A 1911 NATURALISTS JOURNEY TO WESTERN NEBRASKA: THE JOURNAL OF FRANK H. SHOEMAKER

by

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At the turn of the century, the study of Nebraska's natural history was still in its infancy. At this time, several professors associated with the University of Nebraska were studying the natural features of the state. Charles Bessey, one of the most outstanding, was perhaps best known for his reforestation efforts in the Sandhills.[1] In the 1890s Lawrence Bruner joined the school faculty to teach economic entomology. Two of his students, Robert Wolcott and Myron Swenk, helped with insect research and all three men also had an intense interest in birds.[2] These men contributed significantly but much remained to be discovered. The opportunity still existed for an amateur naturalist to search the wilds for new discoveries. Frank H. Shoemaker was such a person.

Frank Shoemaker became a Nebraskan in April of 1897 when he moved to Omaha from his native state of Iowa. Although he was employed in non-scientific fields, first as a stenographer for the Western Union Telegraph Company and then as a private secretary to the general auditor of the Union Pacific, Shoemaker was an avid outdoorsman and a "Sunday" naturalist.[3] For "when the Lord's Day comes around, I pull out for the woods and fields, and breathe the pure air while I learn about the different creatures which the Lord has pastured out on this handsome sphere."[4] This intense interest included observing migratory and nesting birds, insect collecting and preparation of scientific specimens, studying the blooming of wildflowers, and other general observations in natural areas in the vicinity of Omaha.

Luckily for Shoemaker, Omaha lay nestled between the wooded bluffs of the Missouri River and native prairie covered some of the hills and the land beyond. Within the city limits were parks and vacant lots for a "Sunday naturalist" to occupy himself in his studies. Two of Shoemaker's favorites were Cut-off Lake north of Omaha and the Childs' Point region in northeast Sarpy County near Bellevue.[5]

On his Sunday forays Shoemaker would record observations that were later printed on a press in the basement of his residence and put together in a personal journal. These notes tell of the contents of bird nests found, the date when a bird arrived in spring, when a particular woodland flower bloomed, and of other notable events which occurred during the outdoor excursions.[6]

One of the most scientific endeavors of this man was his study of Tiger Beetles. In 1909 Shoemaker had fifteen boxes of these insects that he had collected throughout the West and properly identified and labeled.[7]

The reporter who examined this collection excitedly proclaimed that there was "such an array of them. There are bronze bugs and gold bugs and copper-colored bugs. There are beetles creamy white and gray and silver; there are those of black, dull jet, and those of a satiny luster; there are those with opalescent lights and those of an ugly wicked brown; there are those which changed in the light from deep violet to vivid green; there are some of a dull, muddy, prosaic hue which, when seen through a magnifying glass, have markings and mottlings of rare loveliness." They were a "riot of color."[8] These specimens had been found in the Nebraska region as well as in Oregon, Florida, California, Washington, Arizona, Texas, Nevada, Wyoming, Utah, Idaho, and Louisiana. Shoemaker had collected them during free time available when traveling for the railroad.

Shoemaker shared his knowledge of Tiger Beetles with Dr. R.W. Wolcott of the Zoological Department at the University of Nebraska. He also communicated with other authorities on beetles at eastern universities as well as sending local species to the eminent specialist Dr. Walther Horn of Berlin.[9]

In 1910, the "Sunday naturalist" decided on a change in employment. The offices of the Southern Pacific, Union Pacific and allied railroads--the Harriman Lines as they were called--were being moved to New York. Having visited that city frequently, Shoemaker had no desire to take up residence there. Two other positions were available. One with the United States Biological Survey in Washington, D.C. and the other as a stenographer for the Oregon and Washington Railroad. Neither position looked attractive, and so Shoemaker looked elsewhere.[10]

He wrote to the University in Lincoln to inquire about possible opportunities with that institution. Dr. Wolcott of the College of Medicine was a long time friend and was helpful in securing a half-time position for Shoemaker with the Department of Zoology handling correspondence and records. The pay was fifty dollars per month for four hours work each day. Four additional hours daily during the week were spent attending zoology, entomology, botany, and other classes as an adult special student.[11]

Early in 1911, Wolcott and Shoemaker began planning an expedition to western Nebraska. Since both men were expert entomologists, insect collecting was to be an important part of this journey. However, since these biologists were interested in all natural features of the outdoors, they intended to keep notes on the flora and fauna as well.

Wolcott wrote that "generally stated, the object of the party was to become more familiar with [ecological] conditions in the western part of the state and collect exact data with reference to soil, climate and biological conditions in the different regions visited."[12]

Several months later, on June 11, this expedition left Lincoln for western Nebraska. With transportation provided by the Nebraska Conservation Commission, the members of the scientific party spent two and a half months in the field

collecting specimens and making records of the birds and plants observed. The several thousand specimens collected were to be identified in the laboratory during the winter and then placed in the botanical and zoological collections at the University. The practical value of this research and accumulation of data was to provide an analysis of the environment of the counties visited, especially in terms of the agricultural potential of the various areas.[13]

Shoemaker recorded the activities of this expedition primarily for his own interest and enjoyment. However, his unpublished travelogue also provides important comments on the natural conditions present in western Nebraska at the time. The annotated lists of butterflies and birds and other biological notes provide specific records of flora and fauna which enable scientists to compare the region today with 1911 conditions. Environmental changes can then be evaluated.

The first entry for Shoemaker's personal travelogue was made in Sioux County, the day after their departure.

Sioux County, June 17 to July 2, 1911

The main object of the University expedition of 1911 into the pine ridge and sandhill regions of Nebraska was a study of ecological conditions. It is hoped that a study of the life and the life conditions in the vicinity will afford a better understanding of various problems of distribution and the relation of the fauna and flora of one region to those of neighboring but very different regions.

Our party in Sioux County from June 17th to July 2nd consisted of the following persons:

Dr. Robt. H. Wolcott, zoologist, University of Nebraska - specializing on ecology, and collecting particularly beetles, butterflies, myriopods, reptiles, and mites.

Prof. Raymond J. Pool, botanist and photographer, University of Nebraska, and Prof. Cyrus V. Williams, botanist, Nebraska Wesleyan University - collecting botanical specimens and studying various plant problems.

R.A. Leussler, Omaha - in his trivial moments Assistant General Manager of the Omaha Street Railway Company, but seriously a lepidopterist, collecting both butterflies and moths.

R.W. Dawson, from Entomological Department, University of Nebraska - collecting several orders of insects.

Frank H. Shoemaker, special student in zoology, University of Nebraska - collecting beetles, spiders, butterflies, and grasses; photographer-in-general for the Zoological Department and for himself.

Tom Powell, Sioux County, cook and charioteer, with Bill and Sorrel and a large hard wagon.

Dr. Wolcott and I left Lincoln on the evening of June 16th, the rest of the party having preceded us one day. We

had a preposterous amount of baggage, little of it checkable, and had to make three trips apiece to the train to load or unload our possessions. Through oversight, a suit-case was checked which contained a quart of 95% alcohol and a quart of formaldehyde, and before the train left Lincoln Dr. Wolcott went to the baggage car to get it. But the baggage-smashers had had one smash, which was enough, and he returned with a sorry-looking suit-case, soaked and bedraggled and redolent of divers liquids - a pint of whiskey charged with quinine having joined with the other fluids in the wreck. These five pints of stuff had soaked everything in the suit-case, including all of our medical supplies--bandages, cold cream adhesive tapes, etc. And how the formaldehyde did advertise its presence! It is a most assertive liquid, and many were the tears shed by ourselves and most of the people in the car. We expected to be thrown out, but I think few of the passengers knew where the trouble came from. When the train got in motion the situation was somewhat improved by the draft, but whenever there was a stop the people wept. After forty miles or so had been traversed, a man came across the aisle and accosted the Doctor. "Beg pardon, but - isn't there some formalin leaking in your baggage? I'm an undertaker." This last doubtless offered in explanation of his ability to recognize and classify the odor. Dr. Wolcott assured him that there had been some leakage, and hoped it didn't bother the gentleman? Oh, no, no; no annoyance; only he thought he would call attention to it. The Doctor set forth enough of our woe to make it clear that the leakage was beyond control, and the sympathetic undertaker retired with tears in his eyes.

I had so much to interest me out of doors in the moonlight, after the rain had passed and the sky had cleared, that I did not care to sleep, and spent my time studying the country until we were well toward the western edge of the sandhill area. By this time the east was faintly illuminated, and I slept for an hour or so, taking up my observations again as we reached the rugged butte country near Crawford.

Crawford is prettily situated on rolling ground with picturesque buttes near by, the White River, a tributary of the Missouri, flowing between the town and the heights. This is a clear, rapid stream, of small volume except as compared with other streams of this region. There are trout to be found near Crawford, but the good fishing is further upstream.

We had only a short time to wait for the C.&N.W. train, and were soon on our way to Harrison, following the south side of the ridge and enjoying some really fine scenery, as this pine ridge country has some pleasing features, especially if one has fallen into the error of considering Nebraska wholly a prairie and sandhill state.

Arriving at Harrison, we found Profs. Pool and Williams, with Powell and his outfit, and soon had our provisions and baggage loaded into the wagon. We borrowed cots from the Fair Association, and extra blankets from Mr. Geo. Gerlach, who throughout the summer did everything in his power to be good to us, and who we all feel under obligations. Leussler and Dawson had started earlier for Monroe Canyon, to collect butterflies on the way.

