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**An  
Oral History Interview  
with  
Russell Grater**

**1995**

#3531.3849

# Photographs

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## Acknowledgments

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*This is Dennis McBride talking to Russell and Evelyn Grater at their home at 1102 Angelle Way in Boulder City, Nevada. Today is Thursday, March 15, 1985. I'm going to be talking with Mr. Grater about his relationship to the Grater family and his association with the National Park Service before he came to Boulder City, and then after he came to Boulder City and the Lake Mead National Recreation Area.*

*First, Mr. Grater, could you tell me when you were born, and where, and a little bit about your family?*

*Birth date is November 16, 1907. Born in Indiana, near Indiana Dunes. Grew up there.*

*Did you have brothers and sisters?*

**Boulder City Library**  
**Oral History Project Interview**  
 with  
**Russell Grater**

**conducted by**  
**Dennis McBride**  
**March 15 and 28, 1995**

*This is Dennis McBride talking with Mr. Russell Grater at his home at 1102 Arapaho Way in Boulder City, Nevada. Today is Thursday, March 15, 1995. I'm going to be talking with Mr. Grater about his educational background and his association with the National Park Service before he came to Boulder City, and then after he came to Boulder City and the Lake Mead National Recreation Area.*

*First, Mr. Grater, could you tell me when you were born, and where, and a little bit about your family?*

*Birth date is November 16, 1907. Born in Indiana on an Indiana farm. Grew up there.*

*Did you have brothers and sisters?*

I had three brothers and one sister. They're all gone except my sister now. My oldest brother was quite a basketball player. Coached basketball in high schools for years. My next brother was quite a basketball player, and they tried to teach me how to play basketball when I was kid, so I learned enough that I played high school, and some in college. But they're all dead. One brother was killed while I was in Yosemite.<sup>1</sup> He was working as a flying instructor for the air force down in Texas. He had the misfortune of having a young pilot up taking a lesson on his own, flying his own [plane]. He dove his plane and flew right into the tail assembly of my brother's plane. My brother escaped by parachute, but it opened too late. So, [I] lost him. My oldest brother just died of heart complications.<sup>2</sup> My youngest brother died of bone cancer they call it now.<sup>3</sup> My sister is now 92.<sup>4</sup> She lives in Indiana. I talked to her and told her she better keep going, I'm hot on her trail, I'll catch her up if she doesn't hurry up. I'll be 88 next birthday.

*Your dad was a farmer?*

Yes. We had about a hundred-acre farm not far from the town of Lebanon, Indiana.<sup>5</sup> Close enough that I went to school in Lebanon, high school. Used to be a problem getting there because you could either walk in—they didn't have buses or anything like that. You could either walk in or you could ride an inter-urban [train] which you could get on about two miles away [from our farm]. That'd take you into town.

*How far was it into town from your farm?*

Five miles.

*So you walked five miles?*

Sometimes. Yeah. But I'd ride that inter-urban if I could.

But in case I needed to, I'd just walk straight in. There was a railroad track that ran right through our farm led you right straight into town. Sometimes it was just as easy to walk that five miles to the high school where I went to school, or walk two-and-a-half miles over to get the inter-urban the rest of the way into town. I got my exercise, all right.

*Later on you became involved in the Park Service as a naturalist. Did you have this interest that early in your life, as a child or in high school?*

Well, I can tell you one or two things that might be of interest. My mother made a naturalist out of me unwittingly. She loved birds and she loved to be out of doors. She liked birds to the point where she'd actually get out on our back porch and whistle and a cardinal would come there and land on the railing and whistle. That intrigued me no end, and I got interested in that when I was just a kid. She'd promote that interest by going to the library in Lebanon, and anything she could find on ... natural history and the out of doors, she'd bring out there. I learned to read those things before I went to school. I could read very fluently long before I went to school. So I grew up knowing pretty much all about the wildlife in our area. We had a big woods area, virgin timber, never been cut. Lots of birds, lot of mammals, things like that, so I learned a lot from there.

Then that interest just stuck with me all through school, and when I got to college, I took a lot of biology. I graduated with my degree in psychology, but I had more units in biology than I did in psychology.

*Why did you do a major in psychology rather than biology, then?*

Because I expected to be a teacher, and a teacher ought to know something about people.

*What kind of teacher did you want to be?*

I was going to teach in high school. I was going to teach all the subjects I would take a lot of in college. I had all this biology, and I had quite a lot of math, English. The upshot was that that's what I was going to do and it worked out very beautifully. I had a good teacher in psychology, an old-timer, much loved as a teacher. This was at Wabash College, incidentally, in Crawfordsville,<sup>6</sup> Indiana, boy's college. Well, in any event, I would have stayed in teaching—I was a graduating senior in 1930, and I had a job all laid out to teach and coach basketball. I used to play a lot of basketball—you couldn't grow up in Indiana without it. So this psychology professor called me in and he wanted to pick seven psychology students, send them down to a newly-formed state park, the



**Top Photograph**

**standing, l-r:** Glen Tarman [husband to Lura Grater]; Russell Grater; Lizzie Grater [mother]; Harley Grater; Byron Grater; and John Grater

**kneeling, l-r:** Lura Grater Tarman; Jim Tarman; and Pat Tarman, ca. 1932

*[photo courtesy of Russell Grater]*

**Bottom Photograph**

Russell Grater at Sequoia National Forest, ca. 1968

*[photo courtesy of Russell Grater]*



first one in Indiana, to see what a graduating senior would do with his time if he went to a place like that.<sup>7</sup>

So, I went down there. They hadn't begun to develop much about it, [there was just] a place to stay overnight, that sort of thing. No lodge or anything like that, really, yet. I did my work that I needed to turn in, any thesis-type of thing, and I'd then spend a little time just seeing the region. Beautiful country, beautiful region, marvelous forest, stream running through there, big stream. I liked that very much, it just fit right in with all my interests. And the last day I was there, I thought I'd take a trip on a new trail that led around quite a bit through that area. I went through that area, and on that trail there was a small waterfall, not much higher than this ceiling right here. It was in a beautiful setting. I sat down on a rock to look out. I was just looking at this thing and suddenly the thought just came to me—and don't ask me where it came from, it was just like a voice said to me, "Russ, what do you want to teach?" Of course, I had a teaching job offered and a coaching job offered, and I thought, "That's a good question. What do I want to teach? What's wrong with this that I'm looking at?"

So I went back and got in touch with the newly-selected director of the state parks of Indiana, the state parks system, and asked him, "How about when I get out, how about a job out there?" It was a beautiful park, wasn't developed yet or anything. And he said, "Mr. Grater, I'll you what I'll do. I'll give you a job out there if you'll do one thing." I wondered what that thing was. He said, "We're starting to develop this park and other parks in this state, patterned after the National Park Service, and the way they handle their parks and how they work them and so forth. If you'll go to one of those national park areas, and get a job for the summer just to get some idea of how they run these things, find out what the national park is about, come back and I'll give you that job."

Well, that's all I needed to know. The next thing I needed to know [was] how to get a job in the National Park Service. A graduating senior, I knew of only three national parks: Yellowstone,<sup>8</sup> Yosemite,<sup>9</sup> Grand Canyon.<sup>10</sup> So I wrote to the director of national parks in Washington and asked for the address of superintendents of the national parks. When I got [my answer] I found out there were 24 areas that the national Park Service administered, so I wrote to all these superintendents, told them what I wanted to do with the information, I wanted the experience, I was interested in parks, and so forth. This was in 1930, the Depression days had hit dead-on. They all wrote beautiful letters back that they were interested, but couldn't help. No money.

But I got a letter from the superintendent at Yosemite. He said, "We don't have anything we can offer you, but we do have a training center here, newly-established, called the Yosemite School of Field Natural History. If you're interested, you make application to that, and if you're selected, you'll spend the summer in Yosemite taking training in how to be a naturalist."

So I made application and lo and behold, I got it. They took 21 students from all over the country to come in there and take that training. My problem, of course, was to get out there. Heading out was not as simple as it sounded. My dad had an old Model T Ford that had seen better days. My uncle had one, the same model, that had also seen better days. So I put those two together and had a good-running Model T. Took off with a lot of canned goods with my mother's help, got to Yosemite. In those days, you know, you worked for a dollar a day and your board on a farm. I managed in off-time to make up a little, pay for gasoline, stop along the way as you go and see if you can't get a day's job somewhere.

I got to Yosemite, floored by what I saw. I'd never visualized what Yosemite looked like. Those water falls and that canyon were something. So I stayed there all summer, getting my training there under people who knew what they were doing.

