

JOURNAL

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W. B. B. B.

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1902.

1902 Washington to Jefferson Texas

June 6. - Left Washington at 4:15 P.M.
B + O for Jefferson Texas. via St. Louis
+ Zerkana.

June 7. Reached St. Louis at 4:45 P.M. &
left at 8:20.

June 8. Daylight at Little Rock, Arkansas,
reached Zerkana about noon &
Jefferson at 2:10, Sunday.
Tramped many miles over the country
but found little sign of mammals.
Made lists of birds & plants.

June 9. Met Hollister at 10 AM train
& ~~afternoon~~ got a horse & drove
a mile down the creek to the farm
of Richard Crane & arranged to
come down & camp in his cabin.
Returned to take to noon camp tonight

June 10 - Engaged a team to take us
down to Crane's early, but two
funerals took all of the teams &
people of the town until afternoon
so we could not get off till 1 P.M.
Reached Crane's about 3 & located in
cabin near the Creek in edge of
corn field. Set traps.

Jefferson

June 11. Tramped many miles through cypress + pine + oak forests that have never been touched by fire or ax - contain much valuable timber. Crossed numerous bayous + followed the shores of ponds + swamps.

Found cattle + horses + logs but no signs of road or human habitation. No signs of wild mammals except coon + possum tracks, which are numerous. but lots of birds, water moccasins, turtles, frogs, + lizards - Chameleons, Sceloporus, + Euneces.

Mosquitoes are numerous but seem to be the usual kind - very small - not vicious. No Anopheles. We got covered with chiggers + both Holtherr + myself are a mass of spots + bumps. The burning + itching is intense.

The weather is fairly hot - probably 90-100, + very humid. Our clothes are soaking wet all day + do not dry at night.

In P.M. took 8 photographs + set wire traps + shot 2 bats.

1902

Jefferson

June 12. Found nothing in our traps. Shot a Pilicosted woodpecker & made up our bats. Set a few more traps. & in P.M. while Hollister set traps in woods for *Peromyscus* etc - I returned to old fields on the road back toward town to set traps. Had a hard 10 mile tramp but found some good places.

June 13. Went to my traps & found 2 *Microtus pinetorum* & Hollister caught a *Perognathus paradoxus* & *Peromyscus gossypinus*. Mammals are very scarce here, probably owing to the flat country that at times is largely flooded or very wet.

June 14. - Packed up & got an early start for Jefferson picking up my traps along the way, but missed the 10 o'clock train south, so waited till 2 P.M. for train to Marshall. Arrived at Marshall in time for Hollister to set out a line of traps but I felt too weak after a hard chill & fever last night to go out.

Marshall

June 15 ~~Marshall~~ is an open, hilly country of red sand mainly, some clay & shale & iron rock in places. The clearings, pastures & fields cover more than half of the country so it appears like rolling prairie with timber strips here & there. The timber is small and mainly scrubby but with some good sized old trees. The pine is mainly nut. Oaks & gum & hickory form the bulk of timber.

The great number of abandoned farms gives the country more of a prairie look than it would have. Cotton & corn are the regular crops.

At a dammed pond a mile from town we found Redwing blackbirds breeding in the cattails, & big Nelumbo luteum growing. Found a quail's nest nearly completed with the old birds at it.

Hollister set out a line of traps but I felt too weak & miserable to go out, so wrote reports.

Marshall to Shreveport

Jan 16 - Felt better this morning & went

out with Hollister to take up his traps. Got nothing, but took some photographs.

At 4:20 took train for Logansport via Shreveport. Was surprised to find the country from Marshall to Shreveport an open, half prairie region of scattered, low timber & grassy swells. Many of the open places seem to be old abandoned fields but grown up to native grass & some times to scrubby pines. Some warbs & runs & cat tail patches & one lake were features of the country. In several places patches of a large *Liatris* were seen.

A few little towns & good farms were seen but most of the country has a neglected, abandoned look.

Crops are rather poor & the soil is sandy & apparently needs fertilizing. Stock is scarce & poor.

Left Shreveport at 11 PM & reached Logansport about 1 AM.

1902. Logansport & Joaquin & Simpson

June 17. Woke up in Logansport on the east bank of the Sabine River. Got mail, tramped in woods for an hour & concluded the place did not promise well so took the 9 AM train for Joaquin, just across in Texas. Left Hollister there & went on to Simpson to see what the country was like beyond. Found nothing promising so decided to return to Joaquin. Took a few photographs of woods at Simpson, & wrote until train time. The country is mainly timbered with many fairly good farms & lots of cotton growing. The soil seems good & crops look better than farther north. The timber is essentially the same as at Jefferson. No *Pinus palustris* has been seen yet. There are sawmills at most of the towns and a good deal of lumber comes in from various places. Some good pieces of standing timber seen with good sized trees of *Pinus mitis* & *tda.*

Joaquin

June 18 + 19

Hunted + trapped at Joaquin but without much success. There are no prairies + very few woods except rabbits + squirrels. Halstead caught some *Reithrodontomys* + a little *Blarina*. We got a few birds, lizards etc.

Chiggers are extremely numerous + troublesome, also fleas + B.B. in the house -

June 20 - Went SW on the Houston Shreveport R.R. to Leeskin without getting much change of country. In the *Nacogdoches* region it is more hilly with red soil. The whole way is forest, heavier on the bottoms + thinner + more bushy on the hills. The red soil is better than the sand + raises better crops of corn + cotton. It is stony in places with a shaly iron rock.

Saw some tobacco fields + took on one car load of *Storax*. A hot day, very dry + dusty.

Lufkin to

June 21 Left Lufkin at 7:45 A.M. and had to wait at Huntington for Beaumont train till 10.

Lufkin & near Huntington are in solid forest of good timber from which the best lumber pine has been cut near the R.R. Some reserved patches are full of good trees yet. No new species noticed, practically the same set of trees as at Joaquin & Jefferson. Flat country & good soil but not many farms.

Half way between Huntington & Zavalla the first P. palustris was seen & it soon came in as a forest of magnificent trees, large & close together with trunks 2-4 feet in diameter & 80 to 100 feet high, branched only at the top. In places it stands with at least 20 such trees to the acre, forming a clean, open forest with only grass below. Again it is mixed with other timbers, but forms the dominant forest tree to edge of coast prairie 15 miles north of Beaumont.

It reaches its perfection on the flat land with moist, sandy or clay soil. A great part of the best timber has been cut along the RR & big sawmills are located at almost every station. Only in reserve spots has it been kept untouched. Generally it is all cut including the small trees for tissue, then the ground burned over. Some has been cleared & cultivated but not much & the soil is poor generally where the timber is good.

Near Rockland the country becomes hilly with much rock cropping out, apparently limestone. There are numerous springs & charmed & grassy runs. There are open grassy slopes and thickets & bottomland forest & a variety of trees & shrubs - mixed in places with the long leaved pines or alternating with it. This kind of country continues to Warren & is worth working.

At about 15 miles north of Beaumont we strike the big prairie region with its patches of live oak, long grass, + palmettos. The Motts are a conspicuous feature of the prairie, mainly made up of live oak.

It has tried all day to rain but only succeeded where we were in giving us a few sprinkles in the afternoon & a fairly good shower in the evening at Beaumont. It is much needed. The corn is drying up & is already nearly ruined for want of rain & the cotton needs it badly all over eastern Texas. It has been very hot & dry & dusty for weeks.

Beaumont is a big, booming town, swelling of oil & generally unattractive. It is on the midst of the big coast prairie.

June 27 Beaumont to Sabine & back

Low prairie running into salt marsh near the coast. After passing the oil wells the rice fields extend for miles over flat land, flooded by canals. Then the salt marshes begin. At Taylor Bayou we come close to the coast and of the lake - close to Port Arthur. It lies in good salt marsh country but not much good for trapping.

The little woods over prairie near Beaumont promise the best ground for mammals.

Flocks of blackbirds, redwing & quail are numerous over the rice fields & along the bayous. Meadow larks, cranes & other waters are numerous - See list of birds.

Found a comfortable hotel at Sabine - The Windsor & met several Goot. men - one in charge of the life saving work & a collector of customs - Mr. White, both of Washington. Took a few photographs & returned on 3:45 train to Beaumont. & went back to the Crosby Hotel.

Cool & delicious all day.
Narrow roads on prairie.

Bramont to Houston

June 23 - Left Bramont on S.P. at 4:52 and reached Houston at 9:45. Had a delightful ride over cool, breezy prairies.

The whole way is prairie except for strips of timber along the several streams and here & there groves or "notches" of various kinds of trees. I should say that 3 fourths of the way was prairie. To the north & south the sky often meets the grass, but nowhere were we entirely out of sight of timber.

The prairie is flat & level with numerous ^{little} mounds scattered over the surface on the dry part. A great deal of it has been made into rice fields & the growing grain now stands 4-10 inches high. Most of the rice fields have been flooded from the big canals & the water is running in the ditches. They are especially attractive feeding ground for Green & little blue herons, clapper rails, blackfeds - redwing & big grackles, & the meadow larks are abundant about them. Rice is the principal crop of these prairies. A few other things are raised on the

higher ground near the settlements
and in places herds of cattle were
seen, but the greater part of the
prairie is uninhabited, & undeveloped.
A rich growth of various grasses cover
it and a few herbaceous or slightly
shrubby plants flourish. At present
there are few flowers, Rudbeckias are the
commonest, the big coneflowers have
mostly gone to seed. A large purple
flower is conspicuous in places &
a big white wallow ~~was~~ is common
here & there. - See list of prairie species.

The timber is all in groves
or bunches or else on the stream
bottoms. The groves are often of oak
or again of pines (teda + mitis) or
sometimes mixed pines + oak + sweet
gum & other trees, all loaded with
Spanish moss. Along the streams
are various oaks, pines, gum,
cypress, magnolia, persimmon,
~~cypress~~ sycamore, & various vines
& in places palmetto. See list of trees -
At one place just west of Sour Lake
I thought the pines were palustris but
they were scrubby & may be teda.

At Houston I got horse + buggy
+ drove out 5 or 6 miles onto big
prairie to NW + took some photos
of the prairie + surrounding strips
+ groves of pine + oak woods,
with just prairie grass + composites
+ rudbeckias in foreground.

Also some good views of oaks
+ pines hung with Spanish moss.
Had a little visit with H. P. Atwater

I was surprised to find a family
of old + young scissortail flycatchers
at home along the fence on the prairie
and for the first time on this trip the
Chondestes were common.

A single scrubby tree of *Prosopis juliflora*
was seen in the edge of town +
several *P. pubescens*, small trees that
I suspect had been planted, but as
they were doing well + bearing beans
they suggest a dryness of climate
not found farther east.