For four miles north of Harrison (which is a small town, and which looks very small indeed from that distance), the region is one of rolling plains, with little to suggest canyons or pine ridges. But at that distance we passed over a high point, and the head of Monroe Canyon lay near us, its green pines and white buttes leading away to the north into Hat Creek Valley, and that in turn being visibly bounded miles and miles away by the nearer slope of the country leading up to the Black Hills, which themselves appeared as low clouds on the horizon. It was a magnificent view, the more effective on account of its sudden disclosure.

From this height the road descends into the canyon, which continues to lead downward until its mouth, over three miles from its beginnings, is about 600 feet lower. The sides of the canyon are covered sparingly with bull pines, which rarely form a dense growth in this region. Cedar is found occasionally, and juniper as well, the three constituting the entire coniferous growth. The region was in earlier years "lumbered" just enough that large pines are rare.

Descending the canyon, deciduous forms appear in increasing variety, until well down the canyon the growth of elm, cottonwood, hackberry, box elder, ash, dogwood, and cherry, might well be that of any stream of eastern Nebtaska, were it not for the interpolation of black birch, mountain maple, diamond willow and other mountain species, and the occasional pine which breaks away from its true habitat to join this company. There is considerable undergrowth, and the general character of the vegetation near Monroe Creek is in striking contrast to that of the slopes even a few yards above.

Our Sioux County home, kindly placed at our disposal by Mr. J.C. Pentzer, of Lincoln, was a two-story cottage, with two rooms on each floor. A stove, half a dozen chairs, an ax, a saw, cooking utensils, a sufficiency of tableware, and other articles, were either visible or soon became so, and we found ourselves well outfitted for our tarry with surprisingly little trouble. Mr. Pentzer's generosity was often a topic of conversation. Only a few steps from the house, topped by a many-branched birch, was a glorious spring, three feet in diameter and two feet deep, furnishing the best of water, with a temperature of about 50 degrees.

The house is on the west side of the Monroe Canyon road, which is the thoroughfare to Harrison for all the ranchers and cowboys of Hat Creek Valley and the neighboring canyons. Saturdays and Mondays are the heavy traffic days, and many teams and horsemen pass. Of course, nobody walks; that is an unknown means of locomotion. Throughout our stay we left the cottage unlocked, and the doors frequently wide open, for a full day at a time, while we departed on expeditions in various directions, and not one of our possessions was molested, though there were many handy things lying about, and notwithstanding the fact that the spring is a favorite stopping-place. Several large droves of cattle went by while we were there, as the country was so dry that change of pasture or enforced shipment to market was almost universal in that region. After one of these droves had passed, it was

surprising to note how many cattle-flies had availed themselves of stop-over privileges; for a day or two the road would be thickly inhabited by the pests.

The first afternoon was given over to "getting settled," as we called the hanging and piling up, shelving, tucking in, laying on and spreading out of our multifarious possessions. The upper part of the house was not convenient for our uses, and the rear room was by common consent held sacred to the operations of the cook. How we ever got all of our rubbish into one small room, even inconveniently, and left space for the table in the middle, will forever remain a mystery; for mark you, while one was in the room there was not sufficient space to see, or to think coherently, and when one went outside he had not the data visible for solution of the problem. But every member of the party proved a good fellow, and we passed sixteen happy days in this bedlam without any duels, and even with an unbelievable dearth of cuss-words.

We had arranged with Mr. and Mrs. Priddy, occupying the next ranch north, half a mile away, to furnish us bread, butter, and milk. Our other supplies came from Harrison. The bread was hard to beat - great white loaves, fatted out above the waistline and crowned with gold, and toothsome to a degree the memory of which brings tears to my mental eyes. And the butter was good. But except at rare intervals, the milk - the milk! Forsooth, why will otherwise righteous cows indulge in the yucca habit! Throughout the length and breadth of this long and broad region, the yucca flourishes; and wherever it flourishes, it flourishes only until a mild-eyed bossy can wrap her prehensile and rugose tongue about the flowers and transfer them to her preliminary stomach, where with weird alchemy she starts the process of their ultimate conversion into milk. The finished product bears an individuality which passeth understanding. Once yucca-wise, however, the victim, if he recover, is chastened and discreet; never again for him. And now comes the sad necessity of confessing that among our number there was one - I respect his family and withhold his name - who was so far departed from ways of rectitude that he "did not mind the slight flavor imparted by the yucca," and to him and a vacillating follower or two fell the pleasure of using our daily supply. This is a dispiriting paragraph, and I hurry on.

I did not find time to select a place on the canyon side for my bunk before dark, so I took my blanket and mosquito hood late in the evening and fared forth to lay me down and sleep. Crossing the road, I worried my way up the slope until I found a fairly level place, cleared away a few stones, and turned in. An interval of questionable duration passed, but I awakened suddenly and moved away from there. In the dark I shook the ants from my blanket and night-gown, plucked a few skirmishers from my calves and shoulderblades, and selected another site farther up. This was not so level, and as a precaution I brought a dead pine bough to use as a wedge under my low side, and soon composed myself for a rest - quite successfully this time, except that on two or three occasions I was awakened by skidding downward a few feet, which would necessitate readjustment of the wedge and rearrangement of my blanket before I could resume. On the whole, it was quite

satisfactory, and much better than sleeping in a bed. I allude, however, to that portion of the night following the ant episode, which I found annoying.

At break of day I was suddenly awakened by something landing on my feet, on my knees, stomach, breast, and bang in my face - a series of five nicely spaced leaps covering a grand total of five feet seven inches in two-fifths of a second. Naturally I sat up with some alacrity to ascertain just who had done such a thing, but the whole canyon side was serene. The pines spread their fingers overhead, the logs and rocks were quite impassive, and not a beast was visible excepting a lone pinion jay who was studying me, and he nearly fell off the perch in his amazement. My first impression was that it must have been a bob-cat, but careful reasoning led me to conclude that the volant intervals were too brief, and the impact rather light withal; so in the shattering of this hypothesis I was forced to conclude that it was a chipmunk. However, I woke up, and started another day, during which I selected a bed-room and moved my cot into it.

This was on top of the east ridge, 400 feet above the cottage and nearly a quarter of a mile away. Getting to it in the night involved a lot of hard climbing over rocks and slippery pine needles, but the glory of the sunrise compensated for all. I had an unobstructed view of the west ridge of Monroe Canyon, of the smaller canyon (Gerlach Canyon) east, or north-east, and of the picturesque Hat Creek Valley, with the Black Hills visible in the extreme distance. There was almost always a breeze on the ridge, and mosquitoes were rarely troublesome, though they were much in evidence in the valley most nights. I could stand a pretty stiff breeze and enjoy it, but when it became too lively I moved down the east slope a hundred feet to a selected place where it was quiet, and where I could still enjoy most of the scenery. Here I slept o' nights during the entire time we were in the canyon, and the memory of the beautiful mornings will long be mine. It became my habit to awaken at daybreak to see the sunrise, and my method was ideal. I would generally get it in the early stages, look it over and enjoy it thoroughly, then have another nap. Waking from this I would find an entirely new sky-plan, with unimaginable cloud massing and coloring; then another nap, and so on. The passage of time was entirely unconscious, and the beauty of the successive cloud effects beyond description. Each morning I spent an hour and a half or two hours in this way, with peaceful catnaps of ten or fifteen minutes between the intervals of delight over the surpassing wonders of the sky and the great valley which furnished so much room and atmosphere for the chargeful tints. Then I would arise and make a bee-line - a very devious bee-line down that canyon side! - for the breakfast table by way of the spring. On two mornings I did not awaken in time to see the sky-paintings, and these I still hold a distinct loss. Mine was the most ambitious roost of all. In vain did I descant in all the colors of the spectrum of the beauty of the sunrise over the valley; not one other would join me in my aerie. True, Dr. Wolcott did try it one sad night, but the wind blew, and the floods, while they did not come, made feint to do so, and the good Doctor was first blown away, and then

perturbed in spirit over the impending deluge, so much so that he plucked up his bed by the roots and decamped. It was a harrowing night.

Pool and Williams had them a small holding about half way up the canyonside, easy access from the cottage and sheltered from the winds. Leusler lodged nearer the cottage, and as his daily talk was burdened with tales of bob-cats and mountain lions, harpies and dragons, we conjectured that his proximity to "home" was based on prudential reasons. Dawson slumbered peacefully in the cottage night after night; no sentiment in him to eliminate the roof business and sleep out while he had a chance. Dr. Wolcott generally kept him company.

Early in the afternoon of June 18th our whole party boarded the large hard wagon and took the first of a series of drives to neighboring points of interest, going on this occasion to the mouth of Monroe Canyon and southeast from there to the "bad lands" of Prairie Dog Creek. The route was indirect, as we had to make long detours to cross intervening creeks, which all cut deep gulches in the unstable soil as soon as they emerge from the ridge. Powell knew the country well, and on this and all other trips he knew just how to reach our destination, which would have been a pretty problem without him.

