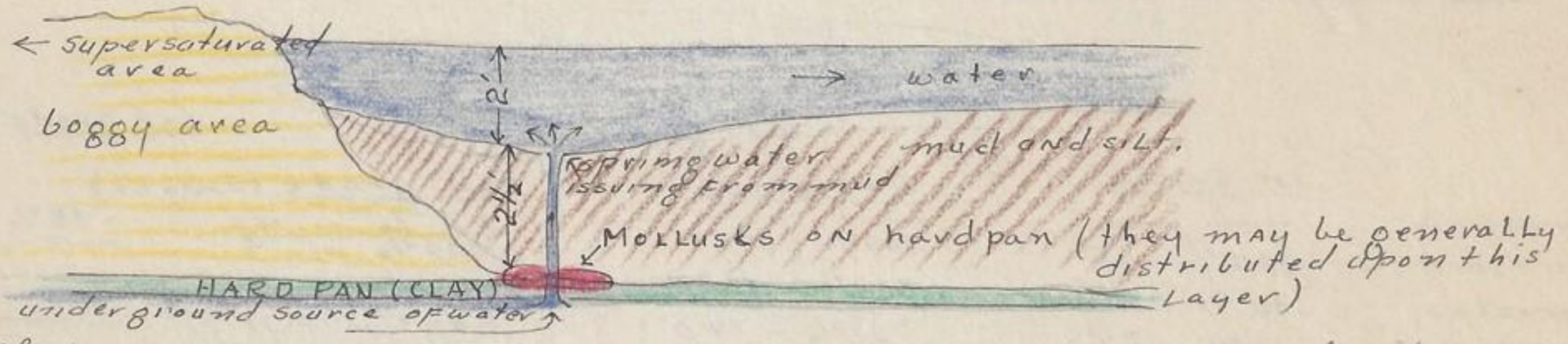
11/21/38 1 Collected snails in First Hard Pasture, just south of town. These pastures have been grazed by cattle since early pioneer times with a resulting change of vegetation surrounded incidentals to pasturing. Certain area have been artificially drained, new sources of water replenish normal supply from the ~~the~~ waters issuing from terminal city ditch systems, but on the main the spring have not suffered any drastic changes, changes that would shut off connections with either the mill race or the waters of mud lake.

Entered 12/7/38



This spring water noted flows to mill race some 4 blocks away, hence to Mud Lake, hence through channel to Utah Lake. (Provo river may have, in prehistoric times followed through this area, but now the closest connection to the Provo River source is via of the mill race and possibly the irrigation channels. This area again, no doubt has been flooded by mud lake at some time or other. The area is typically a lake bordering ~~marsh~~ grass land with numerous boggy and marsh areas supporting many fine springs. The single spring examined evidently drains the supersaturated and boggy area adjacent to it. The water from this saturated area finds its way to the head of this spring, not by surface flow but by underground flow. At the head of this spring there is a good flow of water issuing from the bottom of the spring in two or three places. Spring about 20' wide from end of source to where it enters an artificial drainage ditch. Water 2' deep, mud 2½' deep. north & west bank boggy, south bank

firm. With waders on, my first attempt was to collect a few snails that were exposed by the action of the bubbling ~~spring~~ water from the bottom of the spring. The procedure was very risky, particularly so in being alone in a mucy and boggy situation. I was already drawing about four feet of water when accidently I stepped in the center of area where water rose from bottom of spring. The hardpan 4½ feet below surface of spring averted the disasterous possibility of sinking out of site, or at least receiving a proper babtism. As it was I still had 2 inches to spare before the wader would sink below. These 2 extra inches may have save me from receiving a soaking but would they allow suffecient leeway to work the muds below. As graphically pictured by my feet below, reconstructed this cross section of pond. My first knowledge of their presence was the crushing of shells as I stood upon the hard-



pan, clay They appeared to be mainly confined to hard pan or possibly resting upon it. Could not determine whether shells were genrally distributed upon this hard pan or were concentrated here as a result of the action of the underground water passing up through the mud and more or less keeping an open passage for the mollusc to find access by percolating down from mud above. I am of the opinion that this hardpan is widely distributed and the molluscs are generally distributed upon it. I determined snails on the hardpan here, only because it was the only place I could reach it while wading about the spring. Could this level be a former lake bed or bottom of old stream channel that has since been covered & silted? The proceedure used to acquire samples of these snails ~~beloa~~ was to dig the tip of the toe of my wader into the hardpan below, then by carefully raising my foot drew the contents to the top of the mud whereupon ~~finished~~ ground with a hand strainer ~~strainer~~ dentitd little pay dirt remain upon my boot toe. By bring the strainer and snail dirt to surface of water

and by washing the muddy matrix from shells, produced a sample of beautiful molluska. I did not have to repeat this stunt many times until I had practically a full quart of assorted snails. All snails collected, except a few on surface of mud, from about 2 square feet of surface of hard fan. After collecting sample of Ricca from surface of pond label (2) which litterly covered the entire exposure left for home and upon arrival proceeded to take care of material. After floating off the vegetative debris, which was very little, found that I had practically a pure culture of snail. After drying overnight, assorted them with different sizes of screens into specimens of the smallest grade averaging 2 m.m in size, of the second grade of 4 m.m in size and of the third grade from 6 m.m - to 20 m.m in size. Frequently small specimens would be found in larger grade. From the several grades took samples as representative with the idea of determining the percent frequency and dominance of the different species.

Occurrence of Species (by grade)

	1st Grade	2nd grade	3rd grade (SmaLL)	3rd grade (Large)
Lymnea	——— ———	,206% — 68	.05% — 41	.18% — 23
Pisidium	.325% — 65	.309% — 128	.034% — 9	———
Gyraulus	.20 % — 40	.121% — 40	.027% — 7	———
menetus	.17% — 34	.018% — 6	.042% — 11	———
Heliosoma	.095% — 19	.066% — 22	.12% — 30	.05% — 7
Ridged Lymnea	.085% — 17	.106% — 34	.06% — 15	.038% — 5
Valvata	.045% — 9	.06% — 20	———	———
Physa	.035% — 7	.006% — 2	.54% — 141	.71% — 93
microphysa	.03% — 6	.015% — 5	———	———
Vertigo	.02% — 4	.006% — 2	———	———
Succinea	——— ———		.023% — 6	.015% — 2
others				

Species Percent frequency of total grades

Physa	.336%	1
Pisidium	.265%	2
Gyraulus	.161%	3
Lymnea	.115%	4
menetus	.103%	5
R. Lymnea	.077%	6
Valvata	.07 %	7
Heliosoma	.05 %	8
microphysula	.018%	9
Vertigo	.017 %	10
Succinea	.014 %	11.

Specimens in collections.

Col. no.	Name	Remarks.	Col. no	name.	Remarks
1			62		
2			63		numbers to 75