Houston to San Antonio

June 24 Left Houston at 10 & reached San Antonio about 6. Rode all day over beautiful prairie with only here & there strips or patches of timber along the streams until we reached the Colorado R. when a scattered, scrubby growth of mainly live oak, post oak, & black jack & farther west mesquite forms a half timber, covering the rougher & more elevated regions. Almost all the forenoon we rode over beautiful prairie often without a tree in sight.

The country grows steadily dryer from Houston west. The last pines (*taeda* & *mitis*) were seen a few (probably 6) miles west of Houston & so Liquidambar were noted west of the Brazos, Hercules were abundant west of the Brazos & an occasional mesquite seen.

West of the Colorado the country became much dryer, grass shorter, crops poor or entirely dried up.

At Flatonia the aridity became more evident, mesquite becoming common & the grass more in bunches & crops an almost total failure.

But not until we reached the Guadalupe R. did we strike the full set of desert brush. Cordoba, Zizyphus, Lyppia, cactus, yuccas etc. The same as at San Antonio.

I should draw the dividing line between humid & arid - mesquite & not mesquite regions - at Flatonia. Others might decide on the Colorado R. or the Guadalupe but about Flatonia seems to me the average of extremes.

Much cotton & one large region of sugar cane (east of Richmond) and some rice fields were seen by the way, also corn, but everywhere they all suffer from the unusual drought and west of the Colorado River most of the crops are entirely ruined. Even the grass is dry & in many places it was burning. At Glidden I saw the grass beside the train burst into flame from the engine sparks & before we were out of sight it had spread over several rods of grass.

June 25 to Center Point.

Left San Antonio at 9:15 AM.
Reached Centerpoint about noon.
The country is rough & hilly
& stony with ledges & cliffs along
the gulches & streams. The stone is
horizontal limestone that has been
cut out by erosion, leaving many
flat topped ridges & buttes & long
terraces. Narrow valleys lie along
the streams and most of these are
occupied by ranches. Where not closed
both valleys & ridges are narrowly
covered with scrub oak, juniper
& ^{such} low scattered timber. The little
walnuts, sycamores & cypresses
grow along the streams.

There have been no rains for
weeks & the country is all dried up.
All crops are injured & many ruined.
But they look better up toward
Centerpoint than in the San Antonio
region. Grass has turned brown
& the country looks barren & bare.

The rivers are very low. No rain for a
month & not much in winter.

Center Point

June 26. Took photographs, wrote letters and worked on getting outfit together. Collected specimens of the Cypress along the river, as I suspect it is a good subspecies. It has no knees, the base of the trees spread low near the ground with gnarled old roots, the bark is whitish gray instead of red. The trees have wide tops & very long branches which probably is the result of their isolation. The fruit is usually small, but varies greatly in size. Some of the trees are 6 to 8 feet near the ground & 4-5 feet through above the bulge, 10 feet up, & 70 or 80 feet high. Many small as well as large trees grow along the river. The flood last year tore down some of the largest trees as well as small ones & left logs lodged in the branches 40 feet from the ground. The photographs will show the general form and manner of growth of the trees.

A warm day, but fresh & breezy. Thermometer on cool side of P.O. stood at 100° all the afternoon - was 99 at 6 o'clock.

Center Point

June 27 ~~28~~ - spent most of the day writing, took some photographs, and got part of our camp outfit.

June 28 - Loaded up & started for Kerrville, followed up the valley on north side of Guadalupe R. among the farms good road, but dusty & the country very dry. All kinds of crops suffering, but wheat & oats have been cut & were fairly good crops. The corn will yield part of a crop & if rain comes there is still hope for the cotton.

Stopped at Kerrville & got our supply of grub & what camp things we had not previously been able to get then followed up the Guadalupe River 3 miles & camped at the ranch of a Mr. Moore. The Guadalupe River is here very low, with rock bottom & Cypress trees scattered along the shores.

A heavy thunder shower in evening came just ~~to~~ us, raining a few big drops, but raining hard east of us. Another distant storm in the west ~~may~~ have covered some of the country ~~in~~ going west.

June 29 Sunday - Sent Swiber over to the Verde Valley to get Cary but he met Cary coming over & so got back before noon. Went to post office for mail, set a few traps & got Cary straightened out on his cataloguing & labeling.

A hot day, not much accomplished.

June 30 - Moved camp 3 miles up the river to a place a mile below the village of Ingram and 4 miles above Kerrville. Camped near the river under walnut & oak trees with rows of big cypress just in front of us & big hills & cliffs across the river.

In afternoon rode out my mouth's acet & returned to Kerrville to send it & do some other business. Did not get back in time to do much other work.

Cary remained at camp, shot birds & made up skins & set traps.

Over to Layup ranch.

July 1 - Took my saddle horse & started over to Layup. Went a mile up river to Ingram & then followed up Indian creek about 3 miles and then over the ridge some 3 miles farther to his ranch. Layup had gone to town so I returned but saw some interesting country, got good notes & a few specimens. Am now than ever satisfied of the upper Sonoran character of the top of the ridges, both from absence of mesquite & lower Sonoran species & the preponderance of dwarf & small oaks - & other species not found below - see lists.

Forgot to carry aneroid but should guess the ridge to be 1000 feet higher than the river at Ingram.

The whole country is horizontal line rock, cut out & left in cliffs along the streams, stony & rough everywhere except also in patches along the stream valleys which are all under cultivation. The ridges have good grass & are good stock range where not too

brushy & timbered, but the grass does not support a great number of stock & makes rode life miserable to every thing in the woods & brush.

Found it delightfully cool & breezy over the hills, but water is scarce. Indian Creek is dry except for pools here & there. A few springs are still running. At one point, where the road leaves Indian Creek, many springs come out of the bank & trickle down over the lime rock & lime encrusted bank, and on these wet, shored banks masses of the most beautiful ferns & mosses grow & are reflected in the pools below. The vegetation is dense & the little canyon seems like an eastern glen but its sides ring with the song of the canyon wren & black headed rock squirrels sit on its rocky walls. The wood pecker however I suspect is C. virens but I failed to get it or the little Empidonax.

Ingram

July 2 + 3 Caught *Neotomas*, *Peromyscus*
+ *Mus tectorum*? in drift along river flats.
Birds are numerous along river bottoms.

July 4 Gordon Donald arrived
but returned to Kerrville to
take back his horse + we will
go after his outfit in morning.

July 5 Bought 2 more saddle
horses + took them to town to
be shod. Got supplies for the trip
+ brought Donald out to camp.

July 6 - Sunday, wrote reports
+ packed up specimens to
send in morning + got ready for
a start up the river tomorrow.
Barometer read 1760 at Kerrville,
1860 at Camp - 2060 on hills
across river!

Ingram to N. Fork Guadalupe

July 7 - Left our camp below Ingram and followed up the north fork Guadalupe R. past Japonica + about 15 miles farther west + camped where the big springs boil up in the river bed. With Herowilly as a base at 1660 feet altitude and our camp at 1760 we reached the 2000 foot contour at a second fork of the river about 7 miles west of Japonica just where the last cypress were seen + where the mesquite, pican, Berberis triplida + other Lower Sonoran plants end or become scarce. The 2000 foot contour seems to be the zone line.

Junipers + oaks are the dominant trees above, but a few scattered mesquite, Berberis, Opuntias, Yuccas and other Lower Sonoran things occur along hot slopes.

The country becomes higher, more rocky + more uniformly timbered with shorter, more scrubby growth. The rock cliffs + canyon walls become lower + the valley bottoms less extensive.

The river becomes clearer + purer + the weather noticeably cooler as we rise. At noon stopped for lunch just west of Japonica + got fox + rock squirrels.

N. Fork Guadalupe to

July 10 - Left our camp on N. Fork Guadalupe R. (15 miles West of Japonica) at 9 A.M. & followed the ridges ^{west} just north of the river until we came out on ^{higher} ~~west~~ open, smoother plains country with less timber. Keeping a generally westward course we passed several ranches with windmills & finally made a dry camp on high rolling plains - Camp came about 20 miles & suppose the distance to Rock Springs to be about 35. Barometer read 2150 at camp in morning, 2300 on the first edge of the more open country & 2450 at our night's camp - corrected readings from reservoir as base.

After leaving the bushes & rough gulches the juniper becomes scarcer, scrub oaks take the predominance & with lots of *Rhus trilobata* scattered in. Mosquitoes are common in protected basins & on open south slopes but entirely absent from most of the country. *Juglans nigra* is common along the water courses which are all dry at present.

Struck *Amphispiza*, *Pooecetes gramineus* & *Sturnella* on open country - also *Pipilo trivirgatus* -

Saw Thompson hills where we stopped for lunch - about half our distance - & now where we camped. set traps & caught one. Saw *Perognathus* holes all along

The air is clean & fresh & delicious though the sun shines hot during the day. The expanse of country; good grass, & high sky are delightful & the sweet, tinkling song of Cassin sparrow & occasional buffle of a meadowlark perfect the charm of the plains.

Rain is badly needed - the grass is abundant but dry - The water courses are all dry & we had to pay for water at ranches for our stock. Water is raised from deep wells by windmills, horse or steam pumps & the supply is scarcely enough at present for the stock on the ranches. Fields of corn are raised at most of the ranches but it has dried up without earing & is being cut for fodder.

July 11.

Caught a *Thomomys* +
Donald got a young *Onychomys longipes*.
Made up specimens + started at 8:30
Found the same kind of country - high
open ridges + basins, with scattered
brush + small trees of scrub oak,
Rhus trilobata - *alata*? + on wet slopes
or basins a few mesquite, *Sesuvium tripartitum*,
Zizyphus? + one or two *Sesuvium secundiflorum*
bushes. ♀

Starting with the barometer at 2400 feet
it read 2400 on the next high
ridge and 2450 at lunch camp
at Robinson Ranch, 16 miles east
of Rock Springs, 2450 at camp 11 mi. E. of R.S.

Cactus, mainly a small, plains prairie
engelmianus, *ylvesii*, + a bunched up
form of *stricta* are abundant. Grass is
good but dry.

Thomomys hills are common on the
willow wet soils. One Jack rabbit (*L. texianus*)
was seen + numerous cottontails -
a few fox + coyote tracks. Shot a bullock oriole
near his nest + a *Sturnella hoopsii* -
+ brown dipper. Lots of *Cassius sp.*
Camped at rain pools 11 mi. E. of Rock Springs.

to Rock Springs

July 12 - Caught only *Peromyscus* - a little
one & a little *Perognathus* - Came on to
Rock Springs - 11 miles over good road
on top of ridge & same kind of country,
the town is on the highest part of the
highest ridge and is 2493 feet by
Geol. Survey. Aneroid was reading
200 feet too high.

After getting mail & supplies we went
out to the ranch of a Mr. Wade, 7 miles
south of town & 100 feet lower & camped.