But then I had to go back at the end of that summer, back to Indiana and pick up a job working on a farm. I figured that this [the national park] was more what I was interested in than the state park, so I didn't apply at the state park. I'm sure I could've have gotten in [if I had].

Then I figured the best thing to do to get a job in the National Park Service, which is essential, was to visit the superintendents, not to write them. A personal application's worth a heck of a lot more than a written [one]. I was in Yosemite in the Field School in 1931. I bought a little old car and took off to make a loop of the [national] parks: Grand Canyon, Sequoia,<sup>11</sup> up to Yosemite where I knew everybody. It was an early spring—I wanted to get in there as early as possible, might run into something. Yosemite was getting in the snowy season yet in the spring, early spring. I went up to Mt. Lassen.<sup>12</sup> Funny thing happened there. I went in to see the superintendent and he must have [had] a bad night or something. He listened to me for a little while, very short little while, as a matter of fact, then he informed me that he was busy. It made me mad. You know, when you're mad you say things you have no business saying. I told him, just like some kid making a boast, which I was, obviously. I told him I would be in

the Park Service after he was out! I'd have gone straight back to Indiana at that time to get there in time for the spring jobs, but something told me I had to go on anyhow. Two reasons. I'd met this lady<sup>13</sup> when I was a junior in college. She was working in a dime store and she'd promised me that on this trip around she'd try to send a few dollars ... ahead of me to help pay for the trip. So I thought, OK.

I went on up to Crater Lake.<sup>14</sup> Twenty feet of snow. I had to camp out because it was too early in the spring. Superintendent was gone, I couldn't see him. Park naturalist was gone back to Missouri somewhere. So I was a little bit discouraged in a way. I went on to Mt. Rainier,<sup>15</sup> went in to see the superintendent. He was an ex-major in the army, so I expected anything then. But on the contrary, he was a very congenial sort of man and encouraged me and he said, "Trouble is, Mr. Grater, I don't have anything for you and I can sympathize with your efforts. But you know what? I can go down to the University of Washington down here and get some of these football players to fill out my uniform." Of course, I'm not very big. Again, [I] made a boast I had no business making. I asked him, "Have you ever hired anybody for what he might have under his hat?" He thought that was funny as heck. Well, it wasn't too funny to me. I would have left, but I went down to the inn to see if there was any mail from [Evelyn] and there was. And just about shortly after I got in there I asked them if there was a possibility of a job for two or three days to get some money to head back East. About that time the dining room door flew open and a man came out of there yelling bloody murder and waving a butcher knife. Everybody scattered. The clerk I was talking to said, "I know what the trouble with him is. He's the cook." [The cook] was yelling in Italian, which I couldn't understand. And [the clerk] said [the cook] said something about a bear. I knew something about bears. They'd taught us in the field school there in Yosemite about bears. So I took out after him and he went just exactly where I thought he'd go. He went to a cooling room where he had pies and cakes and things like that. There was a bear there having a ball. I chased this bear out and he took off. This cook then, oh, was he pleased as punch at that! Very grateful, and what could he do for me?

At that time I only had some loose change in my pocket and I pulled it out and asked, "What can you feed me for thirty-eight cents?" He fixed me up with pork and beans enough that'd last an army, I think. So I decided to stay over, might as well see the park naturalist. That was the type of thing I was interested in. Went

to see him, man by the name of Frank Brockman. Brock had been at Yosemite. He told me he was tickled to death to see me there, but he said, "I can't give you a job this year, but I can give you a job next year for sure. You're the first one that's ever applied from the field school down there. Look around, get acquainted with this place because you'll need to know."

Well, this was wonderful, 'cause, you see, I'd achieved a job—had to wait a year to get it—but I'd achieved what I'd started out to achieve. So I thought well, I'm just lucky, I might just as well go over to Glacier National Park<sup>16</sup> on my way East, it's right across the country there, see what they have, what they could tell me. They were just as good, that they didn't have anything then, but they'd keep me in mind. So I thought, well, I might as well push it, so I went down to Yellowstone.

And Yellowstone were just as nice. They said, "When you get back to Indiana, be prepared to return because we always lose a uniformed man or two before the season hardly gets started. If you want a job here, you can have it. Just come back." I thought, Gee whiz!

So I went down to Rocky Mountain National Park<sup>17</sup> to see the park naturalist there. And he couldn't understand why I would want a job in those colder parks. He'd put me on earlier than any of the rest of them could, and that would mean quite a bit, a month or so.

So I got ready to go back to Indiana, started to get in my car, and he came out of the office yelling, waving a sheet of paper. I didn't know what in the heck I'd forgotten. What it was was a telegram from Glacier National Park saying they had a job if I wanted to come back and get it. So I went back to Glacier National Park, spent the summer at Two Medicine as a naturalist on my own—they didn't have enough naturalists to go around anyhow. So I was in charge of the naturalist program, interpretive program [it's] now called at Two Medicine. In charge of my own talks, hikes, things like that. So I had that experience.

I went back to Indiana, got my job for the winter. [Evelyn] and I decided that the following year, 1933, she'd like to go with me up to Glacier. I'd promised them I'd return to Glacier.

So in the spring of the year we got married. I wanted her to see where I got my training, so we went over first to Grand Canyon, then up to Yosemite. And there things happened which we hadn't anticipated. The park naturalist who I'd worked under in this training program called me one morning and said, "Russ, I'm sorry to say this but something happened in Washington you didn't know

about The Economy has not gone into effect." The Economy has, of course, been a great down here, but, as you know, the fact is, we just got a telegram from your manager saying your job was not because they had a man in it.

So it was kind of interesting, newly married, not a dime, and he had a long way from home.

So we got along as best we could for two or three days, and then this man, out of the blue, the park naturalist, called me in and said, "Look, there's a lady here from Hollywood. She wants a private guide and we can't furnish a private guide. Can you help her?"



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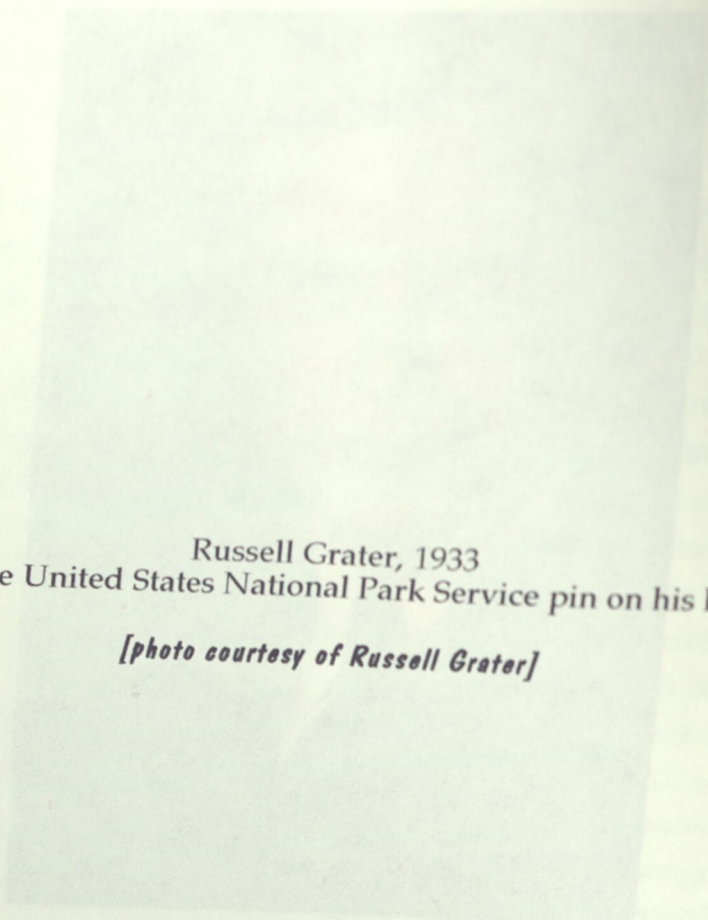
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Russell Grater, 1933  
[note the United States National Park Service pin on his lapel]

*[photo courtesy of Russell Grater]*

about. The Economy Act has gone into effect." The Economy Act,<sup>18</sup> of course, was to cut down here, here, and there. He said, "We just got a telegram from Glacier saying your job doesn't exist because they had to cut it out."

So it was kind of interesting: newly-married, not a dime, and no job, and a long way from home.

So we got along as best we could for two or three days, and then this man, Burt Harwell, the park naturalist, called me in and said, "Russ, there's a lady come in here from Hollywood. She wants a private guide and we can't furnish a private guide. Can't do that. So I told her we have a fellow here who knows this country around here. So if you want to take that at five dollars a day—that was wages then, and *then* some—why, she'll be here tomorrow." I got a job showing 'em around.