All of the creeks running from the south ridge into Hat Creek Valley are fairly well timbered, and the appearance of these streams from a high point on the ridge is interesting; each stream for many miles can be traced by the growth of cottonwoods, elms, box elders, and other deciduous trees, with here and there a pine. Some of the streams start with a good volume of water from fine, cold springs, and manage to maintain a flow until they connect with the main streams far out in the valley. Others, however, starting bravely enough, yield to the thirsty land after they have traversed a mile or two, beyond which there is no water, although there is a well defined creek bed, for when heavy rains come, and in the spring when the snow in the canyons melt, there is a great amount of water to be carried away, and the whole region bears testimony to the frequent activity of these dry courses. The soil of Hat Creek Valley is of variable character, some of it being good land, as is evidenced by the farms scattered over it; but the entire region is underlaid by a shale or clay which can not withstand the action of water, and such peculiarly placed regions as are subject to a sudden ingress of large volumes of water are cut and slashed in every direction, losing their surface vegetation and soil and becoming expanses of "bad lands" - a surprisingly conservative name for this western country so given to lurid nomenclature. No reasonable amount of "conservation" will save these few peculiar regions, and no one who looks upon them will have any suggestions to offer as to their reclamation. Fortunately, the bad lands of Nebraska are of limited area, embracing comparatively few sections of land. They are limited to the western portion of the state, and more particularly the extreme northwestern part, where they are a negligible appendage of the vast tract of similar character which exists in South Dakota. Owing to their striking features they have been much exploited, both photographically and in a literary

way, until the impression has become widespread that the Nebraska bad lands are illimitable wastes, instead of the insignificant and scattered patches they really are.

The badlands regions are a wonderfully interesting field for study. After one look I tearfully buried every idea of conservation or reclamation, and joyfully devoted myself to viewing their wonders and using all the plates and films at hand. I made in all four trips to this region, and never came away with an unexposed film. The deep valleys, the wrinkled sides of the slopes, the grotesque erosion, the "confusion worse confounded" where two or more drainage systems converge to effect the destruction of a given region, and most striking of all, the laying bare by the water of innumerable fossil remains, furnished an endless field for observation and photography.

These fossil deposits are of great interest. One is impressed first by the great number of turtles, the shells of some specimens being five or six feet long, I am told, though we did not find any which exceeded three feet long. The problem of their geological history seems moderately simple so long as one finds only turtles, which are vastly predominant; but what happens to one's preliminary theory when he finds the head and bones of an antelope-like creature, and the fossil tooth of a carnivorous animal of fear-inspiring proportions? One can not imagine that these creatures were old friends of the marine turtles, and that they swam about in the same bay. So the geologists have concluded that there was a cataclysm or some such doings back in the uncanny pre-glacial days, and that these creatures of so many kinds were caught and swirled away together into this vast dumping ground. A peculiar change has taken place in the composition of these fossil remains, many having been metamorphosed into a calcite of quartz-like appearance, and it is a striking sight to come upon one of the large carapaces glistening in the sunlight as though set with a thousand gems. Most of these fossils are very loosely held together, and crumble under the action of the frequent floods, but fine jawbones can always be found with the teeth in such perfect condition that they must be a joy to the odontologist.

On the 22nd of June we drove to Sowbelly Canyon, seven miles east of Monroe, reaching it by driving up Monroe to the ridge and following this to the upper reaches of the desired canyon. Sowbelly Canyon is broader than any of the others, and is quite fertile - many snug little farms being tucked away between its walls. It is also one of the most beautiful of the canyons, its east wall particularly standing out against the sky with a magnificent series of pineclad buttes. Its handsome name dates back to the days of the Sioux wars, when a body of soldiers was corralled here by the Indians and held in a state of siege and trepidation, their sole rations being bacon. When this occurred, or how many soldiers were involved, or how long the siege lasted, or how it was raised, are trivial points which the inhabitants have not looked into, since they bear no relation to crops or cattle. A surprising ignorance of local history was encountered wherever we tried to get data of this character throughout the summer, and such

"facts" as we did get were so badly damaged that I have not used them.

After lunch we got busy trout-fishing, for it must be confessed that the trip to Sowbelly was undertaken for piscatorial reasons first, though we did our best to make it appear scientific. These trout were a sore disappointment to me. Far from being educated, they had not the slightest idea of the proper behavior to manifest when a Royal Coachman was deftly cast on the rippled surface and then drawn alluringly across the pool. They lay with heads up stream, lazily waving their tails and wagging their pectoral fins, and making eyes at each other. I got much personal gratification out of the handsome casts I made, but no rise, much less a strike, and in truth it must be said not even so much as an extra wiggle of a fin. So I remained carefully concealed and changed my fly for a Gray Hackle, which I cast with consummate grace and skill to the farthermost recess of the shady pool, and drew invitingly over the surface of the tiny ripples. The same rank unethical disregard was meted out to the Gray Hackle, the Profesor, the White Miller, the Grizzly King--why name the list, since they all met with the same glassy stare and the same lack of consideration? With withering scorn I plucked me a hale grasshopper from his native reed, impaled him kicking plenty on a cruel bare hook, and cast again. Business looked up at once; a strike, a fight, and a trout, which smelt right fishily and provoked visions of a frying pan and much picking of bones. With a prayer and an apology to the sainted Izaak Walton--who at any rate should a heapsight more be a saint than some of those elected--I tucked away my flies and fared forth to collect grasshoppers.

But it was a day of humility all around; if I was humbled by the forswearing of gentlemen's bait and the adoption of vulgar, goggle-eyed, parasitized, tobacco-spitting grasshoppers, what must have been the feelings of the botanists, who forswore their allegiance to Green Things and became for the nonce most energetic collectors of said loathsome grasshoppers? For be it known, the orthopterous crop was sparse, and it generally took longer to round up a grasshopper than it did to make connections with a trout after the bait was secured. So while Dr. Wolcott and I whipped the stream and had all the fun, Profs. Pool and Williams and Mr. Deussler took the butterfly nets and worked far harder afield to keep us supplied with bait. Their conduct was simply perfect, for not only did they steal up quietly with the hard-earned bait, but they guardedly spoke words of commendation and even applause when we landed a fish, in a manner most tickling to our vanity. It was great sport, and I don't care if Dr. Wolcott <u>did</u> catch more than I; it simply shows that he is accustomed to more plebian methods, which is nothing to brag of. If those trout had been versed in orthodox piscatology I would have shown him!

So with much bait-collecting, some fishing, a little botanizing, zoologizing, and photography, we passed the day, returning home late in the evening. We did not have a very large mess of fish for seven of us - I believe there were 17 in all - for many of those caught were too small to keep, and the largest was about twelve inches long; but we all enjoyed

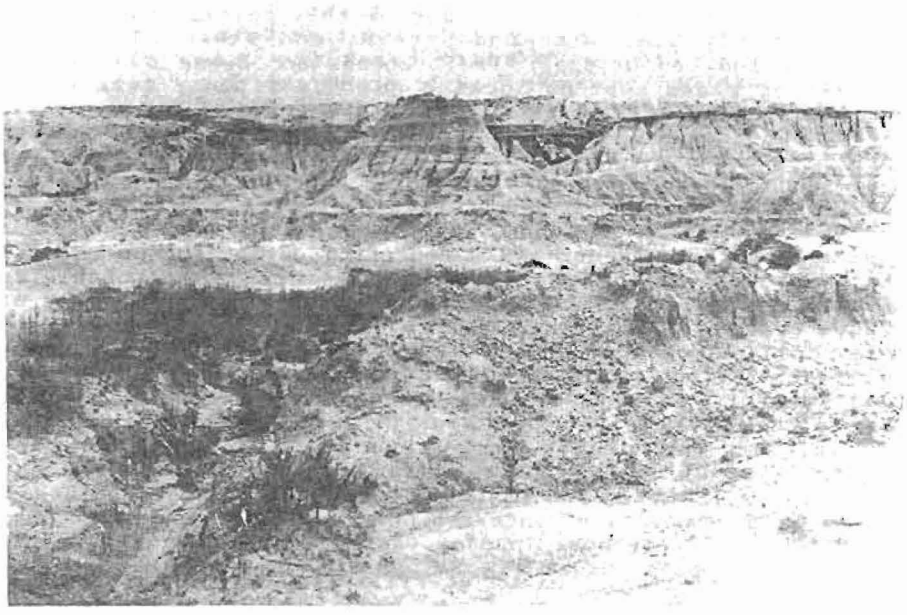
the expedition, and the perfect manner in which Prof. Pool fried the fish entitles him to our lasting gratitude.

June 27th was devoted to a drive to Warbonnet Canyon, five miles west of Monroe. Our road lay well out in Hat Creek Valley, and we greatly enjoyed the view of the picturesque south ridge as we passed along several miles of it. Warbonnet is the wildest, deepest, most densely vegetated, and altogether the most interesting of the canyons visited in this region; it is in the recesses of its deep valleys that Transition conditions are to be found if anywhere in the state, but it is too early to decide this point. The road is delightfully bad, with sharp turns and steep climbs and descents and bad bridges; low branches and dense overhanging masses of vines kept us ducking for our lives. Less blase roadsters than Bill and Sorrel would have gone crazy and run away, but they understood their business and stuck to it. We drove up the canyon for about two miles, where we camped and had lunch, after which each acquitted himself according to his desire - Leussler and Dawson following the valley in search of butterflies, Pool and Williams visiting the high points for plants, and Dr. Wolcott and I confining our attention chiefly to the lowest and dampest regions in search of beetles. We got a fine series of the beautiful Cychrus elevatus [a type of Tiger Beetle], collecting thirty or more, whereas my entire previous takings about Omaha and Lincoln had been about eight specimens. The specimens here were much darker than those I had seen previously. In one deep gulch, only a few yards above the level of the valley, we found numerous bones of bison, and one well preserved skull. I took numerous photographs of high points and attractive vistas. The day passed too quickly, and it is a temptation to go into detail about certain points of interest. Well up the canyon we found evidence of beaver work in past years, and on the way home we followed Warbonnet Creek far out into Hat Creek Valley to see their more recent work.