The country around Rock Springs is the
same high - half open plains that we
have found all along on top of the plateau
a little more brushy & grown up in the
region about town & out a few miles,
the country is said to be getting more
brushy the longer settled.

The three species of scrubby oaks are
by far the dominant shrubs. but there
is considerably *Rhus trilobata*, & *alata*?,
some juniper where oaks appear, a little
mosquito in low basins & on open south
slopes, also a little *Berberis trifoliata*,
Aceria ?, *Eisenhardtia arborescens*,
Amorpha fruticosa, *Diospyros mexicana*,

out to Wade's Ranch

Opuntia engelmannii? (the small one), *Cereus paucispinus*,
Yucca stricta?, *Y. rupicola*.

At Wade's Ranch there is lots of
Pinus cembroides? among the juniper.
It is on the edge of the buckedown & very
rough & rocky, brushy with scrub oaks
& lots of juniper. To the south the country
becomes still rougher toward the Mueen

Rock Springs is in almost pure
Upper Sonoran zone - the trace of Lower
Sonoran is mainly on hot slopes, rocky
exposures, or protected basins.

Mr. Wade tells me that in winter very
little snow falls & usually there is
little freezing weather. He comes
from Abasco where he says it is
much colder, snowing lying on the
ground for part of the winter.

July 13 - Sunday. The boys stayed at camp writing & getting a few jays & setting traps. I went with Mr. Wade over on the Hackberry Creek about 7 miles east of the ranch - Saw some rough country but did not get anything.

July 14 - Left Cary to get jays & took Donald on a trip down the Hackberry horseback - Got 3 *Spermophilus buckleyi* & saw 3 more, perfectly typed, got a *Sciurus harrisi*. Came back to camp about 2 P.M. Made up skins & set traps.

The Hackberry is apparently about 700 or 800 feet below camp, a big creek from a spring a mile above where we struck it. The valley widens out a little below with patches of rich soil & beautiful woods of chestnut oak, pecan, & elm hung with big old grapevines. Some of the patches have been cleared & raise good corn & vegetables. Poor little ranches are scattered along the valley & the hills & rocky slopes are eaten bare by goats & loose stock.

Rock Springs

July 15 - Returned to Rock Springs where we remained most of the P.M. to get some repairs on the wagon & get supplies, then moved out about 2 miles on the fur road & camped. While in town I photographed part of the horns in the Buckhorn Saloon where they have about 350 sets on the wall, all of white tail & apparently all texianus. Many of them large and heavy but not ^{usually} ^{very} long. There are also very small sets that suggest coveys but they are all slender & seem to come from young or dwarfed deer. I

I then went over to Dr. Robinson's place where he has 6 tame deer, a 3 year old buck & a 2 year old doe & 4 yearlings, & photographed them. The buck is small with rather small horns half grown & in the velvet. All are in the red coat & all have very long tails, black on top. They are poor & not doing well because they do not get proper food.

We then went to a store & saw a pair of mounted Massena quail & Mr. Githens tells us they are fairly common here.

Set barometer at 2570 feet at Rock Springs - camped only 25 feet lower.

Lepus arizonae = 410 x 64 x 98, ♀

July 16 - Came about 22 miles on the

Sovera road over high bald open, bushy plains the same as around Rock Springs. and varying from 2400 to 2600 feet in altitude. At lunch camp the aneroid read 2500, the same as at Rock Springs, & at night camp 2600. About 10 miles west of Rock Springs we crossed a wide basin probably 100 feet lower than town & full of Lower Sonoran plants - lots of mesquite with nearly ripe beans, *Acacia*, 3 species, *Berberis trifoliata*, ~~*Cercocarpus pallida*~~, *Zizyphus obtusifolia*, *Dalea condalia spathulata*, *Rhus microphylla*, *Ephedra nevadensis*?, *Opuntia leptocaulis*. Many upper Sonoran species were scattered with them but the basin was mainly lower Sonoran.

As we came upon the high ridge again most of these plants disappeared & scrub oaks, *Rhus trilobata*, *Rhus viscosa*, *Rhus copallina lanceolata*, *Nolina texiana*, *Yucca repens*, *Yucca stricta*?, & here & there scattered *Quercus* & *Sophora secundiflora*, *Diospiros texianus*, & an occasional Mesquite.

As we get farther back into the plains mesquite & other lower Sonoran

species become more common on account of broader base level, & at our night camp the mixture is complete. Mesquites & most of the previously mentioned Lower Sonoran forms being common, also *Lippia* & a fig *Yucca*.

The country becomes noticeably more arid with more cactus & *Yuccas* & *Nolina*.

Of Upper Sonoran birds there are *Sturnella*, *Aimophila* *cassini*, *Aptalacoa* *cyarotis*, *Chardilus* *v. harrisi*,

Of Lower Sonoran species - *Amphispiza* *bilineata*, *Milvulus*, *Calispepla* *queenosa*,

Saw a few *Spermophilus* *m. peroidius* & numbers of their burrows. Got a young one that a bull snake had caught & killed & just begun to swallow. Saw a few hills of *Thomomys* & plenty of *Lepus* *texasensis*, & some cottontails - *arizonae*?

A few ⁽²⁾ ranches near the road & others seen at a distance, all with windmills. Had to pay 2¹/₂¢ each for watering the horses at any ranch.

Cool & pleasant.

to 20 miles of Juwo

July 17 - Got only *Peromyscus* + *Perognathus paradoxus* + a little *Perognathus* in traps. Made up skins + started at 8:30.

Continued on the Sochora road N.W. about 4 miles to within 2 miles of Whets Ranch, then turned to the south down a draw for about 9 miles to another ranch about 300 feet lower, then turned west up a side draw + camped ~~at~~ ^{at} lunch at 2400 feet. The bottom of these draws + hot side slopes are mainly Lower Sochoran, with abundance of mesquite, *Cordia*, *Zizyphus*, *Yucca macrocarpa*, + *Dasylerian*, the first of the ~~two~~ ^{two} last, seen in abundance.

Continuing after noon to the S.W. we climbed to the top of the plain again at 2400 feet where all is Upper Sochoran, then descended another draw to a ranch in the Whitehead pasture where we got water for the night + then after turning up another draw we camped 2 miles beyond the ranch at 2400 feet. We are 20 miles from Juwo. Came about 27 miles today.

At camp we are in mainly Lower Sochoran with abundance of mesquite + other zone bushes, but on the ridges above us is mainly scrub oak + juniper.

To Beaver Lake + Juno.

The country gradually becomes more arid and we keep finding more plants of the arid region. The big yucca & Dasylirion have become common & one slope was covered with Agave laelanguilla.

July 18 - Aneroid read 2400 at camp, at 8 am. Crossed a ridge at 2500 and then descended a long series of "draws" to Beaver Lake, the head of Devil's River, 3 miles above Juno. Down ~~to~~ 2100 at Juno & the lake. The top of the ridge is upper Sonoran but down in the draws we are in pure lower Sonoran with its full set of plants & with such new species as Hesperaloe, Fouquieria, Licium, ~~Quercus~~ ^{Quercus} ~~oblongifolia~~ ^{angustifolia}, ~~Psoralea~~ ^{Psoralea} ~~angustifolia~~ ^{angustifolia?}. At Beaver Lake we strike five large pines & live oak trees. Our camp is under a live oak that spreads 100 feet & measures 18 feet in diameter at 4 feet from the ground. It is not over 40 feet high to forks 8 feet up but has huge horizontal branches. A family of *Megascops* live in it & a *Melanerpes auripennis* is feeding young in a branch.

Beaver Lake is nearly an old slough +
in the river bed - probably fed + kept
up by a spring, but now it is low +
with no water flowing out. It is full
of fish + I shot a sucker for supper
+ another for breakfast. Saw lots of
bass, sunfish, + a gar.

Lots of birds around the water.
Shot a *Sciurus notabilis* + an *Evotopus*
virens + saw *Actitis*, + *Eupidomax*.

The sides of the valley rise in steep
terraces of lime stone, half barren,
to a height of 200 or 300 feet above
the valley, flat topped ridges full
of side cuts + gulches + long
draws. Stock is too abundant
for the grass + both valley + hill
sides are eaten bare. The country
besides being arid is suffering from
drouth. A few showers seem to
have struck this locality not long
ago, as the mesquite has come
out in flowers again while the
old pods are ripe + falling.

July 19

To Devils River

Loaded up & moved camp, stopping at juco to get a horse sled, then down the valley 13 miles to where the Devils River rises from a hundred big springs & camped on its bank under big pican trees.

The river is fed by springs, or creeks, that come out of the banks from under the layers of limestone. and in the first half mile becomes a rapid stream some 50 feet wide & one to 3 feet deep according to slope. The water is cool & transparent but contains considerably more mineral (carbonate of lime probably) but is more than do the wells of the country.

It is a beautiful stream, & full of fish, bass, sunfish, suckers, catfish etc. A forest of magnificent old pican trees shades the river & the narrow flats on each side, & making a royal camping place - a cool, shady oasis in the mosquito desert of the valley, as rare as the bubbling and gurgling of cool spring water.

Aneroid at juco 1900 - at camp 17. outtop of side mesa 2100.

To Comstock

July 24. - Started for Comstock, following down the river 7 miles & crossing it 3 or 4 times. The valley grows narrower where we left river & has wonderfully beautiful spots all along, under groves of big pears or "mass" loaded old live oaks. Passed 2 ranches - The river grows larger & springs keep coming out. Rocky cliffs appear in places & some are full of cavities & caves. At Comstock Mr. McDonald showed me a piece of pure saltpeter from one of the caves.

Leaving Devil's River ^{at 1650 feet} we followed up a long draw to top of mesa at 1850 feet, then up & down over open country to Comstock at 1800. & camped on mesa at 1850 a mile east of town.

The road is good & most of the way perfect - hard & smooth as a floor.

The top of the mesa is largely upper Sonoran with *Dasycteria*, *Uoliva* as its dominant plants. No mesquite except in gulches.

Here we strike Cassin sparrow again which was not found in the Devil River valley. The top of the mesa is cool & breezy & not very stony. Good grass where the sheep have not been.

To Rio Grande

July 25. - Packed specimens & sent off 10 packages by rail - Got Hollister & started south to the Rio Grande & camped near the river 8 miles south of Constock. Set the aneroid at Constock by station level - ~~770~~ ¹⁵⁵⁰ at camp it read ~~450~~ ¹¹⁴⁰ about 50 feet above the river - ~~probably~~ ^{probably} ~~reading too~~ high. The country drops away gradually without cliffs or gulches until near the river where there are interrupted cliffs of limestone full of big caves & hollows.

We soon have *Dasylicium* & *Nolina* & near the river valley strike ^{mesquite again,} *Sarcocolla*, *Acacia constricta* and in the rocky gulches near the river lots of *Pistachia mexicana* & *Nicotiana glauca* along the sandy shore.