Then another thing that happened. Harwell called me [to say] I had a letter from Stanford. They wanted someone to collect frog eggs, Yellow-Legged Frog eggs, for their laboratory work. Five dollars a day. So I hiked out above Yosemite Falls, up in that country, where I knew there was some low-lying areas, to get frog eggs. Take off your shoes and wade into that icy water and look for frog eggs, 'cause that's when they laid them, in the early spring. So we got that sent out.

Then about the time that we thought we'd had it, Harvard University wrote in and they wanted somebody to collect vermileo. You know what a vermileo is? It means worm lion. *Verm* is worm. *Leo* is lion. Lion worm, if you want to call him that. They make these cone-shaped holes in the ground. So I collected those and sent those in and I got paid for that.

Then one morning we came back and the chief ranger was there at our tent. He'd been quite interested in what we were trying to do and he said, "Russ, I know that everything isn't turning out as well as you thought it would, but we have a man that will not be on the job tomorrow. He's quitting. If you'd like to be a ranger for the summer and help run the upper end of the control roads out of Yosemite Valley to Tuolumne Meadows and on up above, be up there at that station tomorrow morning." We packed that night and went up. So for the rest of the summer we were in that control station. Traffic moved up the grade on the even hour, down the grade on the odd hour. You had to control them. At the top of that grade [Evelyn] went to work helping out on a nature exhibit. These people had to stay there for awhile, we thought we might as well just cash in on some of the training I got.

So that was the summer. We went back to Indiana and I got a letter from the superintendent at Grand Canyon. He said, "I remember two years ago you were in here looking for a job. Now I have one." He told us when he could put us on, and that [it] would be early. I had to go out in the very early spring—[better] climactic conditions farther south than going clear up to Yosemite or up to Glacier. It was then to Grand Canyon.

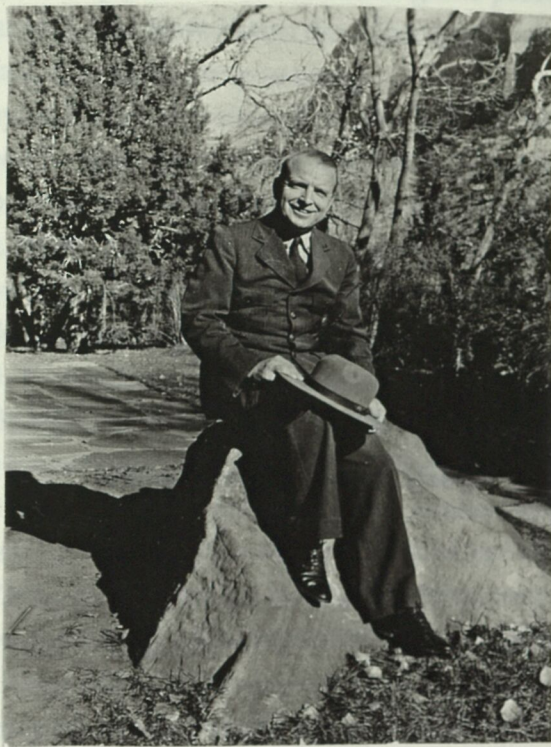
The park naturalist I got to know [there] so very well, his name was McKee. Edwin McKee, a geologist, crackerjack at that. Had his doctorate. He was the authority on the Grand Canyon geology. My job there, then, was to take people coming out to Yavapai,<sup>19</sup> which is the geologic observation point out there, give them talks on the origin of the canyon, the geologic background, and so forth, of the Grand Canyon. That was great.

Then about the time I thought *that* was going to disappear, the park naturalist was sent to Washington for several weeks. We lived in his place and ran the interpretive program there for awhile, naturalist's program.

To make a long story short, he'd have to be back sometime in late winter, so that let me out of a job. Then I got a telegram from the director's office in Washington saying, "How about changing types of position for the summer? We have an opening as a field biologist in the Wildlife Division of the National Park Service. How'd you like to take that, stationed at Grand Canyon, and work that?" That was a gift. Fortunately, it so happened I was acquainted with the man who was the head of it, George Wright.<sup>20</sup> So we stayed at Grand Canyon. We'd live on the south rim in the winter, go to the north rim in the summer. I had the job on the north rim of primarily trying to get a pretty good idea as to the carrying capacity of the north rim—we were getting too many deer over there. They were eating up the country, literally. But you see, their natural controls had been killed off in the forest around there. Mountain lions, coyotes, bobcats. And then to add to the problem a bit, there was a lot of grazing through that country, and the food the deer ate, also the cattle liked, too. The deer were running out of food. I'd go into an aspen grove and see young aspens starting to grow up, eaten off right against the ground. And the other leaves of the aspens browsed off as high as the deer could stand on its hind legs and reach. So I had to find out how many deer were on that rim and what we could help do about it. I run census counts, tried to figure out how much food there was.

In case you're interested, you take a meter chain with you out in the field, measure out where you want to make an examination, stick the chain down and





**Top Photograph**

Russell Grater at Grand Canyon, ca. 1934 - 1935

*[photo courtesy of Russell Grater]*

**Bottom Photograph**

Russell Grater at Zion National Park, ca. 1942 - 1943

*[photo courtesy of Russell Grater]*

make a metered circle. Inside, you cut every plant right down to about so high and put that in a bag. Then you take the bag [of plants] and air-dry it so there's no weight in there to speak of from moisture. Then you look at these plants under the microscope so you can tell exactly what species you're dealing with, every bit of them. You wind up by saying that this species and this species and this species the deer feed on, and this is abundant, this is practically gone. You run several of those out across country about every half mile. The upshot of it was, through studies like that, they figured they had to take off several thousand head of deer. So in the fall, I would go to the hunting camps—they were in the national forests, just adjacent to us. Hunters had to go to those camps with permits to hunt forest area. You could get two deer, one of them had to be a doe. That'd cut down the population in a hurry. They couldn't dress them out in the fields—they had to bring them into camp. So when they came into camp, my job then was to check their stomach contents, collect the stomach contents just to make sure what they were eating. Air-dry all that, check it against what you're finding out, then apply a chart the University of Iowa had worked up on deer. Characterized the food requirements. You could get a pretty good figure then how much food you had and how many deer there were. So I would attend all these things in the fall, during hunting season.

From Grand Canyon I was transferred to the Denver office of the Wildlife Division. This proved to be a good move and soon I was offered my first full time permanent job as Junior Naturalist at the Lake Mead National Recreation Area in March 1938. While here I got a notice from the Director's office that Yale was giving out fellowships. If I was interested, I should apply. This I did and was selected. So we packed up and went to New Haven, Connecticut. The scholarship was for 1939 - 1940. It was there I took some valuable courses in field geology under Dr. Chester Longwell,<sup>21</sup> a man who carried on extensive studies in the region around the Hoover Dam site. When I finished at Yale, I thought I would go by Washington, then to my home in Indiana while enroute [back] to Lake Mead. While in Washington, the Director's office told me about a position open in Grand Teton.<sup>22</sup> "Why don't you go by Grand Teton, see all about it? If this develops, you'll have the job as park naturalist at Grand Teton." They were just in setting up a staff. They didn't really have a staff. It was practically new at that time. It'd been developed, lands bought out and given to the government, and so forth.

Well, at any event, we went through there, and we rode back then prepared to go to Grand Teton. Fortunately, we didn't buy better clothes. Just about two weeks before we were scheduled to go to Teton, I got a wire from the director's office saying, "Change your plans. You're going to go in as a naturalist in Zion National Park."<sup>23</sup> This would be a permanent job, my first permanent job. So we went there in the fall of 1940. We were there when the war broke out.

Then I was asked why not go to [Yosemite] as Assistant Naturalist, they needed help there. Service men were coming in there needing rehab time. So we went to Yosemite. There's where the training that I got in psychology came in. You're dealing with people coming in there—especially submarine people. That canyon worried them to death, might fall in on them. So you take 'em on a trip up to Glacier Point where they can look down in all this and you could tell them the story of that big canyon. Its great resistance, even glaciers couldn't move it. And so on, you see.

Then about the time that I thought maybe this was going to [last] awhile I got a notice that Air Service Command wondered if I wouldn't transfer to them in Sacramento, McClellan Field, take over the running of a training center there for supervisors. I didn't know anything about their supervisors, but it sounded good. War effort, in a sense. So we went there.