In addition to these long drives, we of course made many shorter trips in various directions, individually or in groups of two or three, or occasionally the whole party. Dr. Wolcott and I generally went together on account of our common interests, and many such trips will not be made the subject of special notes, the results instead showing up in our collections and photographs. A few of these little journeys, however, deserve mention.

On June 20th Dr. Wolcott, Dawson and I went out almost to Prairie Dog Creek, the bad lands being our objective point; but I had the good fortune to chance upon a colony of tiger beetles - Cicindela cinctipennis [a type of Tiger Beetle] - showing remarkable range of variation, and forthwith we settled down and spent our entire remaining time collecting these specimens, each getting fifty or more. They were found over an area 50 yards wide and 200 yards long, bordering a dense growth of Symphoricarpos [Snowberry], the soil of this region having been worked over pretty thoroughly by pocket gophers the previous year. On the bare patches where the gopher hills had been washed down, and among the scattered growth of grasses and milkweeds, we found the beetles. They indulged in rather short flights, but were hard to see and

sufficiently active to make their capture difficult. The same species we found sparingly in the bad lands on other trips, but this proved to be our best opportunity for collecting them, and we secured quite satisfactory series.



In Prairie Dog Creek Badlands, Sioux County, Nebraska, June, 1911.

Thomas County, July 3-13, 27-30, 1911

Our party in Thomas County was reduced to Profs. Pool and Williams, Dr. Wolcott and myself. Mr. Dawson stopped over for two days to look into the status of the pine-tip moth, when he returned to Lincoln. Mr. Leussler had left Sioux County two days ahead of our party, to resume his duties in Omaha. We reached Halsey on the morning of July 3rd and remained there until the 13th, Dr. Wolcott, however returning to Lincoln for several days during this period. Our first trip to Cherry County occupied the time from July 27th to 30th.

The Forest Reserve Station is two and a half miles west of Halsey, in the valley of the Middle Loup River. The river runs through sandhills, and the valley is rather restricted, being at no point in this region more than a mile or two miles in width. The valley is fertile and contains some sodded "ranches" - a perverted term, applied indiscriminately to anything from a half-acre truck garden to a ten-section cattle range. The Station is provided with very good buildings, and about fifteen men conduct the experimentation, which is an effort to "reclaim" a portion of the sandhills by the planting

of pine trees of various kinds. If these can be induced to grow, the shifting sand will be held in place, minor vegetation will have a chance to gain a foothold, the decay of this vegetation will form humus, and ultimately a soil of sufficient depth will cover the surface to resist the action of the wind. The experiments have now been carried on for nine years, and in many ways have proven successful; but the progress is necessarily slow, and it has not yet been determined whether the effort, as a whole, will be a success. One factor of great importance, however - a condition which has been brought about by settlement of the country - is the limiting of prairie fires to comparatively small areas. Before the country was settled these fires were of very common occurrence and of great extent, resulting in the undoing almost yearly of all that Mother Nature had done to reclaim these wastes at her own instance. The vegetation was swept away by the fires, the winds carried every vestige of ashes and unconsumed materials to the ends of the earth, and the sand, having nothing to hold it in place, was drifted about by the millions of tons. Now, with fires greatly reduced in frequency and confined to much smaller areas by cultivation, by the grazing of large tracts and the consequent reduction of dry, dead grass, and by persistent fighting when they do start, the region is being given a much better opportunity to mend itself, and the pine planting experiment as an additional aid is quite reasonable and commendable.

The experimentation at Halsey seems to be well handled, which makes it rather difficult to understand why, with plenty of men available and good land and implements and water in abundance, there is no serious effort to supply the table with vegetables. One cow is kept to furnish the superintendent with milk and cream; the men use condensed milk, bought in small quantities and the supply is frequently exhausted. A few hens are kept, sworn to lay for the superintendent only; the men have, when they have anything in that line, not hens' eggs, but "ranch eggs" from "up town," which are an entirely distinct class of ova. Butter is generally supplied, but during our visit it was at times lacking for several meals in succession, and when it did appear it was semi-liquid, there being no ice. Fresh meat is a rarity. Canned vegetables, cured meat - ham or bacon or dried beef - and canned fruit, were the features of nearly every meal, and became distinctly monotonous even during our short visit. Of course, it is food, and perhaps one should not quarrel with his victuals, but it really seems as though a little peevishness might in this case accomplish something, when cows and chickens and a garden and ice could be cared for and profited by without adding to the force of men, and furthermore would almost certainly effect a considerable saving in the year's table expenses. When we went to get cots from the second floor of the bunk house we found dozens of Cimex lectularis [Common Bedbug] executing manoeuvres [sic] in the folds thereof. Fortunately it is their nature to react negatively to light, and a thorough sunning of the cots, aided by microscopically careful manual extraction, resulted in the possession of usable beds, which we moved far away. A tent was furnished us and we set it up midway between the main building and the bunk house. I slept there for a night or two, but it did not appeal to me very strongly, as I prefer to take my fresh air

straight; so I hied me to the hills, having acquired a penchant for sky bed-rooms while in Sioux County. A fine hill back of the station suited my fancy, and there I wasted many hours in sleep.

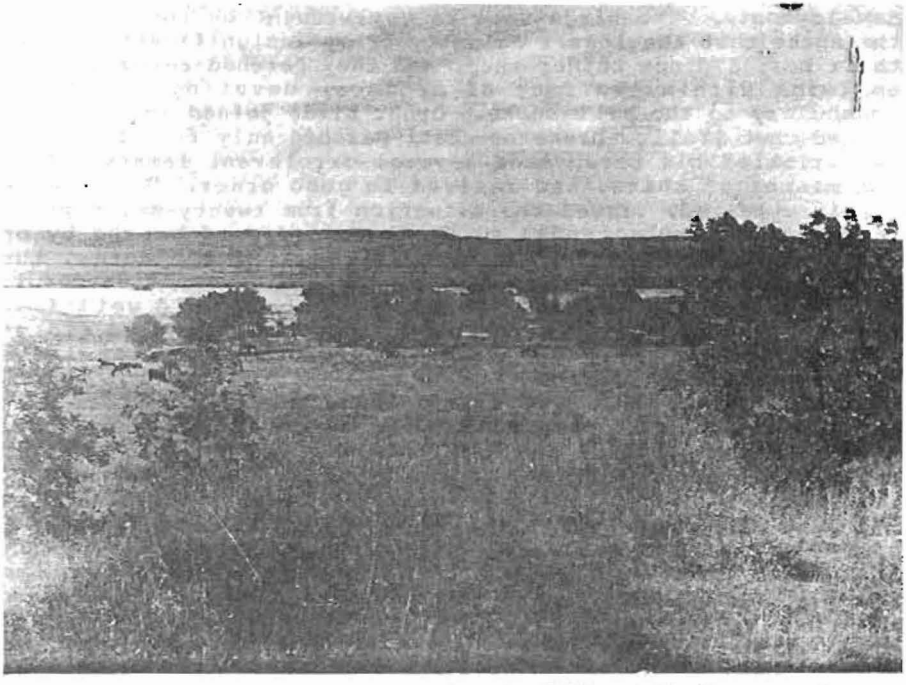
One of the real joys of our Forest Reserve experience was the bathing in the river. The volume of water is considerable, and the fact that we could rarely find places over three feet deep did not detract from the cool delight of fighting the swift current. I indulged in a swim at all kinds of hours, even at midnight, the invitation of the water being especially tempting after a hot trip in the sandhills.

The region hereabouts is divided sharply into just two kinds of country - the sandhills and the valley. The sandhills are high and rugged, covered in the main with "bunch-grass," with here and there areas, generally on slopes or in depressions, thickly covered with shrubs. There are enough suitable grasses that it is a good grazing country.

The most striking and characteristic things about the sandhill country are the "blow-outs." Great hills of sand are attacked by the northwest winds, which in the course of years excavate large cavities, beginning at the vulnerable point near the crest and working down and backward, so that finally the one-time hill becomes but half a hill, with a deep hole in place of the other half. The sand from this cavity is carried over the crest and scattered loosely in the sheltered region beyond, burying and destroying the vegetation existing there and establishing new conditions of which better adapted plants avail themselves. In the course of time the blow-out "blows itself out," incoming vegetation gets hold of the shifting sand, keeps it in place, gradual filling occurs, and ultimately the blow-out is revegetated - in other words, no longer a blow-out. But meanwhile the process has gone on and new blow-outs have appeared, so there is no lack of numbers. And in some dry year, or following a prairie fire, the old blow-out loses its vegetation, is again at the mercy of the northwest wind, and again becomes active blow-out. This program is not likely to be much varied in many years to come, except through the agency of the factors already mentioned which aid in the retention of the vegetation. Blow-outs originate wherever the surface is disturbed by cultivation, by the plowing of fire-guards, and where roads are run through the sandhills; but it is rare for these induced blow-outs to depart materially in their manner of growth from that described for the typical blow-outs of the hill-sides, the northwest wind being the active agent.

One peculiar feature of this formation of blow-outs by the northwest wind is the entirely different aspect of the sandhills as viewed to the eastward and as viewed to the westward. To the eastward every blow-out is visible, and the landscape is scarred with patches of white sand; while a view to the westward shows practically none of the blow-outs except where the contour of a particular region has caused a blow-out to depart from the typical form, or where the sand carried over the rim of a blow-out has not yet been covered by Redfieldia [Blow-out grass], Muhlengergia [Muhly grass], or some of the other forms of vegetation which perform that duty.