The sandy flats along the river are covered with big mesquites, *hackberry* and ^{mesquite} brush, in places open, stony woods & again a jungle of thorns. The soil is rich & well. A crop of ripe mesquite beans lies on the ground under the trees & the trees are again loaded with nearly full grown pods.

The river is high & flows into all the side gulches where we can get fairly good water that does not stink much.

July 24-27 - Hunted & Trapped along
the river & out on mesa. got
S. grammurus couchi ~~down~~ on rocky
cliff below camp & for the first time
in my life heard the little ground dove
coo.

Found large caves near camp
that used to be indian strong "holes"
apparently - as there are abundant signs
of camp in & around them. Numerous
old grinding holes are worn deep into
the rocks along the ~~edges~~ of the cliff &
flint chips & old arrow heads are scattered
over the ground. Most of the arrow
heads are of the crude Cowwache type
but Suerber found one of the ^{the} slender
little points of the Pueblo? type.
suggesting that both tribes have
been here & may have had trouble
over possession of the caves.
The mortar holes were probably for
grinding mesquite beans as there
are no acorns or nuts.

back to Comstock

July 28 - Returned to Comstock & divided our party, sending Donald to Devils River, putting Cary & Hallister with the outfit while I take to the R.R.

July 29, Worked on cleaning up various odds & ends that had been neglected, writing most of the day.

July 30 - Finished packing specimens & getting outfit in shape for the trip. Took 5:20 P.M. train to Pecos High Bridge & stopped at section house.

July 31, Went down in the Canyon above the High Bridge & found an old beaver trapper & fisher, John Sewell Sewell, who has been a keen observer & is unusually intelligent. He is now catching big catfish of several species for the market & has them picketed out all along the river. For other people the fish will not bite but he seems to have a knowledge of their habits that gives him a corner on the market. He told me many interesting things of their habits.

Pecos High Bridge

He is also apparently a good trapper + hunter + especially a beaver trapper. Will get skulls + things for us next winter. Moreover he is a good cook + knows how to pick out a choice fish for a steak + to make delicious coffee. I enjoyed dinner + supper with him as well as a a long, interesting talk about the country, fish + animals.

Went up the river a couple of miles to the beaver lake in a side canyon + got some photos of it + of the beaver cuttings but the water is so high the dam is out of sight. The lake is a natural reservoir filled from the river at high water. It runs back half a mile up the deep canyon + is overhung by willows, a very pretty place. + While there I planned a scheme for starting a beaver ranch + asked Eawel why it would not be a great thing. He says the beaver are too solitary + ferocious in disposition, that only one family will usually live in a pond + these fight or kill any others.

Painted Caves

Says this is also the opinion of his last trapping companion who is a more experienced beaver trapper than he. & Says they will always kill one in a trap or a side or crippled one, just as I know the musk rats do.

Aug. 1 - Went down to the Painted Caves, or to the biggest cave of the many painted caves along the Rio Grande. It is half a mile below the mouth of the Pecos & we reached it by a hard 7 mile tramp from the High Bridge. Found it an interesting place full of Indian signs & traces of coon, civet, cat, & fox. It is in a cliff some 300 feet high overlooking the Rio Grande. Is about 100 feet wide & deep & half as high. After our hard tramp in the scorching heat its coolness was grateful as well as the little spring of good water in its back corner. Its floor is covered 10 or 15 feet deep with old otter scales - the walls are staked

from the big fires where the soto was
roasted. This soto mass is also full
of fish bones, & mesquite beams that
helped support the Indians who have
scattered thin flint chips - arrow &
spear points among the rubbish &
painted the back walls of the caves
in crude pictographs. Everything
points to the Comanche as the inhabitant
rather than any higher grade of Indian,
both pictographs & arrow heads are
crude & I could find no trace of pottery.
A thorough examination of the debris
would probably throw much light
on the history of the cave & its former
inhabitants.

The little side flats along both
Pecos & Rio Grande are interesting in
this position, rich soil & possibilities
for agriculture. There is rarely any
frost in these canyons & with
plenty of water on the rich bottom
land soil the most tropical plants
& fruits could be raised. Water could
easily be pumped onto it & in places
carried over it with ditches.

To Langtry

Returned from Painted Cores in time to catch the evening train for Langtry. Found Gordon Donald on the train on his way to Paisano.

Stopped at Langtry with W.H. Dodd.

Aug. 2. A still, scorching hot day.

Was tired, foot sore + half sick from the heat + yesterday's tramp so did not get out to the marsh.

Aug. 3. - Sunday. Another hot day but not unpleasant as a good breeze is blowing. Wrote, packed specimens + tonight take train for Valentine.

Aug. 4. - Reached Valentine before daylight and was fortunate in meeting one of our last year's friends, Joe Suttler who helped me get located in a pleasant place in the edge of town.

There has been lots of rain in the valley + grass is green + flowers numerous. Even the downy woods + shrubs are full of wild flowers.

Saw Otis Finley + arranged to go out to his ranch later. Spent most of the day writing. Cool + pleasant
altitude 4424 feet.

Valentines

Aug 5-9 - Gordon Donald arrived from Paisano Aug. 4 + started him to trapping in the valley about Valentines for Spermophiles, Perognathus, Peromyscus, Dipodomys etc -

There have been good rains since July 2. The valley is unusually green with abundant grass + bright with spring flowers. The tanks are full of water the soil mellow, + things are growing as in summer. The weather is cool + lovely.

Valentines is near the middle of a big open valley about 30 miles wide, apparently surrounded by mountains, the Davis Mts. on the east + north, and low escarpment ridges of lava rock on the west + S.W. There are gaps in the mts. to the south + west + the prairie meets the sky to the S.E. along the R.R. The valley seems like a big grassy prairie with tall grasses here + there + low bushes scattered in places. The drainage is north toward Van Horn. Altitude 4424.

The whole valley seems to be mixed upper + lower Sonoran zones. Most of the ground is given up to grass but

There are scattered & much dwarfed *Prosopis juliflora*, *Acacia constricta*, *Zizyphus*, *Condalia*, *Rhus microphylla*, *Opuntia engelmannii*, & even one or two dwarfed *Larrea tridentata*, *Microrhynchus* & *Hieracium canescens* are the commonest shrubs, the former forming thickets here & there. *Yucca stricta* grows in thick patches or scattered plants & often 10 to 15 feet high, a few *Y. macrocarpa* are seen.

The breeding birds are *Sturnella hepatica*, *Pooecetes gramineus*, *Chondestes*, *Corvus cryptoleucus*, *Speotyto* & in town barn swallows & English sparrows. The first *Partrama* arrived Aug. 8 & 9, & *Calamospiza* Aug. 9.

We can find no *Honoump* or *Onychomys* in the valley, but *Dipodomys spectabilis* are fairly common. Extensive prairie dog towns cover much of the valley. *Spermophilus opimus* are common & badgers have dig holes all over the prairie. *Lepus texianus* are common & also *Lepus arizonae*.

I shot one diamond rattlesnake near the town & found several longhorned horn toads

Valentine to Finlup Ranch.

Aug 9. Mr. C. O. Finlup came in to town & I went out to his ranch 15 miles east of Valentine in the foot hills of the Davis Mts. at west base of Livemore. Aneroid set at 4425 in Valentine road 5425 at the ranch. The ranch house is in a picturesque place ^{at} among rocks with the valley opening out below ^{the} the Mts. standing up high & rugged to the east. The ridges run to the west & have long slopes to the S.W. or N.E., giving a great mixture of zones. In places a stony S.W. slope is covered with *Fouquieria*, mesquite, *Zizyphus*, *Yucca stricta*, & *macrocarpa* & *Opuntia engelmanni*, while the opposite slope is covered with live oaks, junipers, & *Asinus*. In other words, a trace of Lower Sonoran is carried up by slope exposure 1000 or 1500 feet above Valentine, ~~but~~ ^{well into} the upper Sonoran zone. While the upper Sonoran seems to go to near the top of the Mts. on this side.

Aug. 10 - Went with Mr. Finley & his men
& a pack of 6 or 7 horses up into
swath of the canyon & caught one
Moeyon. Set traps in the peach
orchard for *Cratogeomys*.

Mr. Finley has about a dozen peach
trees near the water tank & they are now
so loaded with fruit that some are
breaking down with delicious ripe peaches.
They bear about once in 3 years Mr. Finley
says, the frost killing the flowers on
intermining years. I can not hear
of apples being raised here, but see
no reason why they would not do
splendidly, especially higher up in
the canyon where the cedar-junipers
grow. Probably frost would kill the
flowers in the bottom of gulches but
on side benches 50 to 100 feet above
the main floor of the canyon they
ought to do well, especially on
the cool slopes. It may be too
dry for them to bear every year
but probably apples to supply western
Texas could be raised in these mts.
in favorable seasons, & apples
of the best quality.

Aug. 11 - Rained all night + half the day,
cold + raw - Staid in house most
of day writing + working out some plants.
Took a tramp up in canyon in P.M.

Aug. 12 - Got up before daylight + went with
3 men + about 15 hounds for a hunt -
Caught one Urocyon + nearly caught
another, then lost half the dogs on
a coyote trail - did some good
running over rough country +
got back at 10:30 for breakfast.

Saw lots of jack rabbits + cottontails.
+ heard a blue quail -

Aug. 13 - Took a horse + started for
Mt. Livermore - Went 3 miles east to
the canyon leaded back to base of Mtn.
+ followed up canyon to base of steep
slope + left horse at 7000 feet.
Climbed the canyon side to north of peak
+ came out on top of main ridge at 8000
by aneroid, but probably 8500, then climbed
over a rocky crest + followed up an easy
gully to ~~the~~ main peak. A horse could
be ridden to 100 feet below peak over easy
slopes

The last 100 feet is a steep & rocky & the peak is a narrow ridge of lava 100 yards long & 1 to 10 yards wide on top with sheer walls all around except on the north end. At the highest point the old indian mound was merely a heap of stones over a grave for which about 3000 beautiful arrowheads, dills etc. have been taken. I found a few broken pieces that show something of the skillful work in stone chipping.

The view from the peak is great though the air was a littleazy. The Guadalupe & Doornants Mts. show distinctly, and also the Diablo & Carbonates & Sierra Blanca, Santiago Peak & range & a dim outline of the Osage or Rosillos beyond. Practically all the Mts. of Texas & some in Mexico would show from this peak in a clear day. A long line of the plains beyond the Pecos show.

The timber reaches only to the foothills & is heaviest in the higher part of the Mts & in the gulches. It is mainly oaks & nut pine & juniper but yellow pine grows in all the upper canyons & white pine on the high north slopes.

A lot of *Populus tremuloides* grows at the north base of the big domes NW. of the peak.

The zones are greatly mixed, Upper Sonoran covering a great part of the Mts. to the top of the main ridges on warm slopes. Transition reaches from bottom of canyons on cold slopes to the top where it is mixed with a trace of Canadian.