I was sent back to Tennessee to do some close-up work on the course they wanted me to teach. A course that was designed by some forty universities and business houses, about what a supervisor should know and how he should act and so forth. I came back, I had supervisors on the field then to train. We were losing supervisors because they couldn't get along with their staffs and their new employees. New employees didn't know the job, and the supervisors didn't, either. And this was the place where all the stuff dealing with the South Pacific war was coming in. Bombers for rehabilitation, fighter planes, all sorts of things. They had assembly lines that even Ford would have loved. They'd set a fighter plane in one end all shot up a bit, came out the other end all new parts, ready to go again. Well, that was interesting.

Then one day the commanding officer there on the post—it was a field post—came in and said, "Russ, what were you doing before you got into this?" I told him I was with the National Park Service.

"Would you like to go back?"

I told him, "I'd love to go back."

He said, "Well, I'll tell you. You write to the director, and if there's a job available, you accept it."

I said, "Look, I promised I would stay here on this training job doing all this kind of work for a long time to come yet. They need it."

He said, "Why don't you let me handle that?"

Well, he was a colonel and I didn't argue with him too much. So I got a notice from Washington that, yes, there was a vacancy in Rocky Mountain National Park. Report there on such-and-such a date if you can make it. So I took this in and gave it to this colonel and I said, "Now what?"

And he said, "Leave it to me."

Took him just 48 hours to get me released, and I'd had to take special training and I wasn't barred from everything on that field, but mostly, because I needed to know the supervisors.

So we went to Rocky Mountain National Park.

Before we left I asked this colonel, I felt bad leaving because the war was going on. I always remember him saying, "It won't last much longer." And I asked him how he knew, and he said, "I *know*."

We were at Rocky Mountain then when Hiroshima was blown up.<sup>24</sup> So I knew what he was talking about. Then immediately we got a notice from the director's office that the war was coming to a rapid close and everything. "We'd like to send you back where you were once before—to Zion." As park naturalist this time, not as an assistant. So we went back to Zion.

I'd been after the Park Service [San Francisco Regional Office] to do better training [of] their supervisors and their staffs, so I got a notice from the director saying, "Hey, we have just the job for you. We want you to go to Harper's Ferry, West Virginia and establish a training center there on how you do a job as a naturalist, running a naturalist program. What does the supervisor need to know [about] these things, and so on." In the meantime, I'd been giving this supervisory course through the parks, three or four days here, three or four days there.

So back to Harper's Ferry we went. I had the job of setting up a training program. They'd never done that before. That was a challenge. So I set this up on the basis of things that I'd experienced and what I knew others had experienced in trying to run a naturalist program. Then they gave me the privilege there of selecting the first class. I selected seventeen men I knew about in the field. I wanted them to come in here, take a look at this program that I'd

set up. I set it up first and all the details and said to them, "Come in here now and let's give this thing a practical tryout. We'll establish a hypothetical park and program and so forth." We had everything in the vicinity we could work on. So they came in, we run that program, couple of years, three years on that. One day the superintendent of Sequoia, whom I'd known through the years, got in touch. He was in Washington.

He said, "Russ, why don't you come to Sequoia. We have a vacancy."

So I told him I had a job near Harper's Ferry, and he said, "Well, we could use you." So I suppose about a month later he was back in Washington and he called me and said, "Russ, this job's still open."

Sequoia was the park I'd always wanted to go to. The big trees, the Sierras. So I asked the director whether I should take it, [and he said] why not? And he said, "Do you know of anybody in the field who could come in and run this thing?"

I told him I knew half a dozen guys could run this program I was trying to run there.

OK. We go to Sequoia. I was there then until 1969. In 1969 I retired from the National Park Service. Thirty-three years of it. Then there was a choice during that time of where to retire to. We'd been here [southern Nevada], liked this country, we knew the people, we knew the countryside, and we knew things pretty well. Close if you wanted to go to Zion or Grand Canyon or Bryce Canyon<sup>25</sup> or somewhere. So I came in here.

Then when I retired from Sequoia, we decided we'd come back here, retire here, because we knew people. So when I came back here it was a matter of first, seeing how they run the [naturalist] program, what they'd done to it, what they've added to it, how they've improved it, and so forth.<sup>26</sup> So while I've been here, I got interested in seeing if I could fill one or two of the knowledge gaps, something on wildlife, something on plant life, things like that. People come in, ask you what's the name of the bird, what's the name of the flower, what's the name of the animal, what kind of snake do they have here? That's why I produced two books here which you're probably familiar with.<sup>27</sup> I produced this one on the interpretive program and the training at Harper's Ferry as a book.<sup>28</sup>

So I've been working on that off and on, kind of keeping my interests alive and all that goes on. Bird studies.

*You've given lectures and programs, too, haven't you?*

Yes. *we had a good piece of luck. There was a young man listening to all this problem came up and said, "These people would like to let you through but they*  
*Do you do consulting work with the Park Service even now?* He said, "Why don't you

No. I did after I retired. With the idea of looking at sites that might be of national importance, make national landmark [status]. So I visited a number of areas that they wanted me to check up on, and check up on landmark sites in California and Utah and Arizona and Nevada and part of Colorado. Which was fascinating. I had the pleasure here just a short time ago of seeing one of the areas that I worked on, that I highly recommended, that's now passed by Congress, and that's the Mojave Desert.<sup>29</sup> When I saw all that I thought, what the heck? Here's an area that should be taken care of. And with the way of desert traffic anymore, getting in a car and just go or a motorcycle and just go, that was an open invitation down there to mark it with trails and everything else.

*I'd like to do then is concentrate a little bit on those years you were down here at Lake Mead, 1936 tell about when?*  
*It was controversial getting that established, too, wasn't it?*

I came in here in 1936 when the lake was just coming up pretty fair. There was  
 Yeah. But it's a good desert area, further south than this one. *here. I could find*  
 Boy, I had another experience of interest to me, going back to the Grand Canyon days when I was with the Wildlife Division. They wanted me to join a team that was going down into southern Arizona to look at a place where organ pipe cactus grew.<sup>30</sup> To see what the mammal situation there would be there. So I went along with this team. Right in the middle of summer. July. We didn't camp out down there, I can tell you. On one day there, the leader of our team out of Washington, nice guy, got himself lost trying to get in on any old cow path that would lead out of that country. We ended up at Quitobaquito Spring, a natural spring right there in the desert, vegetation, kind of place where they have a very unique species of fish. Looking out on that there was an Indian lived there in a little shack. We asked him where Sonoyta, Mexico was, because when we were in Mexico I saw a marker up on a mountainside. He said that if you go down this way and head over on a road this way, we'd land there. So we went there, found out here we had two car loads of people in government cars in Old Mexico without a permit. Trouble was how to get out. The nearest telegraph station where we could get in touch with an American Consulate or anything was forty miles across country.

Then we had a good piece of luck. There was a young man listening to all this problem came up and said, "These people would like to let you through but they don't know how to do it." At the border station there. He said, "Why don't you invite those two officials in here and I'll give them some good Mexican beer." So we said, fine. Pretty soon he came out and said, "One more bottle'll do it." He spoke English very fluently, had been going to the University of Arizona, out of Mexico, literally.

Pretty soon he came out with a sheet of paper and said, "Take this down to the entrance station, border station, give it to the guards down there. Don't talk. Just give it to them and drive on."

We never knew what was on it! We always referred to that as liquid diplomacy. It carried the day. Anyhow, it was one of those screwy things happened.

*What I'd like to do then is concentrate a little bit on those years you were down here at Lake Mead, 1938 till about when?*

I came in here in 1938 when the lake was just coming up pretty fair. There was a time when I looked to see what kind of wildlife was around here. I could find anything on geology.

*Let's talk about the Civilian Conservation Corps boys that were here. They came to Boulder City in 1935 and had what they called the Twin Camps here.<sup>31</sup> And they had quite a lot of work projects going on in this area. Can you tell me if you remember what was the relationship between the National Park Service and the Civilian Conservation Corps in the Lake Mead area?*

We were always interested in what they were doing as to how it affected the park area from the naturalist standpoint, the wildlife standpoint, and the natural history standpoint. What they often could tell us in their work, what they were finding out, what they would see. Some of these boys got quite interested in what we were doing, interested enough they'd keep their eyes open and report to me, especially, anything they saw in the natural history field—certain birds, certain animals they might run into. Where they found them, and so forth. They were a good source of on-site information for certain things like that.