To the eastward the country appears scarred and broken; to the westward the aspect is that of a succession of grass-covered hills.



View north across Middle Loup River from Sandhills--1/8 mile east of Forest Reserve.

The valley of the Middle Loup in the vicinity of the Forest Reserve is marked off in rather distinct zones: (1) the river with a dense margin of ash, box elder, elm, cherry, and willow, thickly interspersed with indigo bushes, milkweed, poison ivy (a jungle of this, with the largest leaves I ever saw), golden-rod (not yet in bloom), and many other plants; (2) a level grass-covered tract with few shrubs, covering the greater area of the valley; and (3) a wooded or shrubby zone along the base and extending up the side of the sandhills which bound the valley.

In the late afternoon of July 7th, I was enjoying my usual evening walk along the outer edge of the border of trees skirting the river, and had reached a point half a mile from the Forest Reserve Station, when my attention was attracted by persistent alarm notes of the Bell's Vireo, one of the very common birds in the bushes along the river. I made my way through the plum thicket, and, guided by the calls, had no difficulty in finding the nest, containing young birds, with both parents fluttering about it in great excitement. The nest was well out on a branch, suspended in the usual way between diverging twigs, not over two feet from the ground. I expected to find a blue jay responsible for the disturbance,

but instead it proved to be a bull-snake, which I did not at first see, as it was in the branches above and several feet away from the nest. The snake had observed my approach, and was absolutely motionless, except for the playing of its tongue. I settled very slowly, so as not to alarm the snake, to an easy position with one knee on the ground, and awaited developments. The birds were so overwrought by the menace of the snake that the lesser calamity of my insignificant self by their nest did not bother them, and they perched several times on twigs within two feet of my face, devoting all their vocabulary to the bull-snake. Other birds joined in. A long-tailed chat [Yellow-breasted chat] perched only four feet from me, wrinkled his brow, made several irrelevant remarks after the manner of chats, and retired in good order. An orchard oriole appeared, viewed the situation from twenty-seven positions in as many seconds, said not a word, and passed by on the other side. Meanwhile, for at least five minutes, the snake did not move a fraction of an inch; tense and watchful, with the head and several inches of its body held well away from the branch above which it was twined, it devoted all of its attention, until the "memory" wore away, to the large object which had suddenly moved into the region, but which, after all, was probably harmless; then it slowly doubled back on itself, darting its tongue--a most delicate organ of touch--here and there to pilot its way safely, and started down the branch. Reaching the body of the tree, which was in fact only a shrub, not over six or seven feet high, it descended with great deliberation, finally reaching the branch on which the nest was placed. Here it paused for a moment, then started out along the branch. Several inches from the trunk it encountered the top leaves of weeds which extended up into the lower branches of the tree, and thrusting its head out upon these it tried their strength; but they were weak and flexible and would not support its weight, so that course was abandoned for the more rigid branch. Slowly the snake crept along, until finally the nest was reached and the sensitive tongue touched its rim. Up to this time the entire behavior of the snake had been deliberate; no rapid movements, no hurried exploration of branches. But now a stimulus was encountered which very plainly was not unknown to the snake; with a rapid movement, almost a jerk, it raised its head several inches above the next, opened wide its jaws, and struck! . . . Really, that is all there is to the story, for the snake's conduct, not mine, is the subject of these notes; but in my capacity as referee I may add a few words. Being, if you please, quite as highly organized and functioned as an ordinary bull-snake, it came to pass that even as the snake struck down upon the defenseless heads of the baby vireos, I grasped the reptile amidships and hauled in enough slack that the blow fell short of the nest. That is all. The subsequent court-martial and execution have no place in this narrative.

Dickcissels were nesting in the scattered bushes of the valley, and several nests were found. My attention was drawn to one nest by the flight of a cowbird from it. The nest was in a very small bush, only eight inches from the ground, and had been pulled out of shape, so that one edge was very low. One young dickcissel, about four days hatched, was in the nest, and another on the ground, apparently having been kicked out by the cowbird. There was also one egg of the dickcissel,

apparently infertile, and an egg of the cowbird, doubtless laid by the bird I had seen leaving the nest, as it proved to be perfectly fresh. My means of ascertaining its freshness, I do not scruple to confess, or rather boast, was the simple expedient of busting it open. Whatever may be said of the unwisdom of molesting the processes of Nature's ordained plan, I draw the line just short of the cowbird, considering her definitely without the pale, and one of Nature's worst blunders. When I find cowbirds' nests in a nest they come out, and I flatter myself that I have saved hundreds of young birds, of dozens of species, by removing these false gems. I did a little job of carpentering, shoring up the nest to a proper level, adding a scantling or two and repairing the wainscoting, replaced the fallen infant and went on my way. - It is unusual for the cowbird to deposit an egg with young birds so far developed. - Four days later the nest was found again pulled far down at the side and the young birds were gone.

I copy a very unscientific note from my field book, under date of July 10th, just as it stands: "Caught a mouse this morning in the upstairs room where we keep our things, and plucked it from a small box into a pail of water. Suddenly remembered that I had nothing against the mouse, and dropped it a tissue-paper rope, up which it promptly shinned and sat shivering on the rim of the pail, while I stood there ashamed of myself. I essayed to stroke its head with a finger-tip and it sat still; so I took it in my hands and warmed it up. Then I held it near the floor and tried to push it out of my palm with my thumb, but it ran around the thumb and signified its preference to remain in the warm quarters. So I babied it awhile and finally pushed it off, whereupon it faded promptly into the ample hole through which the water-pipes pass."

I do not say much about spiders in these notes, but throughout the summer they came in for much attention, and I collected hundreds of specimens from every imaginable location - from tunnels, holes in the ground, webs between twigs or grasses or flowers, from the summit of bare buttes, from blow-outs, from the surfaces of ponds, from concealment under logs or stones; many of them were swept from vegeration by means of a net, or beaten from pines and cedars or from deciduous trees in the various regions which we visited. The spiders of Nebraska have not been studied, and it was my aim to get together a collection for classification during the winter. So between remarks about other things there might appear much about spiders, were it not for the fact that I have concluded to eliminate such notes for the sake of brevity, though in the midst of all these pages the statement is unconvincing.

On July 12th there was a violent hail- and rain-storm at 4:30 p.m. Over an inch and a half of rain fell within a few minutes. The hail did very great damage to crops, the leaves being entirely stripped from corn and the bare stalks bent over flat upon the ground by the violent northwest wind. There had been other rains during the month, and the result was such an unusual amount of moisture that Prof. Pool's investigations regarding soil moisture were seriously interfered with, the month being abnormal in this regard. Many birds were killed by the hail. Italians working on the

railroad at Halsey were said to have found large numbers of dead prairie chickens, but I was unable to learn the facts. On the 13th Profs. Pool and Williams brought in a short-eared owl with a broken wing, doubtless a victim of this storm. I was busy with correspondence and had no time to photograph the bird, but Prof. Pool got a good picture. The bird was released among the pines, with a prayer that he and Teddy might not meet.

Cherry County, July 13-26, 1911

On the evening of July 13th, Dr. Wolcott, Prof. Williams and I left Halsey for the Cherry County lakes, Prof. Pool having decided to remain at the Forest Reserve. We spent the night at Thedford, and early on the morning of the 14th took the Brownlee "stage" - another loose word, applied throughout this region to any vehicle making theoretically regular trips over a given route with mail or freight. In this instance it was a three-seated light wagon, with enough passengers and baggage to fill it uncomfortably. We started in a light rain, and showers continued most of the day.

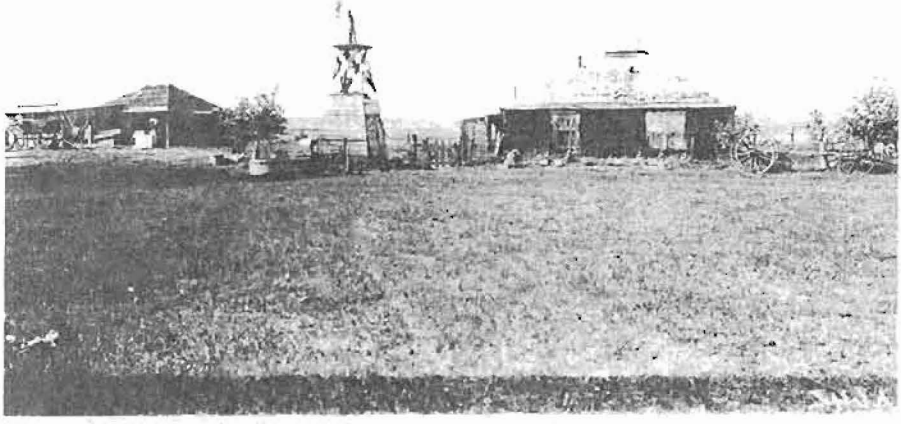
We reached Brownlee after a thirty-mile drive at about 12:30, had "dinner" there, and went on with Rivers Stilwell, who had driven the thirty miles from his ranch to meet us. He had a large wagon and four horses, so the going was much easier than the first half of the trip.

Along our route were many evidences of great destruction by the hailstorm of the 12th. Corn was almost ruined, and the grass on every slope was laid flat and all combed one way by the rush of water, for a heavy rain had followed the hail.