Some good grooves of Pinus strobiformis stand near the heads of the high gulches on the coldest slopes, the best grove of it seeming to be in the canyon just east of the peak.

Bears are still common - Thomomys goes to top of highest peak, & seems to fill Transition zone. Lepus halpinus also goes to the summit & comes to lower edge of Pinus ponderosa. Saw few deer signs. & no signs of Microtus or Sigmodon.

Returned to ranch & went with John Finley to his ranch about 4 miles down the valley in the open country. Crossed about 2 miles of prairie dog town where nearly all of the prairie dogs have been poisoned & the grass is coming back.

Had nothing to eat from a 6 o'clock breakfast to a 7 o'clock supper, but enjoyed the days trip immensely.

Valentines to El Paso

Aug. 14 - Returned to Valentines with John Finley, crossing the prairie by a new road. The valley is so green & covered with flowers that it is a veritable prairie instead of an arid plain. Found beautiful cactus in bloom & saw a few new fall birds.

Aug. 15 - Wrote on reports all day.

Aug. 16-17 - Remained at Valentines, writing & sending a few specimens.

Aug. 18 - The train for El Paso was late & did not come till 5 A.M. so I was able to see the country all the way. For about 20 miles we followed down the wide valley to the north, then up a long, gradual rise past the base of the Eagle Mts. & up to Sierra Blanca, then down to the Rio Grande Valley at Ft. Hancock. This whole trip is in Lower Sonoran zone with only a mixture of Upper Sonoran at Sierra Blanca & on the N slopes of hills. Larrea & mesquite & Kochelium are common all the way except

for patches where grass holds the ground or a cold slope excludes them.

Since the rains the grass has grown thick & high. The Fouquierias & other plants have put on full leaves & most plants have come out in flower, so the desert looks like a spring prairie. A little *Chrysothamnus* like bush covers the slopes near the Rio Grande, from Sierra Blanca to El Paso, with a golden robe, and numerous kinds of brilliant desert flowers spot the ground with color. The *Larrea* has gone to seed.

Many species of cactus are in flower. I never saw the desert vegetation at such a stage of perfection, each plant rounded out, full, symmetrical, and perfect, standing alone and uncrowded.

The ranches along the Rio Grande Valley look unusually flourishing, & the boys bring baskets of peaches, pears, grapes, & apples to the train.

The sereno ~~bean~~ bean (*P. pubescens*) is the common bush of the valley & every bush is loaded with beans.

El Paso

Aug. 19 - Got my camera repaired,
check cashed, & did some writing.

Aug. 20 Returned to Van Horn,
& located at the section house
with Mr. King.

Aug. 20-25

Hunted sheep & panther in the
hills north of Van Horn & trapped some
on the open valley.

The whole big valley is pure Lower
Sonoran, while the low, rounded Mts.
to the north are upper Sonoran on their
north slopes & over the tops, with
Agave lechuguilla & *Fouquieria* on rocky
south slopes nearly to the tops.

They are cut off from the south end of
the Diablo Mts. The eastern ridge of
this group is known as Baker Mts.

The Eagle Mts. lie 20 or 30 miles to the
west with the Bass Mts. as a little
range between here & the S.P. R.R.

Aug. 25 - Went to Toyah & met Cary &
Hallister with outfit. Camped near Toyah
to pack specimens, write reports & rearrange outfit.

Aug. 27 - Started Cary & Donald
for Press & Monabans to work
about 3 weeks, mainly in the
sand hill region about Monabans.

Toyah

Aug. 28 - Left Toyah at 9:30 A.M. &
headed for the high peak at the South
end of the Guadalupe Mts. some 80 mi.
to the N.W. Traveled all day over
open Larrea plains, slightly up grade
 Aneroid reading 3000 at Toyah but 3800
at our camp at the Cottonwoods at
night, 35 miles from Toyah.

The country is arid Lower Sonoran
with a great deal of gypsum in the soil
& rocks & water. At present there is a
splendid growth of grass & vegetation
over the country, lots of flowers
that should have bloomed in the spring
but waited for rain, there is lots of
good rain water in the tanks & pools
all along except in the gypsum hills
where we camped. Here we found only
a spring creek standing on beds of
gypsum & saturated with it so as
to be almost undrinkable.

While most of the country passed over
is pure lower Sonoran we strike a
strong upper Sonoran element at our
night's camp on the east slope
of the low range of hills, with

Junipers forming quite an extensive forest, but with *Larrea* covering the hot slopes of the ridges. This is really an arm of the Piñon Hills lying some 15 miles to the west of us & running from the Guadalupe nearly to the Davis Mts. as a low range of rough, rounded hills, scattered over with juniper & nut pine part of the way & apparently carrying Upper Sonoran zone south to the low gap where the R.R. goes through at San Martin & Kent.

We passed one ranch 9 miles from Toyah & another 18 miles but saw no other places of human habitation. There are lots of cattle all along but for the gypsum & bad water this would be an excellent stock country.

Cottonwoods to Halls Ranch

Aug. 29. Started early and traveled toward Guadalupe Peak all day & camped at 6 P.M. at or near a part of the Hall ranch some 15 miles east of the peak. Came 30 miles, passed but one ranch - the Smith ranch 5 miles back from where we camped & at the edge of the gypsum country. Here we struck sandstone, clean soil, & good rain water in rock tanks. We passed several windmills on the way but the water was saturated with gypsum & scarcely drinkable. Saw dozens of big caves that go back into the gypsum rock from big sink holes in the ground. Went into several of them for long distances but found only wet walls & muddy bottoms & water standing in pot holes. Heavy rains flood them & prevent any thing from living in them.

The sandstone country gives beautiful grassy valleys with flat topped buttes & ridges between. Gramma & other fine grasses are knee high & matted out.

Aneroid read 3800 at Cottonwoods last night, 4400 on one of the ridges we crossed + 4000 at our night's camp. We followed along the east slope of the Piñon hills + were crossing ridges + valleys all the way, sometimes down into pure Lower Sonoran + again up on the ridges or on cold slopes in pure Upper Sonoran in forests of junipers, big *Opuntia arborescens*, *Microthamus* + *Halimolobos*. In the valleys + on south slopes *Ferrea*, Mesquite, *Acacia constricta*, *Zizyphus*, + other Lower Sonoran species predominate.

Birds are numerous + mainly migrants such as *Caloceryx*, *Bartonia*, numerous sparrows + warblers + such breeding species + robbers, *Harporhynchus rufiviridis*, + *Pooecetes cassini* + *Amphispiza bilineata*.

Prairie dogs are numerous in some of the valleys, coyote + badger + *Lynx* tracks are common. *Cratogeomys* hills are seen all along in willow soil but no *Thomomys*. *Neotoma*

To Pine Canyon in Guadalupe Mts.

houses are ~~common~~ under the juniper trees + among rocks. + 2 that Hallister caught prove to be albicula.
Lepus arizonae + texianus are ~~common~~.
We strained our eyes all day for antelope without seeing any. It is a beautiful country for them.

Aug. 30 - Traveled nearly due west all day + camped at 6 P.M. in a canyon at south end of Guadalupe Mts. - A ranchman called it Pine Canyon. Came about 25 miles all up hill. Averaged in morning road 4000, at night camp 5850. In middle of P.M. about 6 miles before camping we climbed a high bench to a level of 5000 feet + left every trace of Lower Sonoran, struck oaks, junipers, Agave sphaerata, Arbutus, a big Nolina, + full set of upper Sonoran things.
Camped at edge of yellow pines by fine spring.
Saw one antelope, 2 blood-tailed deer, + after camping located 3 mountain sheep on sides of canyon.

Guadalupe Mts.

Aug. 31 - Started earlier up where I saw the sheep last night & in an hour he had killed a Ram & ewe out of a bunch of 5. I followed up the canyon to where it turns to the east & climbed the ridge to the west onto two peaks back & higher than the first, but found there was another gulch to cross between my highest peak & the one to the west that I supposed to be Guadalupe peak. The aneroid read 8500 on the peak I climbed & the next peak was apparently 1000 feet higher - but another peak to the north & one to the east appear just as high. The big point of rock at the corner of the canyon is not quite so high as when I was.

The mts. are all limestone except a few strata of sandstone & shale at the base, they are steep & rough but easily climbed. The north slopes are covered with yellow & white pine. The same set of trees & shrubs occur here as on the Dog Canyon

sids, oaks, maple, ironwood, *Pinus ponderosa*, *Strobiliformis*, *edulis*, *Pseudotsuga*, *Juniperus pachyphloea* & *occidentalis*, *Amelanchier*, *Cercocarpus betulifolia*, & "microphylla", *Arctostaphylos*, *Philadelphus*, *Agave* *obovata* to top, *Yucca* - etc.

Birds were the same as last year with no additional species.

Eutamias canipes are common & tame. But I didn't shoot any for fear of seeing bigger game. Saw several *S. grammurus* & saw *Thomomys* hills to top of peak. Hollister caught an *Amospermophilus intrepidus* near camp. *Urocyon* *eremicus* - Saw a few bear signs. Saw one large black-tail buck near crest of range at 8000 feet.

The stomachs of the two mountain sheep were full of leaves & seeds mainly of the little leaved *Cercocarpus*, also lots of seeds & leaves of wild onion, *Philadelphus* leaves & seeds, & a few traces of grass stems & leaves.

To Salt Valley

Sept. 1. A cold, rainy morning. We tried to keep warm & dry for awhile & then packed up & started in the rain & most froze till we crossed the divide of the ridge & got down into the canyon leading out to the big Salt Valley below. The divide was somewhat lower than our camp in the Pine Canyon, probably about 5500 feet. Found a fairly good road down the steep west slope to base of escarpment, probably 500 feet down, & struck the full set of lower sonoran plants at the base. Continued west down a gentle slope of the valley about 10 miles from the ridge & camped a few miles back from the salt flat opposite the north end of the Diablo Mts. on the west & not quite so far north as Guadalupe Peak. Came about 20 miles. Aneroid 4000 at camp in valley.

The limestone of the escarpment of the ridge running south of the Guadalupe is alternated with sandstone & shales & black streaks that appear to be coal or carboniferous shale.

Salt Valley

Sept. 2. Followed the bottom of valley about 30 miles north between the Guadalupe + Cornudas Mts. ^{or camped} about 10 miles south of the lower end of Dog Canyon out in middle of valley. The valley is 10 to 30 miles wide, flat bottomed with gently sloping sides. The lowest part is opposite Guadalupe peak + is occupied by numerous long, shallow lakes of salt + alkaline water. At present since the unusually heavy rains these lakes nearly fill the playas + water has been running in the connecting channels between.

The whole bottom part of the valley is approximately level + the soil is usually full of alkali, lime, or gypsum or salt.