*Did they ever run across anything very unusual that you remember, or that you found remarkable at the time?*

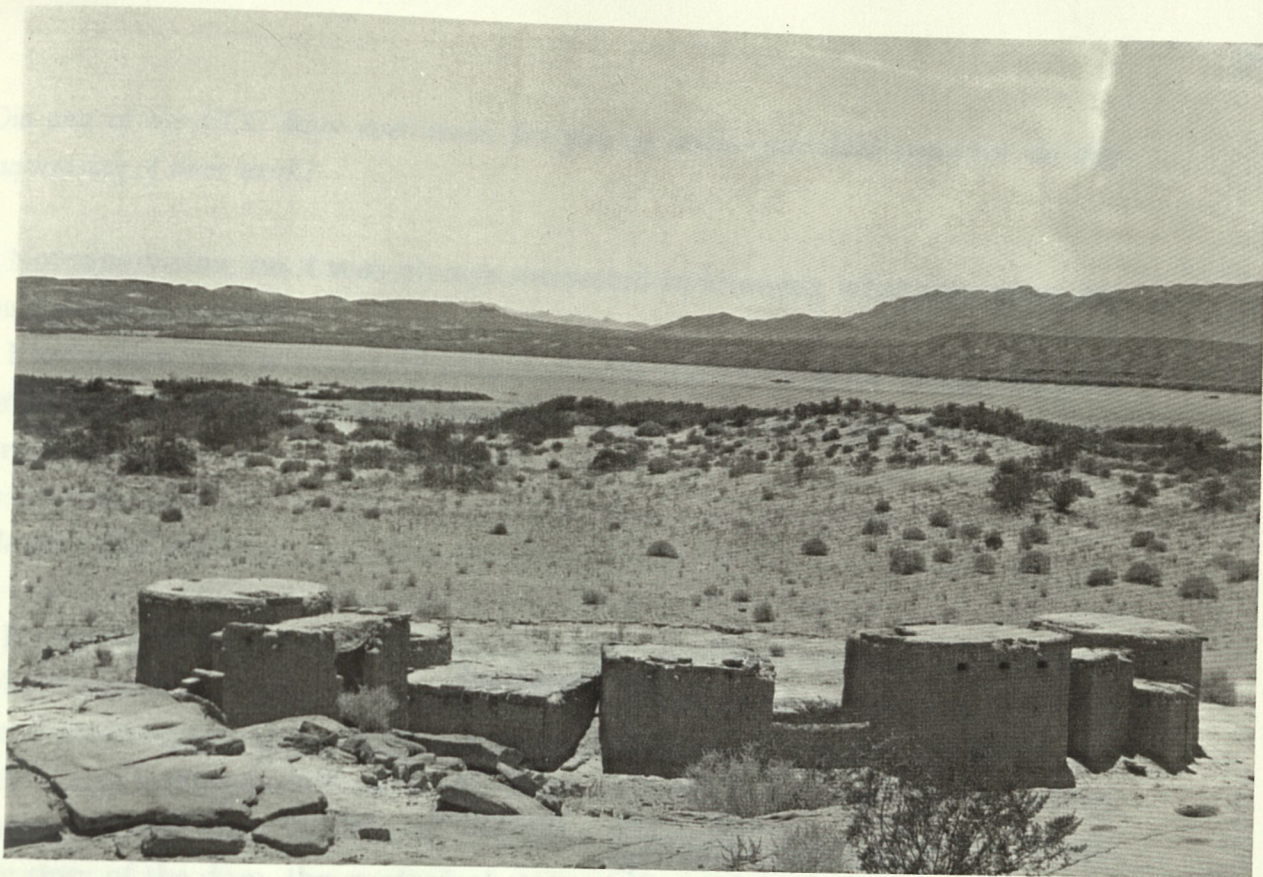
Well, not that I found it remarkable in one sense. They had put up the Lost City Museum.<sup>32</sup> I got interested in that because I was photographing the original Lost City.<sup>33</sup> They had reconstructed the original Lost City on the site, had restored it. And when the lake was coming up in 1938, on my second or third visit in there that spring, the lake was rising rapidly. And I could see water coming right up that valley and I realized that the rate at which it was coming up it would hit that reconstructed site. So the day before I figured that [the water] had to be there, I went in and photographed that thing because I just had that feeling. You see, that was made up of adobe, branches, and so forth. A typical desert structure. When I went out there the next morning most of it had collapsed. The water would get up there and take out all that adobe footing, and that was it.

So I was interested in that and very much interested in what they were going to put into this Lost City Museum in Overton because I actually saw what it looked like originally, and had occasion to discuss a few things with them. So I was interested there.

And I was interested—didn't see them do it—but they built that stone cabin in the Valley of Fire.<sup>34</sup> And several things they were doing I was interested in. Rogers Spring.<sup>35</sup> They had done work in Rogers Spring and I was interested because there you found, really, a prehistoric species of fish and I wanted to preserve that fish. I could see that [if they] made Rogers Spring readily accessible, with visitors going right by it almost, somebody would be putting something in there they had no business putting in there. And eventually they did. Eventually one or two people didn't know what to do with their pet alligators and dumped 'em in there.

*I remember even when I was a child going out there. There were tropical fish—guppies and black mollies—that obviously weren't indigenous.*

No, they weren't. [And the prehistoric fish in Rogers Spring] were from the White River<sup>36</sup> drainage. You didn't find them any place else.



### **Top Photograph**

Lost City reconstruction with Lake Mead rising in the background, 1938. On April 24, 1926 the *Pageant Pueblo Grande* was presented within these reconstructed buildings.

*[photo courtesy of Dennis McBride]*

### **Bottom Photograph**

Lake Mead reaches the foundations of the Lost City reconstruction, 1939.

*[photo courtesy of Dennis McBride]*

*Did any of the CCC boys ever work for you or with you? Did you ever do any supervising of their work?*

Not supervision, no. I was always interested in knowing what was going on, but just for information.

I had a man who was closely affiliated with the CCCs. John Burns. We gave programs in the [Boulder] theater building down here, and John was my projectionist.

*He was a CCC boy?*

He was hired by the CCC [in] pretty much an official capacity. I don't know what his position was, but it wasn't just a normal run-of-the-mill job. He was a good projectionist. He was always interested in what I was trying to do and what I was trying to tell these people. We run programs there every week telling them about the Lake Mead area. Tell them where they could go to find things, the story of the dam, the geological story of the region, show them pictures of wildlife, plant life, this kind of stuff. I shot a lot of pictures here in color. I have in there now, not all of them here, a little over 7,000 kodachromes in there. They came in handy when I wanted to publish this flower book and when I wanted to publish this reptile book.

I have to point out that my wife had her doubts about my reptile book. I wanted pictures of reptiles up close, of course. I'd catch a reptile and put it in a paper bag and stick it in the refrigerator, let it get thoroughly cold. Then take him out and set him in the kind of pose you want him and the kind of surroundings you want him, and he'll sit there. But [my wife] felt she should draw a line when a bag that I put in there buzzed. But that was the easiest way to get a good picture of a rattlesnake.

*Can you tell me about some of the archeological and paleontological projects that the CCC boys were involved in up at Pierce's Ferry<sup>37</sup> and down at Willow Beach?<sup>38</sup>*

At Pierce's Ferry they were involved with Rampart Cave up there. That's paleontology there. Although the Muav Caves right down below along the river were occupied off and on by Indians, used by Indians. Of course, I was interested because they knew something about those places.

But their big job at Pierce's Ferry was getting all the lumber and logs out of the river.

*Was there a problem with lumber and logs coming down?*<sup>39</sup>

Oh, you betcha. The river was coming down, you see, and it was floating a lot of stuff into the lake and it became a boat hazard up that way. And so [the CCC boys] would go out and bring those in and burn 'em. And so I was always interested in that.

But they were telling me about those logs being silted a lot. I thought that was interesting. A fellow by the name of Ed Schenk, Park Service, he was a geologist. I was a naturalist working here. We got a little old boat, hauled it up to Pierce's Ferry and took off up the river. We wanted to see what was up there and I wanted to see more about the canyon, get acquainted with it, see if there were any mountain sheep in it, where they were located, and so forth. We got up to the waterfall up there [Columbine Falls, aka Emery Falls], just inside the canyon about five miles. We went in there to see about that and it was a hot day. I had brought with me equipment to test water, see what effect the water had on the fishes, if it was the same as where there was fresh water. We decided we'd find out across there. I lowered this collecting equipment—you lower it down and then open it, and it'll take a sample. I brought it up and it was full of mud. That was interesting. Hardly got out of sight. So we ran a course across there, carefully checking point by point where it was being run, and I run soundings on it with that equipment. All the way through you'd run into mud building up there, a delta. Literally a delta building up in there, except in the center where the current was.