We passed by Dad's Little Alkali, Dewey, and Clear Lakes, which looked very interesting to me after the eight years' interval since my last visit, but of course we could not stop - though the presence of a nesting colony of grebes at the east end of Dad's Lake afforded great temptation. We finished our sixty-mile drive at Stilwell's ranch at 6 p.m. central time. When I last visited this region, in 1903, Mr. Stilwell occupied a soddy on the bank of Hackberry Lake, and our quarters were in another soddy near by, arranged for accommodation of hunters. In 1907, however, the water in the lake rose several feet, and the old place was abandoned for the present location, near the lake shore a quarter of a mile farther north, where a comfortable two-story frame house was erected.

This entire region is underlaid by a hard stratum, rising gradually to the westward. In most of the area the sandhills cover this stratum uniformly, but where a valley cuts low enough through the hills to reach sufficient moisture, a luxuriant growth of grasses has laid hold upon the sand and a fine "hay valley" is the result. Where the cut is still deeper a lake is formed. These lakes are uniformly fed by seepage, occasionally by springs, at the western end - or rather the northwestern end, for with interesting frequency they are elongate in form and their general direction is from northwest to southeast. Ordinarily the northwest end is characterized by a boggy tract, filled with ferns, until a

point near the water is reached, where there is an area of treacherous black mud. The lakes vary remarkably in the character of the water, and correspondingly in the animal and plant life which they maintain. Chemical analyses have shown that the degree of alkalinity varies greatly, the water of some of the lakes containing twenty times as much alkali as that of other lakes; and strangely enough, a comparatively fresh and a markedly alkaline lake may be found near neighbors, and to all appearances drawing upon the same subterranean sources for their water supply.

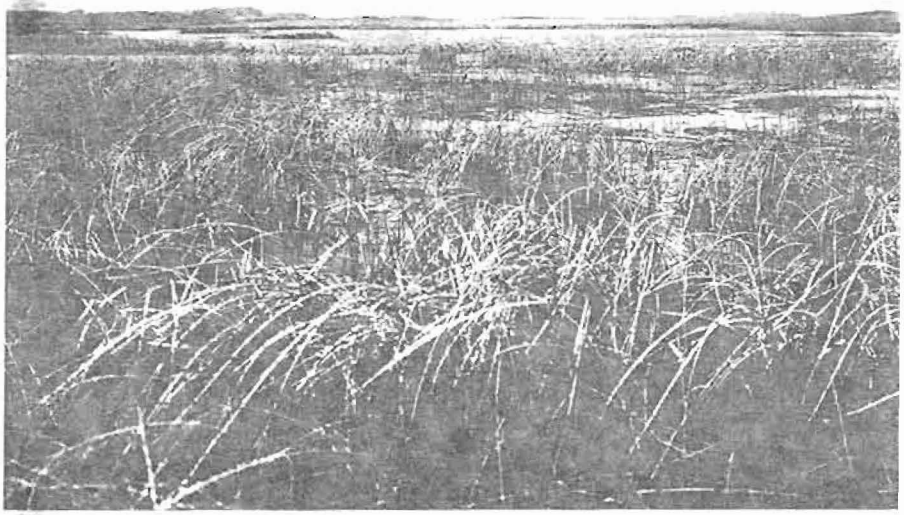


Stilwell Ranch, Hackberry Lake, Cherry County, Nebraska, June, 1903.

Aside from the pines of the plains and ridges north, and the deciduous growth which marks the course of each stream, Cherry County is almost bare of trees. In the lake region there is an occasional wreck of a "tree claim," with shattered ranks of cottonwoods, and in some places these trees have grown quite well; but aside from these planted trees, and away from the streams, trees are very rare, an occasional hackberry being found on a sheltered hillside, or a clump of plum-trees on the hill slopes south of the lakes.

Hackberry Lake, being the most convenient as well as one of the most interesting lakes, received more of our attention than any other lake. It is one of the freshest of this lake group, of which there are twenty-one altogether. Three or four of these lakes bearing names are mere marshes, while there are numerous clear-water ponds which on account of their small size are not dignified by names. Hackberry Lake is two

and a half miles long and about a mile wide. The greatest depth found by Dr. Wolcott during extensive investigations was seven feet. The general direction of the lake is from northwest to southeast, but I have elided [sic] this in my notes to north and south, and will keep up the bad habit. The north side is bordered throughout its extent with a growth of tules, varying in breadth from a mere fringe to several hundred yards, while the south side is almost barren of this growth. This might seem to be again the work of the northwest wind, but not all of the lakes bear out this theory, and as that malicious wind has enough crimes definitely charged to it, this one opportunity of giving it the benefit of the doubt is cheerfully welcomed. The lake bottom is covered, throughout most of its exent, with Myriophyllum [Water Milfoil] and Chara [Green Algae], and in places with Lemna [Duckweed] and Potamogeton [Pondweed]; and this submarine garden, though ample enough in its tones of green and yellow, is of surprising beauty when viewed under the right conditions of light.



Hackberry Lake, Thomas County, Nebraska, across the water, June, 1907.

Next we came upon a highly excited group of killdeers. They are always worrying over people, but when they are as crazy and garrulous as on this occasion it means that they have eggs or young - not necessarily in the same township, however, for they go longer distances to borrow trouble than any bird of my acquaintance. We spent some time looking for a nest, and while thus engaged R. Wolcott caught sight of a young bird a hundred yards away, on a little cape which ran

down among the tules. So we walked in that direction, whereupon the young bird disappeared. Approaching the place where it had been seen, we walked very slowly and examined every inch of the ground, and I had the good fortune to find the youngster, tucked away in a hoof-print in the damp soil near the water. Its back was even with the level of the ground, and its bill was extended flat on the surface, the colors of the bird blending wonderfully with its surroundings. I had started out with only my kodak, but this was a subject which I wished to photograph with the best lens available, so I hurried back to the ranch, nearly half a mile away, for my camera, while Dr. Wolcott looked about for other young killdeers. Returning on the run, I found my haste entirely unnecessary, for the young bird was precisely as I had left it. The photographing was soon out of the way, and then we experimented with the bird to see how fully it depended upon concealment, or rather protective coloration, for safety. Walking briskly about the bird had no effect. It remained motionless even when touched lightly with straws and with our fingers. Finally I went a few yards away, then turned and walked rapidly back, the last step bringing my foot directly over the bird. Still it remained perfectly quiet; if I had finished that last step I would have finished the killdeer. Then we picked it up to see if it was really alive, and it was, very much so, and forthwith found its voice, inherited from a long line of vociferous ancestors. When released it ran with surprising speed to the water's edge, and when we followed took promptly to the water, wading as far as possible and then paddling along almost as expertly as a young duck, until it was finally lost to view among the tules a dozen yards or more from the shore.

Next a black tern colony was located, far out among the tules in water two feet deep. The nests were on floating masses of vegetation, and contained both young birds and eggs. The young were beautiful, fluffy little things, and showed little fear of us; but when informed by their frantic relatives overhead that we were a bad lot, they dutifully took to the water and paddled away. We rounded up two of them and placed them in a nest, and with Dr. Wolcott's assistance I got their photograph. The old birds were very much disturbed, and swooped down toward us in an endless procession, there being forty or fifty of them, and each having as many swoops as he wished. They frequently touched us with their wings. Several Forster terns joined in the demonstration, and with their superior mastery of invective almost disheartened us; for in the whole realm of nature I know of no term of scornful, sarcastic villification which approaches that applied to his disfavorites by the Forster tern.

The morning of the 18th was cool and breezy, the wind being in the southwest and the weather alternating between sunshine and showers in surprisingly rapid succession. It had rained rather sharply during the night. I spent the greater part of the morning collecting beetles and spiders along the lake shore, and as the afternoon was more settled, Dr. Wolcott and I took a trip around Hackberry.

I photographed a ruined sod-house near the north shore of Hackberry Lake, its lines suggested such utter lonesomeness

and desolation. Sod-houses are much used here, for obvious reasons, and some of the wealthiest ranchers live in them; but I can not help feeling that, wealthy though they may be in cattle and collateral, they must be poverty-stricken in imagination and sensibility. If I were condemned for my crimes to live in this region I would build me a mansion of boards, even if I had to go without corn-meal; for I like not these sod sepulchres.

But a frame house is not necessarily a home. While still ruminating over the sadness of soddies, I came upon a frame shack - one of the two "buildings" on this side of the lake - and as the door was boarded up I looked in at the window, having mislaid my manners. It is difficult to describe that interior, for everything impinged violently upon the senses at once. A bed was in the corner, with tattered, moth-eaten bedding, upon which were piled ragged clothing, yellow breakfast-food boxes, a jug, some lumber, minor implements and tools, and stacks of papers and magazine (bespeaking a literary character?). Long pine boards were thrust diagonally here and there from floor to ceiling according to their dimensions, presenting the aspect of a game of jack-straws on heroic lines. The floor was covered with everything but carpet; the corners were pyramids of possessions. Such systematic chaos never before met my eyes. Nothing about the place suggested that a woman had ever entered it, which is certainly a piece of unbelievably good fortune for some woman. - All of which would not have been mentioned except for the yellow-headed blackbird. He was in the middle of all this rubbish, hopping about quite optimistically. I could not imagine how he had entered the place, but as it seemed unlikely that he would find his way out I walked around the corner of the house with an idea of breaking and entering. I reached the other side just in time to see him come out of a small opening near the floor and fly away. From the fact that the blackbird had sought this means of exit and made his escape during the few seconds which passed while I walked the distance of less than ten yards, it was very plain that the bird knew the premises well; this accuracy and effectiveness of conduct was no first performance. It would be interesting to know how often he visited the place, and his opinion of humanity.