Only the south + north ends of the Guadalupe range have been visible, as the front range of rough limestone ridges cuts out the middle part.

In passing the Cornudas we had a good view of them as they appear, a sharp little group of craters + peaks of lava.

The Sacramento appears as a blue ridge far to the north. A low range of rocky hills, apparently limestone, lies just west of camp.

At the north end of the playas are miles of large sand dunes, often 50 feet high, clean & white as snow in beautifully curved drifts.

We passed 3 or 4 old abandoned ranch cabins where stock water & 4 inhabited ranches of a poor kind. There is lots of stock in the valley but the water is so bad that few people can live here. There is abundance of grass but mostly of poor quality. The valley is not a good stock & ranch country.

Barometer read 3875 at morning camp about 100 feet above the bottom of valley. 3800 at noon camp at sand dunes & the same at night camp.

The whole valley is Lower Sonoran with the usual set of plants along the side slopes, - Larrea, Mesquite, *Aescia constricta*, *Fouquieria*, *Zizyphus*, *Koeberlinia*, *Lycium*, *Baccharis*, *Yucca microcarpa*, *Y. stricta*.

The alkali & salt flats here a distinct set of plants of which *Atriplex canescens*, *Holodiscus*, *Suaeda*, ^{*Sarcobolus*} ~~*Holodiscus*~~ & other salt grasses are conspicuous. Also a new bush that seems like a large *Forstria angustifolia* ^{also an immense *Sigilovicia*} only it is rot.

Coyotes howled around our camp last night & tracks were ~~common~~ along the road. I got 2 skulls at a ranch. Panthers are said to come down out of the mts. & kill colts. A few *Lobos* are said to trouble the stock. *Dipodomys spectabilis* hills are ~~common~~ all along on upland. & tracks & holes of small *Dipodomys* or *Perodipus* are ~~common~~. *Cratogeomys* are all over the valley except in the playas. One cottontail & one jack were seen.

Valley west of Guadalupe.

Sept. 3. Started early & followed the valley north about 30 miles & camped where the valley narrows up to 2 miles wide. Most of the way it is 10 or 15 miles wide between the bases of hills. Found one ranch 10 miles after starting & one at 20 miles farther was where we camped.

Good grass all the way but no water. A shower crossed the valley ahead of us at noon & we soon met streams of water coming down the road.

The valley is lower & warmer with the same old set of plants, but a few junipers & Holms appear near our night's camp when the aneroid read 4700 against 3800 in morning. We are near the edge.

Some Antelope sign was seen at intervals along 20 mile strip of uninhabited valley & one antelope was seen.

A *Spermophilus mexicanus* was seen & the usual *Dipodomys* mounds, *Cratogeomys* hills, & here & there colonies of *Cynomys*.

Woods Tanks.

Sept. 4, Hallister caught + Onyebouys + Surber shot a coyote that came almost into camp. After a cold, rainy night we did not try to get an early start, but gave the skins + our beds a chance to dry off.

Started at 9 + in about 3 miles up the valley left the bulk of Lower Sonoran plants at about 4800. A trace went up south slopes to 5000. We met *Juniperus occidentalis* and *Agave aplinata* at 4750 feet with abundance of *Molina*, *Saxifraga*, + the low yucca over the open grassy slopes.

At Woods Tanks, the next ranch 7 miles up, scarce a trace of Lower Sonoran remains.

We follow an easy grade up over grassy slopes between long ridges to the N.E. all day in plain view of the whole length of the Guadalupe Mts. to the south + the timber covered slope of the south end of the Sacramento Mts. to the north. The line of mts. is broken by this low part of the range but scattered timber of *Juniperus*, nut pine + oak scrub reaches in strips + patches across the gap.

Sacramento Mts. - to Weed.

Sept. 5. Got a late start but waded about 25 miles ^{mostly} all up hill to Weed. Moved up & up along grassy valleys & ravines and now and then over a ridge & up another ravine. At one place we went down 300 feet & then up again till we crossed the highest ridge near Weed at 7500 feet. Weed is 7200.

Started at 6050 feet. Struck *Pinus ponderosa* at 6500 feet & it became the dominant tree. *Pseudotsuga* & a lobe leaved oak began at 7000, the former on cold slopes only.

Beautiful country, with a good mixture of timber & grassy park like intervals. Scrub oak covers some of the slopes. Road muddy from yesterday's heavy rain.

Heard the first *Eutamias* & saw *Sciurus* cuttings a few miles south of Weed.

We are now fairly into the timber of the Sacramento Mts. & have covered the lowest part of the range between them & the Guadalupe Mts. The lowest gap when we crossed the range was 6625, & it is safe to say that there is a practically continuous level of 7000 feet between the two ranges with continuous *Juniper* & nut pine timber & almost continuous yellow pine

Sacramento Mts.

Sept. 6 - From our camp a mile below Weed we followed down the valley ^{of the Ahwahie Creek} 5 or 6 miles - then over the ridges and down Hunter Hill to the Peraseo which we struck 20 miles below Cloudercraft. Then followed up James Canyon to within 12 miles of Cloudercraft + camped. Came about 20 miles.

Ameroid read 7000 at our morning camp, about 7300 at top of Hunter Hill + 6600 at Peraseo Creek, + 7500 at camp again. Down the valley of the Ahwahie Creek + in the Peraseo Valley we were in mainly ^{Upper} ~~Lower~~ Sonoran zone with junipers + nut pines but the rest of the time in yellow pine forest with douglas spruce on cold slopes. A few oak trees grow along the edge of the pines + scrub oak covers some of the sidehills.

The valleys have rounded bottoms of rich yellow soil + are extensively cultivated. Good crops of corn, wheat, oats, cane, + vegetables are raised besides fruit. Apples, peaches, + pears are raised in abundance + of excellent quality. Sunflowers + other weeds grow in great luxuriance + often form beautiful fields of golden yellow.

Flowers are in their full spring prime but mixed with all the fall species, such as Goldenrods, asters, sunflowers, roses are still in flower.

A Mr. Nations, who gets his mail at Wud, tells me that the last elk he knows of being killed here were killed in 1893 & 4. He thinks they never ranged south into the Guadalupe. but an old hunter told him of killing one there that he thought had been run out of the Sacramento with dogs.

Prairie dogs are abundant in the parks up to 7000 feet. *Eutamias canipes* is common in the timber, & a small yellow-billed species is abundant along the fences beside the fields. Pine Squirrels are numerous & cutting cones. *Crotogeomys* hills are common along the valley bottoms up to about 7000 feet & *Thomomys* are numerous in the timber & upper parks. A *Lepus texianus* was seen at about 6800 feet.

Birds are numerous, both resident & migrating species. Hummers are still here though the nights are almost frosty.

To Clouderoft

Sept. 7. Followed up an easy grade with good road + camped about a mile + half east of Clouderoft.

Averaged at camp 7500, at night camp 8700.

At about 5 miles east of Clouderoft we struck the edge of Canadian zone on N. E. slopes at 8000 feet, where we left *P. ponderosa* + struck *Abies*, *Picea*, *Populus tremuloides*, *Ases*, + a new set of smaller plants. No more transition appears except on hot slopes.

Picea is the most abundant Canadian zone tree. The Canadian forest is dense + beautiful, untouched + perfect.

The yellow pine is being cut below + a spur of the railroad runs out 2 miles east of the pumping station.

We did not find the little *Eutamias* above about 8000 feet, not in Canadian zone. At a ranch I found a pair of large deer elk horns + photographed them as I could not buy them. Bought a head of a white tail + black tail + saw another head of a larger white tail with horns in the velvet.

Cloudecroft

Sept. 8 - Remained at camp till noon, writing & packing specimens & making up skins. Holliester caught a lot of *Peromyscus* & besides *Peromyscus* my traps had 3 *Microtus mordax* - 1 sp. & a *Sorex*. The night was almost cold enough for frost & the bright sunshine hardly dried the dew & warmed the air in all the day.

Went up to Cloudecroft & got supplies & started for Ft. Stanton. Crossed a high ridge to the north & down into Silver Springs Canyon & camped about 4 miles from Cloudecroft at 8700 feet.

Aneroid read 8700 at both camps, 9150 at Cloudecroft & 9300 on top of ridge. A hard shower & hail caught us just as we found a good place to camp in an old cabin.

Every gulch & valley & every turn of the road seems to show a more beautiful view of the forest which is one of the finest mountain forests east of the Sierra.

On the ridge we had a grand view of the white Mts to the north.

Silver Springs Canyon

Sept. 9. In spite of a cold, damp night outside we were comfortable in the old log cabin. The horses snorted a good deal from the side hill back of us & in the morning a big fresh panther track showed in the mud along the gulch in front of the cabin.

Remained at camp till noon, as we had much work to do & the road was wet & slippery. Then followed down Silver Spr. Canyon 3 miles & turned back to the N.W. of a little side canyon & camped below the summit in beautiful, untouched fir forest on edge of Indian reservation at 8550 feet.

The country grows even more beautiful. The reservation is ideal for wild, free life, beautiful grassy parks & deep forest. The grass is knee high & untouched & lots of springs & fine streams run along the valleys. We passed one fine ranch on Silver Springs Cr. just at edge of reservation but saw no other habitations.

Set over 100 traps near camp in evening & just at dusk heard turkeys fly up on ridge 40 rods back of camp. I hurried over & found about a dozen,

apparently all old ones, going to roost in top of yellow pines 75 or 80 feet from the ground. It was too dark to see my rifle sight except against the sky, but picking out the largest turkey I could see & holding the sight against the sky & then swinging sideways till hidden by the big black bird, I brought the old fellow to the ground with a heavy thud. He was a fine old gobbler & had his crop full of mainly wild oats, orches, and beside the oats a lot of snails, a few insects, seeds & buds of various plants. Mr. Carroll tells me that later in the season he has killed them with crops full of acorns.

The turkey was not fat but the meat fried in steaks was the most delicious I ever tasted.

The others flew to neighbouring trees or remained where they were & in the morning woke us before sunrise calling & with two or three gobblers before they flew down.

To Agency

Sept. 10. Crossed the summit a mile above camp & rode down to the agency & back - reaching camp again at 4 P.M. Broke camp at once & started on road for Elk Springs but found it was too far for the team to go before dark so let the boys camp about 6 miles down Silver Springs Cr. & went on to fork of Elk & back up Elk valley to Sawmill at Elk Springs, some 6 miles beyond where they camped, & staid over night with Carroll (the lieutenant) & Capt. Demont, the sheep man.

From our camp to agency is about 12 miles, ^{to Elk Springs about 10 miles.} Aneroid at camp 8500, on summit 8700, at agency 7000, at fork of Elk & Silver Springs about 7800, at the sawmill 8000.