When we came back, Ed Schenk, the geologist, came to some conclusions as to how long it would take that silt carrying so much down the river to start filling up Pierce's Ferry. We found that all the side canyons along there had mud backed up into [them]. As the water backed up [the canyons] silted over in there. So I know Ed turned a report in to the Park Service. The powers that be were planning on putting in development at Pierce's Ferry, a big development to go in there. You're going to have bathing, and you're going to have boating, and you're going to have all sorts of things. [Schenk] wouldn't give them any more than ten years before you wouldn't be able to run a boat in there. His report put a damper right immediately [on the development of Pierce's Ferry].

kind of roller-coaster things that weren't flat-bottomed, that was for sure. They  
 So they never did do a lot of development up in Pierce's Ferry.

And you could get into rough water on this lake when the winds came up. I  
 Just developed the campground for overnight camping, things like that. The  
 CCCs took care of all that.

Did the CCC build the little cabins up there? Their main interest, I think [in taking  
 along Park Service guides] was to get their boat pilots conversant with what they  
 That I can't say. I'm pretty sure they were responsible for them, but I can't just

say yes.  
 There was a landing strip up there, too, I believe.

Yes, up above the camp a ways, up there on the flats.

Do you remember the company, Grand Canyon-Boulder Dam Tours, Incorporated?<sup>40</sup>

Yes.

Did you ever deal very much with them? They ran a lot of tours up and down the river.

Yes. As a matter of fact, they came to us when I was new here.

What did they want?

They were going to run tours up in the lower Grand Canyon, and they asked if  
 some Park Service man could accompany them once in a while. Tell people what  
 they were seeing. So every time they sent a tour up there, one of the staff went  
 with them. Either I or Don Erskine... . Anyway, I went on several of those. I had  
 a chance there, with what I'd been able to see from my trip up [the canyon], plus  
 other trips that followed, to [tell the tourists] where things were found, what  
 canyons were good for hiking or getting into or of interest by supplying the  
 river with moisture, side streams and so forth. We'd go up on these tours.

They finally got a boat that traveled pretty well. When I started on these tours,  
 they had these boats that they used in San Diego for the harbor tours. These

will sink?

kind of roller-coaster things that weren't flat-bottomed, that was for sure. They weren't the most seaworthy if you got into rough water.

And you could get into rough water on this lake when the winds came up. I can tell you one episode.

In any event, that went over quite well, and I don't know why they finally quit it. But after I left, I guess they did discontinue it.

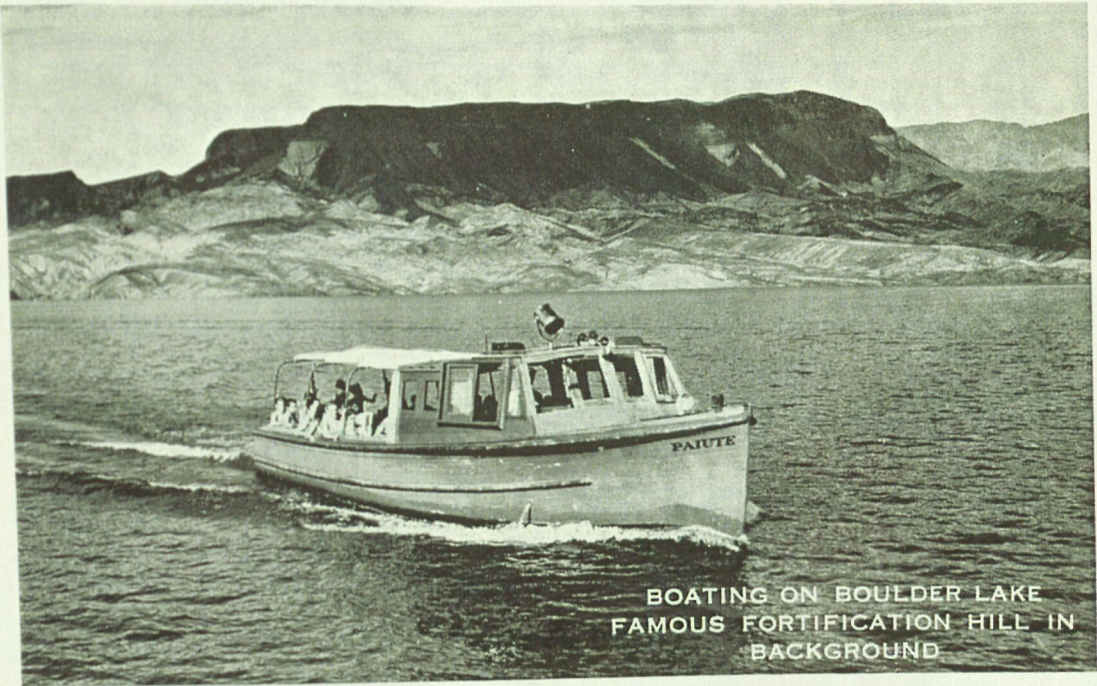
We run some tours to the dam and back. Their main interest, I think [in taking along Park Service guides] was to get their boat pilots conversant with what they were seeing. You go along on a tour you announce over the loudspeaker there so everybody could hear it, and the boat pilot could hear that, too. By the time he'd been along on some of those tours, the boat pilot knows point to point to point to point things of interest he could tell these people, and it made it worth a whole lot more to the company.

*You mentioned you could give me an episode of when the weather got pretty bad out on the lake in one of the [tour] boats?*

That's funny.

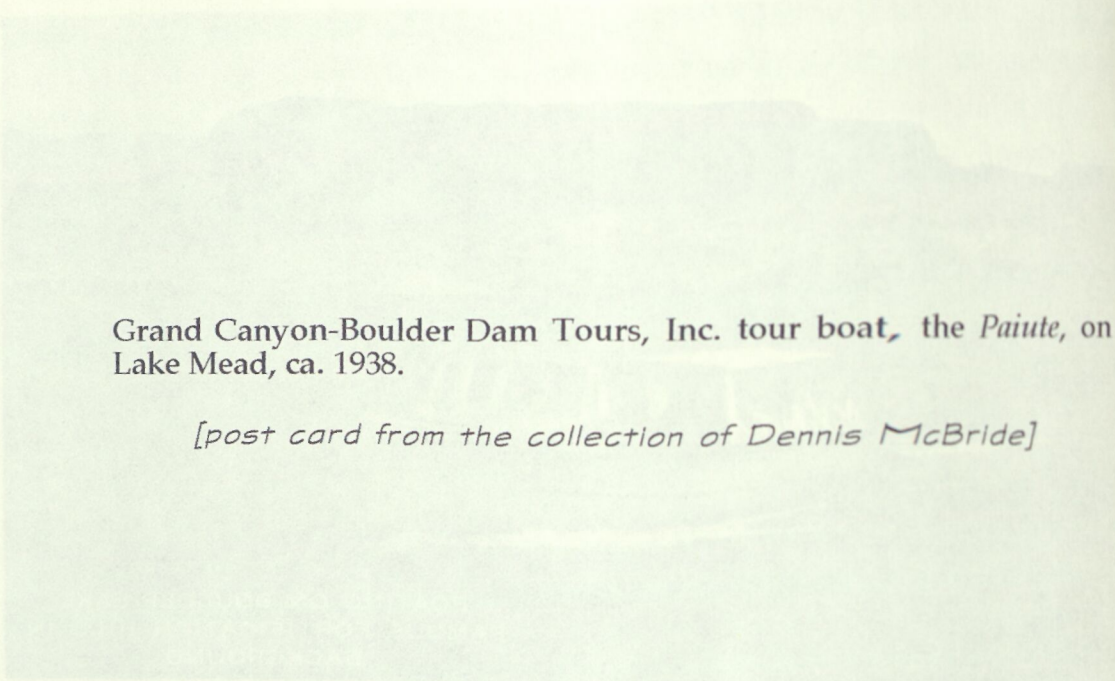
Our boat that day showed up with mostly school teachers, a special tour. Took 'em up into lower Grand Canyon. There was a man on this tour that, the way he talked, I knew darn well he was not from this country. He was English. Had an English accent—you get used to those. And so he was a very congenial man, sitting back in the back of the boat, watching the country, asking us something once in awhile.

Coming back, we'd hardly cleared Grand Canyon—we'd gone up in there about fourteen miles, almost to Separation Canyon.<sup>41</sup> We came out of the upper basin and into this middle basin down here. That's where we were supposed to come. But in the upper basin, the Virgin River arm,<sup>42</sup> they wanted to go up in there a little. So we started up in there and the wind picked up. The waves were really something and the anchor on that boat would bang against the boat itself. It was so rough. They were taking it pretty slow and heading into the waves when they could. But it was just going this way, and everytime a big wave would come in, it'd shower 'em with water in back. Two of these ladies ran up to the boat pilot and asked him if he thought they were going to sink. Scared to death. About that time they came back and asked me, "Do you think this thing will sink?"