On the 19th we made another raid on Hackberry, Dr. Wolcott taking a boat and devoting his attention to soundings and recording temperatures, studying the bottom vegetation, and collecting plankton, while Prof. Williams and I followed the south shore. There was no visible cause for a disruption of the amity in which we had lived up to this time, but somehow there sprang up a clash of arms between "the army," which was Prof. Williams, and "the navy," which was Dr. Wolcott, and whenever the two branches of the service came together there was a pitched battle. Ammunition was scarce, and on one occasion the army carried a heavy projectile (a tin pail filled with sand) for a half mile, to the point where very ordinary strategic foresight would inevitably place the next battle-ground. When the navy came ashore at this point the projectile was hurled with deadly effect, and the commodore was almost drowned by the splash. I decried this hostility from the start, being a man of peace, but my kindly offer to serve as an unprejudiced and scandalized arbitrator

was turned down with scant civility. However, the war was over before lunch-time.

We left Stilwell's ranch on the morning of the 26th. . . . . Our route to Thedford was the same as that followed when we came.

Sidney, Banner County, Scottsbluff - August 1-9, 1911

Our party of four left Thomas County on the evening of July 30th for a short visit to Banner County. The best we could do in planning our trip west from Halsey was to leave there in the evening, spend the night at Seneca, and take a morning train to Sidney.

The western boundary of the sandhills is sharply marked in the region traversed by the railroad. About three miles east of Alliance the sandhills end abruptly, and the transition to clearly defined plains conditions is immediate, this definition being visible from the car windows for several miles north and south. To the southward, however, the line of sandhills swerves sharply to the westward, roughly paralleling the valley of the North Platte River, so that the true sandhill area is again entered about five miles south of Alliance. New flowers appeared in numbers, notably Mentzelia [Mentzelia], prickly poppy, and mallows.

Arriving at Sidney in the eatly afternoon, and having the time at our disposal until midnight, we undertook short trips into the neighboring country. The botanists went northwest, while Dr. Wolcott and I went northeast and devoted our attention to insect collecting. Several species of Eleodes [a darkling beetle] were found, and the first Solpugids [a type of sun scorpion] of the trip. These anomalous creatures were very interesting to me, as I had never before seen them, and the Doctor's advice not to pick them up with my fingers was entirely unnecessary; their plainly visible jaws and their pugnacious attitude when disturbed were sufficient deterrents in themselves, and my captures were made with circumspection and tweezers. The bite of these animals is said to be extremely irritating, and is doubtless worse than that of any spider found in Nebraska, though probably not in any sense dangerous.

We slept four or five hours at Kimball and took the "stage" at 7:30. The drive from Kimball to Harrisburg was uneventful, but interesting on account of the opportunity it gave of further observation of plains conditions. For about ten miles north of Kimball our road lay through a level country, sparingly spread with disintegrated granite, the surface uninterrupted by buttes or valleys. Efforts at farming were to be seen here and there, but none of them appeared successful. Cactus ("prickly pear") was fairly common. Cleome [Rocky Mountain Beeplant] again appeared, and Mentzelia [Mentzelia] was at its best. Russian thistle was observed at many places along the road. The thistle of the sandhill region was here replaced by one of like form and size, but with the flower a beautifully delicate lavander instead of white. The most notable grasses were buffalo grass, grama grass, and Stipa comata [Needle and Thread], the

stalks of the latter being conspicuous. There was also some Hordea [Barley grass]. Verbena brachyosa [Vervain] with its radiating branches were growing commonly along the road, an adaptable plant and a good traveler.

About ten miles north of Kimball the character of the country changes slightly; the disintegrated granite disappears and the surface shows more variation. This is about where Banner County is entered. Two species of Psoralea [Scurf Pea] were very common, and Calamovilfa longifolia [Prairie Sandreed] (locally known as "sand-grass") became one of the most notable items among the grasses.

The rise is quite gradual to the south ridge of the valley in which Harrisburg is situated, and nothing is seen of the country beyond until the ridge is almost reached, when a descent of about 300 feet through a rocky cut reaches the level of the valley, with Harrisburg only a mile and a half away.

Banner County

Harrisburg is situated in a valley which runs east and west, and which averages about ten miles in width. The southern side of the valley is marked by bluffs from 100 to 300 feet high, with rocky buttes standing out sharply and separating the draws which lead up into the bluffs, and which in the language of western Nebraska are called "canyons" - a much abused word, signifying anything from a bare fifty foot gully to an entire valley and its numerous branches. The ridge to the north of the valley is higher and less broken, and the prominent points are called the Hogback Mountains and Wildcat Mountains, each consisting of one peak so the plural form of the name is honorary. Their altitude is about 5,300 feet, perhaps 500 feet above the low points of the valley.

The town of Harrisburg consists of half a dozen stores, a court house, a hotel, and a few accidental houses. It looks very lonely from the heights. We entered it with fear and trembling, for it was beyond reason to expect proper accommodations in the little one-story hotel; but a gratifying surprise awaited us, for the place was well kept, the food was good, and the people were very accommodating.

The collecting in the valley was strictly of plains forms, to a great extent identical with those found at Sidney and in similar localities in Sioux County. The most striking thing was the abundance and variety of Eleodes; we found nine species during our stay there and several closely allied forms. It is doubtful whether there is another locality in the country which would yield as many. The members ranged from hundreds or thousands of the common species to two individuals of the biggest, rarest one - not before taken in Nebraska. As the valley proper is entirely destitute of wood, and without the yucca plants common throughout most of the region, the only shelter for these insects was found in burrows or under dry cow-dung; upon kicking over one of these "houses" it was not unusual to find a dozen or more of these insects, sometimes three or four species together. Toward evening and on cloudy days they moved about freely, and these

occasions furnished our best collecting. The first examples found of any species were cherished as great discoveries, when perhaps within twenty-four hours we would encounter a "run" of the kind and they would soon be classed as too common for further collecting. I was the fortunate finder of the first "big fellow," which is about the size, shape, and color of the south half of a five-cent cigar. For three days thereafter the Doctor stalked about green-eyed and morose, until he found one, and then the atmosphere cleared. He squared matters by finding the only Solpugid found in Banner County.

We met a Dr. Page in Harrisburg, a Yale graduate who practiced medicine among the Sioux Indians for some years and then in the absence of anything worse to do drifted into this country. He is now county clerk, and showed us in his office maps indicating Bull Canyon, situated in the western part of the county and very near the Wyoming line. It is in this region that the highest altitude in Nebraska is recorded - 5360 feet - not on a peak, but on a rolling plateau above the canyon. He pointed out this region as a desirable place to visit and we agreed with him, so a trip was arranged for Sunday, August 6th. The botanists had left the day before for Scotts Bluff, so they did not get to visit this interesting region, of which we first learned after their departure. It was impossible to get a livery rig, and the account of how we got our team would be quite a story in itself - and a photograph of the team would bear out the story. We finally got the component parts together - one horse about 17 hands high and the other apparently about 7, and with no more ambition than a peddler. We did not get started until noon, and then bade fair to ride into a heavy storm, which, however, passed along the north side of the valley, Hogback and Wildcat being veiled in rain for some time. A peculiar feature of the storm was the presence of a strong wind from the northwest in its wake, while the storm itself moved northeast. This wind was remarkably cold, from which we inferred that it had been accompanied by hail, though it had the appearance of a rain-storm. We passed Gabe Rock, a massive detached butte set out from the south ridge, and followed the valley westward, past Long Canyon, which looked rather uninteresting, and at about two o'clock reached the entrance to Bull Canyon. The entrance was quite commonplace, and gave no indication of the things beyond - which suggests the possibility that I may have misjudged the quality of Long Canyon as well.

Bull Canyon proved to be deeper, broader, more rugged, and fuller of vegetation and animal life than any other point visited in this region. There is a good stream with splendid springs, and the deciduous vegetation is luxuriant. The bull pines are present on the ridges and sparingly in the canyon, but cedar is the prevailing form of conifer. All of the branches of the canyon end in sheer walls, some of them quite high. We spent four hours visiting various portions of it, finding our way out at one point onto the high plateau, but not at the actual point of highest elevation [in Nebraska].

The birds were numerous and varied, and here we found our first new bird of the summer for the state list - the crimson-fronted finch [House Finch], of which numbers were seen about a spring and in the cedars.

In Bull Canyon, Banner County, Nebraska.

We were constantly on the lookout in Banner County for rattlesnakes, of which we wanted photographs and specimens, but our luck was poor. The botanists found one, but after they had "collected" the rattles and fangs as souvenirs there was little desirable about the specimen for pictorial or zoological purposes. We made long trips to alleged "dens," one of which was so notorious and dangerous that several acres had been specially fenced off for the protection of grazing stock; but not a rattler did we find. Everyone had a story to tell about rattlers killed or seen yesterday, or last week, or in 1880, but these did not enhance our gallery or our collection.

On August 7th we started at 8 o'clock in the morning for Hogback and Wildcat Mountains, having arranged to meet the stage with our baggage at a ranch near the north ridge, four miles east of Wildcat.