Canadian zones on both sides of range reaches down to about 8000 on N.E. slopes, or lower if slopes are steep, but transition reaches over top of summit at 8700 on S.W. slopes & down to 7000 & nearly 7000 feet, & to below 7000 on N.E. at agency. Upper Sonoran with full set of

plants - juniper, nut pines, live oaks, sunflowers, atriplex, etc. - comes up to agency in bottom of valley & to 200 or 300 feet above on steep, rock, hot slopes.

We saw no trace of Upper Sonoran on east slope of range. Spruce come down to saw mill on N.E. slope but the valley is full of yellow pine. & lots of fields of roots are raised & some small corn. Still it is grassy there sometimes in June & July.

As near as I can tell over half of the reservation lies in Transition zone, about one third in Canadian, & only a little in Upper Sonoran. Mr. Carroll tells me that most of the Indians are in the valleys of the Elk & Tularosa, the greater number in the Tularosa above & below the agency. This is the warmest part of the reservation with a big, well watered valley & in reach of nut pines. but the best grazing country is on the east slope of the mts.

In going from the summit down to the agency I followed a gently sloping, round bottomed valley between pine covered

ridges most of the way. Fine springs come out at intervals all along & nearer to the agency larger ones that join & make a large creek. Most of the way the bottom of the valley is park like & beautifully spread between the trees, but nearer the agency it becomes marshy in places or is covered with fields of grain or weeds. oat fields are scattered along nearly to the head of the valley & lower down are fields of wheat & corn. The indian houses in the upper part of the valley are not occupied at present. Several of these empty little log houses with windows only in the gables were seen & usually some empty tipis were near by. Lower down the indians were living mainly in the tipis outside of their houses.

The agency is quite a town with stores & P.O. & numerous large buildings for schools, barns & various purposes.

To ~~Redondo~~ Sawmill & up Elk Valley.

Sept. 11. After spending the night with the agent & sheep man Brewster I returned a few miles along the road till I met the boys with the outfit. We stopped at several indian camps & got a few photographs, skins & baskets, then followed up the valley & over the divide & camped at 7500 feet about 5 miles east of the agency. At the summit the aneroid read 8600.

Kept in yellow pine transition zone all the way except on N.E. slopes going down the gulch on west slope of mt. The same beautiful, open, grassy forest with park like valleys that have never lost the round form of bottom left by the glaciers.

Shot 7 *Spermophilus 13lineatus* of a little dark, undescribed form that is common in the park from the mill up to about 8300 feet. Saw a colony of *Cynomys ludovicianus* at about 8300 feet.

Carried a keg of water & made a dry camp as there is no water on the way between the sawmill & Agency.

To Agency & Ruidoso.

Sept. 12 - Followed down the road about 5 miles & came to Agency instead of Ruidoso & found we had taken the wrong road. Turned back over another summit of 7900 & down a long valley to the east to the store at Ruidoso at 7000 feet, - 14 miles from Agency at north edge of reservation. Then turned up Ruidoso Creek about 6 miles & camped at 7300 feet. Have been in yellow pine transition zone all day except at the Agency & Ruidoso where nut pine & juniper cover the warm slopes. The country is all open woods & big grassy parks but without water till we struck Ruidoso Creek half a mile beyond the store. This is a large creek coming out of the White Mts. & watering the valley below. It has clear water - evidently contains fish as a kingfisher flew from its bank.

Up Sierra Blanca

Sept. 13. From our camp at 7200 feet on Ruidoso Creek we rode up the creek about 4 miles & left it at 9200 feet, turning up the ridge to our right & riding west of the way up to timberline on the S. E. side of the mountain, where we left our horses at 9900 feet. From this point we followed the east ridge of the mountain to the peak over grassy slopes, the aneroid reading 12400 at the summit. Another trail turns from the higher up the creek over the ridge to the left & goes up an easier grade along the south ridge of the mountain where they usually ride to the peak.

The only true timberline on the mountain is on the N. E. slope where the dwarfed Piceas reach to 12200 feet & in one place to 12400. The other slopes are too dry for spruce timber and most of the area above 10000 feet is covered with fine bunch grass. A Canadian zone timberline at 10000 feet where *Pseudotsuga*, *Pinus strobiformis*? & *Populus tremuloides* + *Quercus* (lobed leaf), reach their limit forms the limit of the main forest. In places these reach up to 11000 feet, but most of the slopes are treeless above 10000.

On some slopes the open grass country runs down to bottom of gulches at 9500. to where the creeks begin.

On the south & east sides of the mountain these grassy slopes form a large & important area of fine grazing land with the best of grass. In the timber lower down are many grassy parks & much tall grass but mainly of wild oats, or a kind of wild chess, that is an annual or biennial & would not bear grazing to any extent.

The N.E. side of the peak is cut out in a deep old glacial cirque that has changed but little since the ice left it. The bottoms of the valleys are still rounded & have where streams run & have cut a sharp gulch between the side lines of the old ice trough. These lines are distinct down to 7000 feet at Ruidoso at least. Several large creeks flow, or rather tumble, down the canyons from the mountain & make fertile farming valleys on all sides. The Ruidoso canyon, up which we followed, is steep narrow with high slopes of the

A flock of nearly full grown *Muscina quail*
were found on open ridges at 9500 feet.

of the hottest & coldest exposures -
consequently zones are badly mixed in the
bottom & strongly marked on the sides,
but taking the more open slopes as an
average for this side of the mountain
the zones are about as follows: -

Upper Sonoran: - At Huindoso in bottom
of valleys up to 7000 feet & on steep hot
slopes up to about 7200 feet - marked
by *Pinus edulis*, *Juniperus monosperma*, *Juniperus*
pachyphloea, *Quercus* v. (scrubby live oak),
Atriplex canescens, *Equisetum*, *Habenaria*
annua, etc.

Transition: Covers the greater part of the Mts.,
reaching over the summit from near
Mesaduro to near Huindoso, and from
about 7000 feet up the White Mts. to about 8000
on N.E. slopes & 10000 on S.W. slopes and
is marked by *Pinus ponderosa*, *Populus*
angustifolia, *Sambucus*, *Spirea*,
Ribes mesocarpum, *Rhus glabra*?, *Cornus*
asperifolia?, *Gliditachia monosperma*?, & in part
by *Pseudotsuga*, *Quercus* (lobed leaf),
Acer grandidentata, *Praxinus* etc. -
see note book for others.

Canadian zone: - Covers the cold slopes from about 8000 feet to 11000, but only the upper part of the peak on the warm slope, from about 10000 feet to the top. It is marked by *Abies*, *Picea*, *Populus tremuloides*, *Pinus strobiformis*, + in part by *Pseudotsuga*, *Acer grandidentatum*, *Acer* (strawberry leaf), *Quercus* (lobed leaf),

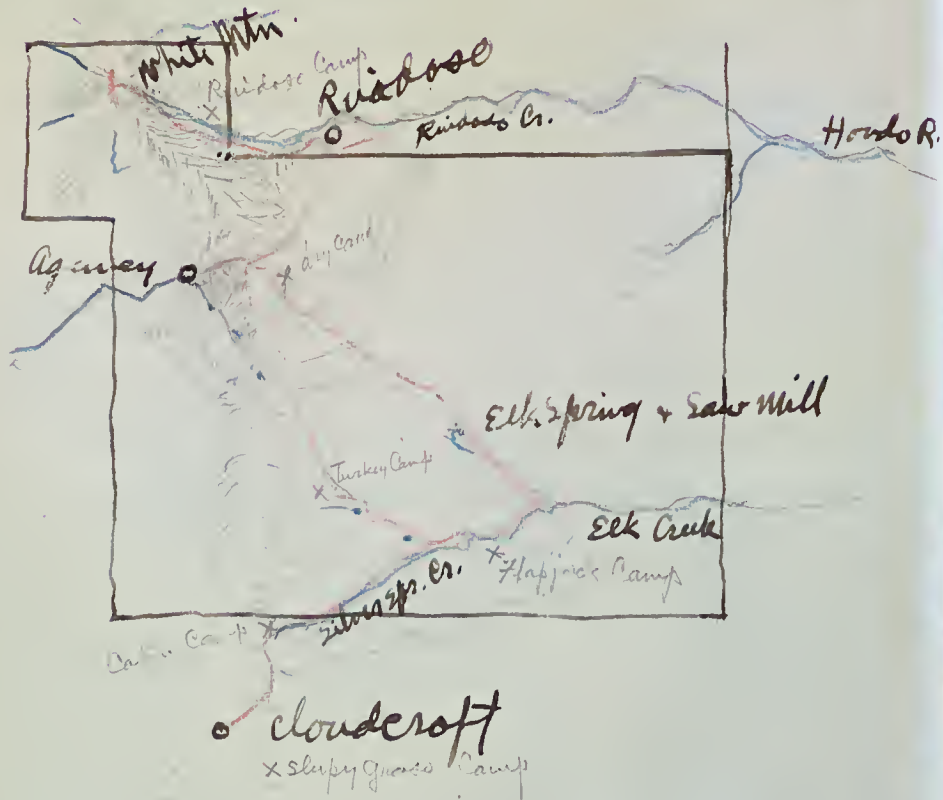
Hudsonian zone: - Covers the N.E. slope of the peak from about 11000 to 12000 feet to the summit + is characterized by dwarf *Picea*, + numerous small plants - see note book.

Also by *Nucifraga columbiana*, *Myiadestes townsendi*, *Anthus* -

Mammals: of the White Mts.

Mr. Winfield says the last elk were killed here about 10 years ago but some were reported seen farther south only 4 years ago. Other later reports of elk seen or tracks of elk he does not credit. Blacktail + white tail deer are both common. There are no sheep but Mr. Winfield says there are sheep in the San Andreas Mts. 100 miles west of here.

N.



Mescalero Indian Res.
 Our route ———
 Water ———

S.

Sciurus ~~are common~~, also
 Eutamias ^{upto 12000 feet} campestris, ~~Microtus~~ ^{Microtus} fallax? was caught
 at our camp at 7500 feet + nests seen in
 rocks above 10000 feet. Microtus swarm
 over the sides of the mountain to the very
 top, probably 2 or 3 species. Marsh hawks
 were hunting them over the high slopes.
 Peromyscus are numerous in the timber
 & apparently up near the peak. Thomomys
 are numerous all over the mts. to the very top
 of Sierra Blanca. 2 or 3 species of bats
 were collected at our camp. Black + brown
 bear are common - we saw fresh tracks
 + a skin of one killed a few days ago by
 Mr. Winfield, who says a few silver-tips
 also live around the mountain. Lynx
 are common - Mr. Moor at Ruidoso says
 the Indians catch a few beavers in the
 creek every winter.

Sierra Blanca

Sept. 14 - Sunday. Remained at camp doing neglected writings + to have time for much needed baths.