BOATING ON BOULDER LAKE  
FAMOUS FORTIFICATION HILL IN  
BACKGROUND





Grand Canyon-Boulder Dam Tours, Inc. tour boat, the *Paiute*, on  
Lake Mead, ca. 1938.

*[post card from the collection of Dennis McBride]*

**GRAND CANYON-BOULDER DAM  
TOURS, Inc.**

Complete Transportation Service

Via

Airplane—Boat—Automobile

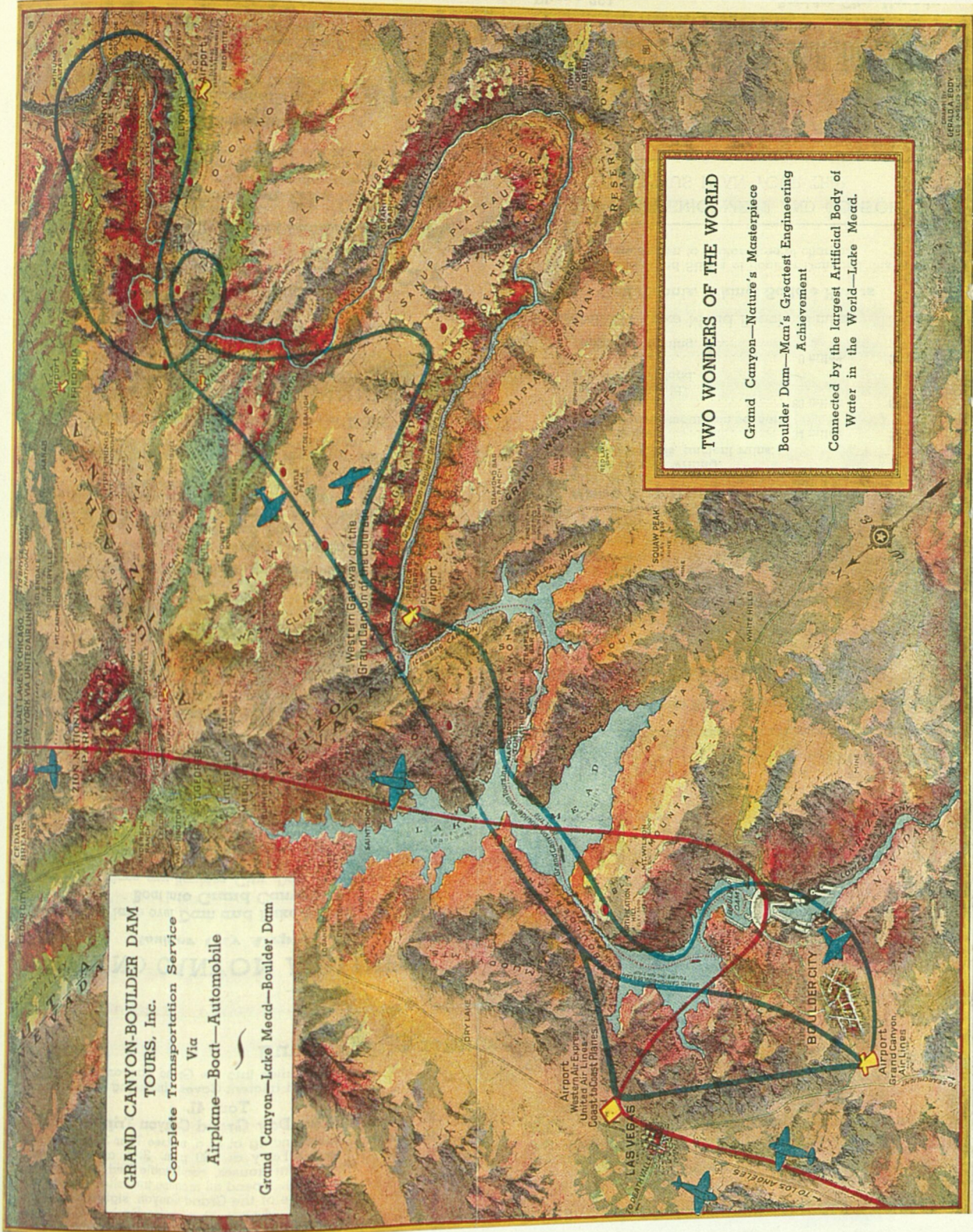
Grand Canyon—Lake Mead—Boulder Dam

**TWO WONDERS OF THE WORLD**

Grand Canyon—Nature's Masterpiece

Boulder Dam—Man's Greatest Engineering  
Achievement

Connected by the largest Artificial Body of  
Water in the World—Lake Mead.



Grand Canyon-Boulder Dam Tours, Inc. tour map of the Lake Mead National Recreation Area and Grand Canyon National Park, ca. 1938 - 1939.

[map drawn by Gerald A. Eddy; from the collection of Dennis McBride]

Map of Lake Mead National Recreation Area  
and Grand Canyon National Park  
Arizona  
1938-1939  
Gerald A. Eddy  
Grand Canyon-Boulder Dam Tours, Inc.

I told them, "I've been on this tour several times. It's OK."

About that time, this man, this Englishman sitting back there, he pulled on a kind of a little pipe he had there and he said, "Well, I don't think it will sink. But if it's going to sink, just let the bloody thing sink!" That quieted all those ladies down more than I could do.

*Do you remember the archeological excavations they were conducting down at Willow Beach about that time? What were they uncovering?*

Down at Willow Beach they found what used to be a very favorite trading station, I'd call it. There's where you find artifacts brought in from the Pacific, find them right there in the digs. Material from the West Coast, material from up in the [Great] Basin country, types of pottery that they didn't make here but undoubtedly traded for. I wrote an article for *Arizona Highways* once upon a time about prehistoric trading posts down there, furnished them with pictures of all that stuff.<sup>43</sup>

It was fascinating because you got a cross section of how these people lived there, all right. You found bones, of course, of mountain sheep, jack rabbits, things like that. Fishes. You knew what kind of fish they were eating. There was a great story there. The biggest problem was how to protect it. Now that you had it excavated, about all they could do was fix it so you couldn't damage it, just like you find it now. I can go down there today and show you right exactly where that trench was.

*I know we used to fish down there and I'd pick up pot shards right on the surface, sort of where the bend in the river was, right down there where we sat in the sand.*

Now, down below there, in [Lake] Mohave<sup>44</sup>—this is right on down stream—is where we found a whole lot of stuff, where the Indians used to camp on shore. Their campsites were marked mostly by rock formations where they'd build up a little rock wall and sleep behind it when it was windy. We found a lot of petroglyphs on rocks down there. We brought a whole bunch of them up here before the lake came up to cover the site. Lake Mohave was rising and we were getting them out of there. I'm familiar with that because I helped do that. I don't remember the Cs on that, other than that they might have reported it originally.

*Where did they bring the petroglyphs when they brought them up here?*

Took them over to what is now the warehouse.<sup>45</sup>

*Down in Lakeview?*

Yeah. Just across the edge of town here, down below Colorado Street. That's where the equipment was kept. That's where we put 'em all. What happened to those, I'm not sure. I understood later, years later, that at least the most important ones went to, I think, somewhere in Michigan or Mississippi or somewhere where they were storing a lot of archeological stuff. I've forgotten where that is.

*But they did leave the area?*

My understanding is a lot of it did. The most important stuff probably left the area.

*CCC boys, with the Park Service, also did some excavating at some turquoise mines down around Gold Strike<sup>46</sup> and Hemenway<sup>47</sup>. Do you remember anything about that?*

I knew about the mine, but I don't know the extent of their work on it.

Around Dry Lake<sup>48</sup> you can find old campsites. [The Indians] used to camp around that old lake. That was quite a lake at one time.

*The Park Service took over the old hospital, Six Companies hospital up on the hill, as [their] museum.<sup>49</sup> Can you describe what it looked like inside? What kind of artifacts they had on display up there?*

The Park Service made it an office building.

*They had a museum up there, too.*

Oh, they had a little museum there. They tried to tell the people something about what was in the area, used pictures, artifacts in some cases. Our offices

were there. The superintendent's office was there. Very comfortable, as a matter of fact.

*Were you involved in putting together any of the exhibits up there?*

Only to the extent where I could use a few photographs or something of that nature.

*Do you remember, too, then, when they moved away from the hospital down into some old buildings in Camp Williston?*<sup>50</sup>

That was after I left. Late 1940.

*Do you also remember that the Park Service had set up tourist check points at the east and the west entrances to Boulder City?*<sup>51</sup>

I don't remember to Boulder City, but I remember [they built them] at Lake Mead.

*During this early period, too. '37 is when they opened. Actually, it was CCC boys who were manning them, collecting this information for the Park Service.*

I don't recall participating in any of that when I got here in '38.