We stopped at a ranch two miles south of Hogback, and found it the best kept place we had seen, with carefully irrigated garden and better-looking crops than usual in this region. The lady of the house was alone, and she laughingly admitted while she geared up the windmill to give us a drink that when she had seen us coming she had locked the door, but that a nearer view had convinced her that we must be the "university people" of whom she had read in the paper. All summer long we were well advertised wherever we went, but the news always came to us second-hand; I do not think a member of the party saw a line of print about our crowd. Doubtless this was a distinct loss to us, for the country write-ups of such freaks very likely would be good reading. And in this connection, for want of a better place, I shall mention the fact that throughout our travels it was gratifying to note the spirit of friendliness which prevails toward the university. The people of the state evidently believe in it and are proud of it, and the courtesy and good will which we met everywhere on account of our connection with the institution are a matter of pleasant memory. - Our kind lady proved to be a sister-in-law of Prof. Seth Meek, the noted ichthyologist, whom Dr. Wolcott and I both know. Also she took us into the springhouse for a drink of cold milk, and brought us each a piece of angel-food! Although I think there was little about our appearance to suggest either as entirely appropriate, we accepted both without argument.

It was necessary to carry my large camera on this trip, to get some pictures in the "mountains," also my tripod, also a number of alcoholic specimens which could not be trusted without a guardian on the stage, also a canteen and my small camera, my spider-collecting case, and my creel with various implements and instruments and boxes and bottles. The outfit weighed about twenty-five pounds on starting, and the weight increased in geometrical ratio all day. By the time we reached the summit of Hogback I was about as nearly "all in" as on any occasion of conveniently recent memory, and the hot water from my canteen was as sweet as nectar. It is surprising how good any kind of water is when one is really thirsty; in our various trips in bad lands and sandhills and among parboiled buttes this summer I found opportunity to prove this. Dr. Wolcott offered time and again to help me out with my load, as he was traveling light; but it is one of my fool theories that if a fellow can not carry his own stuff he ought to stay at home, or hire a dray, and I tried all summer to live up to this idea.

After coming down from Hogback we walked a mile out of our way to visit a pond, formed by the damming of Pumpkin Seed Creek. There was an irrigating outlet with plenty of cold, clear water, and my merry plunge into this, head first, just to feel the soothing touch of cold water, will linger in my memory as one of the summer's most delightful incidents.

Few mammals were observed in Banner County. I did not hear a coyote. The thirteen-striped gopher [Thirteen-lined Ground Squirrel] was fairly common on the plains, but not in the valley, though one or two specimens were seen there. One was observed during our drive from Kimball, standing up to a head of Oreocharya [Oreocarya?, Cryptantha] and eating the

seeds. Chipmunks were seen occasionally in the canyons. The only prairie-dog settlement observed was within a quarter of a mile of Harrisburg, and was not extensive. While visiting 3d Canyon one day Dr. Wolcott and I spent some time quietly collecting a species of leaf-eating beetle, feeding on low bushes growing in a ravine. We had reached a point where the bushes were quite thick, when we heard something moving near by and saw the bushes shake slightly. While we were watching to see what had caused it we heard a meow! not at all unlike that of an ordinary back-yard cat, and at our first step forward a full-grown and fluffy wildcat burst into the open and headed up the canyon at a terrific rate. I followed as hard as I could go, but with my own full consent to stop forthwith if the wildcat should do so. However, it was too badly scared to tarry, and my only reward was a fleeting glimpse or two of the animal as it rounded the turns of the canyon far ahead. We tried to find its den, or lair, or whatever it is that wildcats affect for domestic purposes, but a careful search along the canyon for some distance was without result. But we had seen a sure-enough bobcat, in perfect working order, and we were much gratified.

Agriculturally, this seems to be a region of great disappointments. Twenty years ago there were many efforts to cultivate crops, and wherever we went in the valley the sites of old-time fields were encountered. Such corn as we saw growing presented a poor, half-starved appearance, and everyone we interviewed conceded that it was a hazardous venture to plant crops - simply "a gamble to get back one's seed," as one farmer stated. I had occasion at various points in the valley to dig out tunnels of Lycosid spiders, and uniformly the soil was dry and dusty as far as I dug -- sometimes fifteen inches at least. Hail is destructive to crops every season. There is not a railroad in the county - not even a projected road, one native advised me, rather boastingly, I thought. There are practically no gardens in the region, and such as there are must be coaxed along with water from wells. Nor does it appear to be much of a stock country; from the heights we could observe with our binoculars the minutest detail in the valley for many miles, and very few cattle or horses were visible. Doubtless, however, we visited the region at its very worst, for the season was exceptionally dry, and it is not unlikely that observations during a normal summer would lead to a more favorable impression of the country.

The general health of the people is good. Dr. Page said that there were very few infectious diseases, and that his practice was confined in the main to "heart" cases - for even this trifling altitude affects many - and to trouble with the eyes, etc. There are practically no pulmonary affections.

As may be imagined, events and people move very slowly there, and it was not entirely clear how even so limited a population makes a "living" - as it must be called. But they have their excitements. A live horse-thief was captured while we were there. The botanists were absent at the time, and I wondered which they had got; but both showed up at meal-time.

The stage picked us up - what was left of us - at a point about ten miles northeast of Harrisburg, at three o'clock in the afternoon (August 7th). The road through the ridge defining the north boundary of the valley lay through rough country with buttes and pines. From the ridge the country north was visible for a great distance, and the green aspect of the valley of the North Platte River, due to the beneficent effect of extensive irrigation projects, was a restful sight after our sojourn in a dusty gray valley. The road down the north side of the ridge was steep and rough, but after reaching comparatively level country it led through a region with good crops - corn and alfalfa and various grains. The excellence of an irrigated country is always accentuated to an absurd degree by its sharp contrast with the surrounding wastes.

Scotts Bluff is a house divided. The radicals write it Scottsbluff; the conservatives adhere to Scotts Bluff. The name appears on signs everywhere, generally in the radical style; for the Government has much influence locally, and in its wisdom it prescribes the telescoped form of the name. Being an outsider, and choosing my own point of view, I lined up with the conservatives, waiting until Newyork and Grandrapids and Sanfrancisco and Saltlakecity shall have writ their titles so and established a precedent worth while. But even "Scotts Bluff" is bad form. Scott lived and moved and had his being in this region many years ago, but in the fulness [sic] of time and under stress of circumstances he laid him down and died on top of the bluff, which was later named in honor of his bones. He has every right to the dignity of an apostrophe in the name of his graveyard; but I have never seen it so written on any map or in any list.

Scotts Bluff is noted chiefly on account of its irrigation projects, of course; it is not so noted, but equally notable, on account of its mosquitoes, which follow irrigation ditches as the night the day. Citizens who write it Scotts Bluff admit guardedly that there are some mosquitoes; citizens who write it Scottsbluff deny that there is a mosquito in the county; and both classes have their porches and windows screened to the limit. I have never visited any town, except along the Gulf Coast, where such unanimity prevailed in the use of mosquito-bar and wire netting.

We found the botanists well fed and happy, but loaded down with social obligations and haircuts and such encumberances. It was sad to note how civilization had once more got them hooked and subjugated.

The Doctor and I had only a day and a half in this place, and did not investigate the region very enthusiastically. I took a walk in a southwesterly direction, out to the edge of things, and photographed Mr. Scott's bluff - which is across the river and several miles away from the town. Limited areas in this region are given over to "bad lands" similar in character to those we had studied in Sioux County.

Dr. Wolcott had gone in the other direction, down the river, and when he returned he "had one" to tell on himself.

He was collecting insects in a field of alfalfa, using his net, when a farmer came up to see what it was all about. The Doctor replied to his questions, to the effect that he was collecting insects to see what kinds there were on the alfalfa. The farmer offered no comment until he had watched proceedings for some time; but he remarked, as he turned away at last, "Well, that's the damnest thing I ever saw a man do!"

We got away from Scotts Bluff on the morning of August 9th. Reaching Bridgeport the Doctor and I parted company with Pool and Williams, who went to Colorado for a vacation - fancy that, now! - while we went north for further investigations in Sioux County.

This was the end of the travelogue notes although Dr. Wolcott and Shoemaker went to Sioux County from August 10-29, 1911 to continue their observations.

Shoemaker's records of non-scientific events in the journal for each region visited present a broader view of western Nebraska in the early twentieth century. More than seventy years later, the personal efforts and recorded observations constitute an important documentary resource. His writings include more than notes on the favorite topic of bugs but document other outdoor heritage features of Nebraska. Frank H. Shoemaker, the "beetle sleuth" and "Sunday naturalist" was instrumental in researching, for personal satisfaction and scientific knowledge, the natural landscape of a developing state.

NOTES

1. "Trees for the Great Plains, Charles E. Bessey and Forestry," Journal of Forest History, 23 (January 1979): 1.

2. Bruner, Wolcott, and Swenk published A Preliminary Review of the Birds of Nebraska in 1904.

3. Frank H. Shoemaker memo of photographic experience, 21 March 1940.

4. Frank H. Shoemaker letter to H.P. Peterson, 2 September 1901. This material is included in the collection of material maintained at Love Library Archives, the University of Nebraska at Lincoln.

5. These sites are currently known as Carter Lake and Fontenelle Forest, respectively.

6. Shoemaker wrote personal journeys that were kept in a printed form. They gave details of the observations made on a particular day. These records are also included in the archives collection.

7. Sunday World-Herald, 27 June 1909. The two-thirds page article included photographs of the work Shoemaker was doing with tiger beetles.

8. Ibid.

9. Ibid.

10. Shoemaker memo of photographic experience.

11. Ibid.

12. Sunday State Journal, 10 September 1911.

13. Ibid.