Sept. 15 - Started early + came down to Ruidoso for supplies + the horns we had left there, then continued down the valley of the Ruidoso Creek all day, camping in edge of lower Sonoran at 6000 feet. Came about 30 miles - about 25 below Ruidoso.

Transition zone comes down on cold slopes with *Pinus ponderosa* to 6700 feet, some 10 miles below the store. Junipers (both kinds) + nut pine come down on cold slopes to 6000, on warm slopes to about 6500.

Mesquite, *Rhus microphylla* + a few lower Sonoran plants come up to 6000 on sheltered hot slopes, but the bottom of the valley can hardly be called lower Sonoran yet.

The valley is settled all along with little Mexican rancheries, with little patches of cultivated ground + good crops + lots of fruit. The houses are primitive little adobes but the settlements seem real.

There is lots of water in the creek + irrigation ^{ditches}.

Hondo

Sept. 16 - passed the place called Hondo, at junction of Guadalupe Creek & Hondo R. about a mile below camp & then followed down the valley past Picacho & about 5 miles below, where we turned out of the river valley over the hills & struck across plains toward Roswell. Camped about 22 miles west of Roswell at old rain pool on open plains.

Averoid at Camp 6000 & the same at Hondo, at Picacho 5600, where we left river 5400, top of mesa 5900, camp on plains 5000.

The Hondo valley is mainly Lower Sonoran. The plains are grassy Upper Sonoran with *Nolina* & *Mimosa biuncifera* in places but covered mainly with short grass. We found 2 water pools toward night but for long distances there is no water & the grass is untouched.

To Roswell

Sept 17 - Got an early start & reached Roswell at 1 P.M. - 23 miles. Down hill nearly all the way & good road over grassy plains.

Aneroid at camp 5000, at Roswell 4000

No gone plants on open country, but mesquites in gulches & rough slopes. Apparently mainly Lower Sonoran as all of the upper Sonoran species have vanished.

For 6 or 8 miles out from Roswell the ground is covered with weeds & *Gutierrezia*, all of the grass having been killed out by over grazing. A flock of about 2000 sheep at the water 6 miles out from town have made a dusty desert of the region.

About 15 miles out we saw 3 big wolves some 600 yards off on the prairie. They looked like antelope as they stood looking at us. but at a rifle shot ran with great speed over the prairie.

In P.M. packed & shipped specimens at Roswell & camped 3 miles north of town at Mr. Urton's

Roswell

Sept. 18. Camped over the day at Mr. Urton's ranch to get our outfit separated & reports & letters written.

Sept. 21, Left Roswell at 9:15 A.M.

Larrea & *Mesquite* are abundant on the rough slopes & valley sides near the Pecos River but no *Larrea* seen after getting well out of the narrow valley into open plains & *Mesquite* becomes scarce & dwarfed & mainly confined to gulch slopes. Beyond Campbell (station & section house) at edge of open plain little *Mesquite* was seen & *skull oak* is abundant as far as the sand dunes reach - about Portalis.

The country is mainly brown with tall *Andropogon* which is the conspicuous grass as far as the sandhills reach, or to about Portalis & in some south slopes beyond. As we come higher up on the plain the characteristic short grass carpet is almost the only vegetation.

It is hard to say where Upper & Lower Sonoran zones meet as they are mixed from Portalis to Roswell, but Lower Sonoran is mainly on warm slopes.

To Awarillo to Goodnight

The Staked plains are dry & brown & in many places closely grazed. Apparently there has been considerable frost. *Liatris* & *Gutierrezia* are about the only flowers.

Five antelope were seen between Herford & Dawn & a bunch of 9 between Canyon & Awarillo. A Coyote was watching the herd at Around Postek's & at other places across the plains good crops of sorghum & cuppe-corn are raised for fuel. The gulch bottoms especially are farmed near Herford & Canyon & yield good crops. Reached Awarillo at sundown.

Sept 22. The train was late so I started for Goodnight at 8 am. instead of 5:20. Found smooth, short-grass plains with ponds of water here & there till east of Aund - where the country breaks down rapidly with gulches, & beds of canyons near Goodnight & mesquite in the gulches. *Andropogon* also becomes the conspicuous grass on south slopes and scissortail flycatchers are common in Mr. Goodnight's yard. A sharp escarpment appears to the S.W. with two bushes

Goodnight

Mr. Goodnight drove out with me among his elk & buffalo & talked about them as I took a few photographs.

He has 9 elk of which I saw 8 in the yard near the barn where they have lately been brought to be gentled. The one buck has lost his horns, one being broken off in roping him & the other sawed off to balance, & with his horns seems to have lost his masculine energy. They are quite gentle & some will allow themselves to be caught, but the buck is rather shy. They are fine condition & spirits, plump & with full tawny coats. Have been running in a big pasture until a few days ago.

The buffaloes, of which Mr. Goodnight has about 50 full bloods & 70 crosses are enclosed in several large pastures by a 7 or 8 foot, 13 barbed wire fence. They have abundance of good grass and are fat and healthy & happy. The herd of full bloods were mostly lying down enjoying the warming sun after a cold night, but as we drove among them they got up & passed at any distance

discovered. The largest old bull was taken at 15 feet & showed no signs of fear or anger, although Mr. Goodnight said they would kill you in short order if on foot near them. The hair is ragged & not long yet but they are beauties without any evidence of their confinement. The 3 largest old bulls were not in this herd as they prefer to keep off in a rough gulch by themselves.

The different grades keep mainly apart, but one two thirds buffalo cow & a calf by a full blood bull (the calf only 2 days old) were at one corner of this herd. (see photo). This cow was of a yellow brindled color with very long hair & mainly of the buffalo form. Her horns were slender & much curved in. The calf was yellowish brown, a little lighter than a full blood buffalo calf but otherwise not different. In another pasture with the polled angus cattle we found the quarter bloods, which differed little from the black hornless herd except in a slight difference of form

+ in much larger size than the cattle of the same age. They were black, mainly hornless, but the yearlings were as large as two year olds of the cattle + Mr. Goodnight says the full grown steer weigh 1500 lbs. I photographed 3 of them ^{yearlings} at a distance of 15 feet. They are perfectly gentle but keep out by themselves away from the cattle.

Mr. Goodnight breeds only buffalo bulls to domestic cows + increases his full blood herd as fast as possible. Has just sold 15 to the Yellowstone Park where Buffalo Jones is trying to bring up the depleted herd. He says the full bloods are very hardy + that he loses none save ~~now~~ by injury in handling. Says the crossed heifers breed freely but the bulls do not, so he makes sture of them.

Says three quarters of the calves are bulls.

Returned in time to catch the 11:20 train to Dalhart + then got a 5:20 P.M. train for Logan, N. Mex. where I arrived after dark.

Photographs Taken 1902 v. 12

8 [Jefferson + vicinity 8, June 10-13.
mainly of woods, cypress + pines
At Marshall 4 - 1 of *Pinus mitis*, 2 of
general ridge woods, oaks, hickory, pine
etc. - June 16. + of wild morning glory.
At Zimpron - June 17, 4, 1 of woods
of *Pinus mitis* + 2 of Sweet gum, oak,
+ ironwood + hickory woods.
At Joaquin 4, 2 of end of log of *P. taeda*,
13 inches across inside of bark, 22 years old,
grown in old field, + 2 of forest
of *P. taeda* on old cotton rows - June 18.

21. Huntington town - from station - a typical Texas
lumber town, June 21,
22. Same of other side of town.
23. Prairie + pine woods on border near Houston, June 23
- 24-26 - Same, as 23, *Rudbeckia* + Core flowers
- 27-30 Max on live oaks + pines near Houston, June 25
- 31-45 - *Taxodium* along Guadalupe R. at
Antes Point, Texas, June 26.
- 46 + 47 - Live oaks with *Tillandsia recurvata* + nest
of *Chordeiles* in the moss, June 27.
- 48 + 49, distant hills over cotton fields, same place

50-58, At camp near Ingram, Kerr Co.,
Cypress along Guadalupe R., hills on south
side of river, drift where *Medusa* & *Mura*
tectorum live along river bottoms.
July 27-3.

Logan N. M.

Sept. 23. Logan is half a mile north of
the Canadian river. I have taken a long
tramp down by the river and got a
good idea of the country. The river
runs through a narrow gulch or
in places almost a canyon 135 feet
deep where the R.R. bridge crosses it.
with rocky (sandstone) walls in places.
The country is rough & full of gulches
& side canyons for some distance
back on both sides & abrupt escarpments
show in the distance to the north.
The N.E. slopes of the valley are covered
with junipers, the S.W. slopes with
mesquite, *Mimosa* (like *bicolor*), *Rhus*
microphylla, & *aromatica*, *Aster*, *Opuntia*
arborescens & *leptocaulis*. *Yucca glauca*,
gutturifera & grasses cover the whole
country. In other words the sheltered
S.W. slopes are strongly Lower Sonoran
while the cold slopes are purely
Upper Sonoran as are the grassy
plains higher up. Thus a mixture
of zonal species are carried up the
river valley with apparently as
much Lower Sonoran as at Zascosa.

In a mile walk I counted 47
Callipepla, saw one Pipilo megalonyx +
one Oreospiza chlorura, 2 Falco mexicanus,
Salpinctes + bobtailed young near nest,
Zenaidura Otocoris + longspurs.
Mr. Bisse tells me he finds Geococcyx here.

On the way across to Santa Rosa
^{divide,} we follow up + down creek valleys,
across mesas from one valley to another
and through many rough gulches, crossing
the highest divide a little east of Santa Rosa.
The country is all mesas, flat topped
ridges, + the valleys cut between through
the horizontal layers of sandstone.
but some of the valleys are extensive
+ some of the mesa tops are wide prairie.
What surprised me most was to find considerable
low mesquite scattered on south slopes +
in gulches + valleys all the way across
from the Canadian to the Pecos. In many
places the mesquite covers a south slope =
facing a juniper + nut pine covered north
slope just across the gulch. Almost
perfect continuity of upper + lower Sonoran zones
could be traced across. The country is picturesque
+ very interesting.

Santa Rosa

Sept. 24, The country around Santa Rosa
is even rougher than any on the way
across from Logan, the sandstone ridges
at the sides of the Pecos valley being cut
through by numerous narrow canyons.
An open valley spreads out just below
Santa Rosa but the ridges on both
sides are covered with juniper + nut pine.
Low mesquite bushes + several other lower
Sonoran plants grow in the valley on all
the warm slopes.

Big alkaline meadows occupy the bottom
of the valley and numerous creeks of alkaline
water flow from fine looking springs,
several of which are of enormous size +
great depth + beauty. The finest of these
great holes in the earth is said to be
150 feet deep of the most transparent
water. Another is called the bottomless
pool, as no bottom has ever been found.
All of the pools + springs are swarming
with small fish. As a little boy
explained the water is so full of alkalis
they can't grow any larger.

See note book for plants, birds + mammals.