*Do you remember any of the hiking trails that the CCC boys built?*

Only the one that goes up to the mountains above here.<sup>52</sup>

*Have you ever hiked it?*

It's a good trail. They made sure it stayed in good repair, and I've been over it two or three times.

*Is it a significant area geologically or archeologically?*

Well, you're right in the middle of volcanic rock and you're looking down on a lot of geology when you get up there and take a look. There's some metamorphic rocks in the region where they had some metamorphic change, early granites. Quite a bit along there in the way of plant and animal life of interest to me.

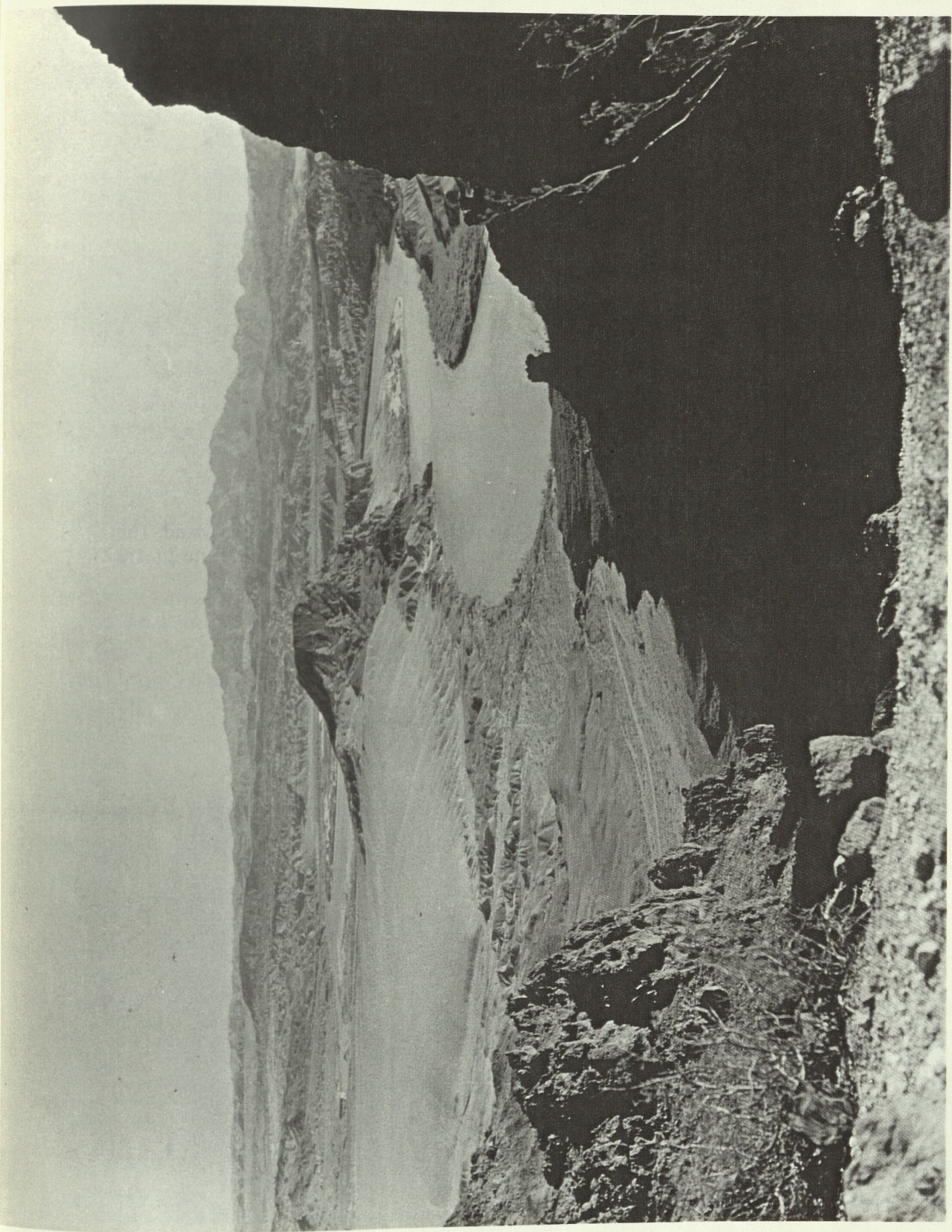
*In what way?*

As you come up out of the desert and you start climbing, you begin climbing into an entirely different environment. And the end result is you're very apt to run into a variation of species [of] what you had below.

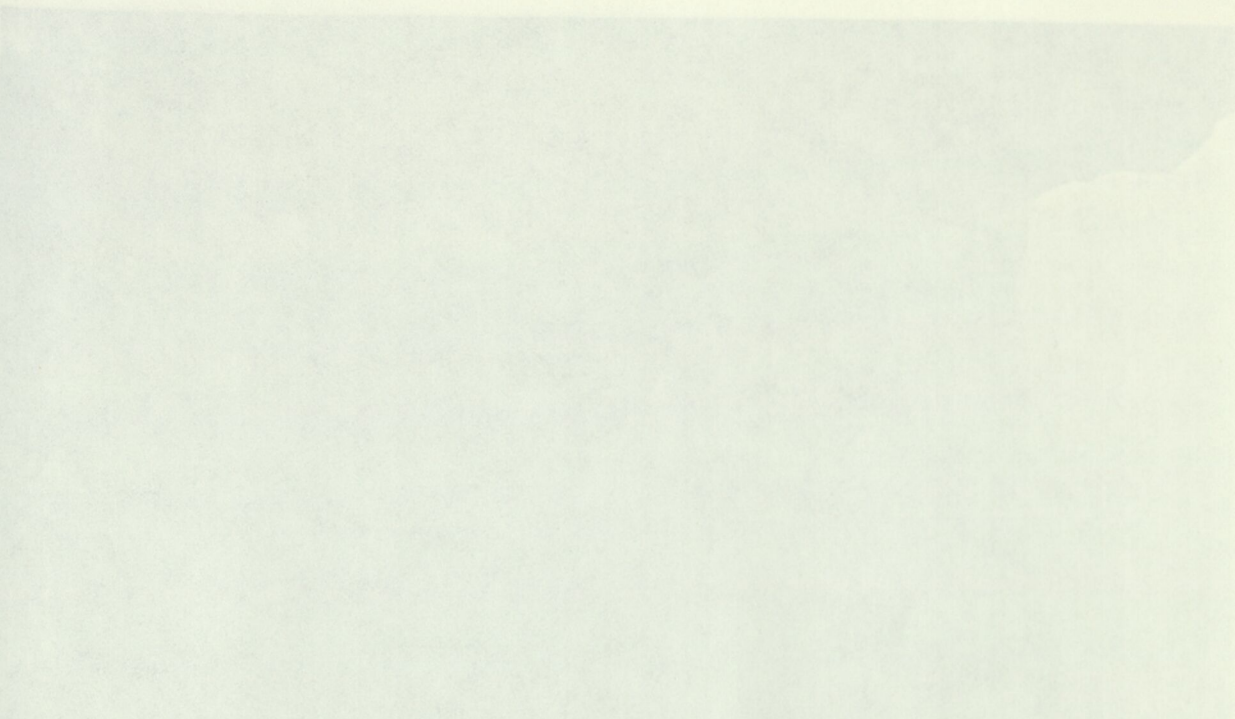
For example, if you wanted to find a chuckawalla lizard, that was the place to find them. They like these rocky outcrops and big cracks in the rocks where they can get down in there. You could go right down on the desert below and get lizards there. But if you wanted a chuckawalla, [the trail] was the place to go. That's where I got my pictures of 'em.

*I want to talk about the rising lake. In that article Ihla Crowley wrote about you,<sup>53</sup> she mentioned that you describe to her areas that were lost, ultimately, species that were lost. In terms of animal life, how did the rising of the lake affect the habitat?*

It drove a lot of animals out of their habitat to start [with]. They had to make do somewhere else. This lower basin, just as soon as you hit the main lake, that whole basin through there was desert, of course. And when the lake was coming up, I believe there were sixteen islands formed out in there, depending on the height of them—they eventually began to go under. What I did here then was get a rowboat down here off of Hemenway and visit each of these islands as I could get the time, see what was on them. This was at a time when it was quite apparent, from the way the lake was rising—and you knew how fast it was going up—how long it approximately would take until they'd be covered. So you plan your time so you could get out to see that before the lake put [the islands] under. That way I could get a very good cross-section of what kind of life was in there before the lake, because all that was in there was pushed up on all these high points. I could make a pretty good record there of any species of reptile, mammal. That was the place to go if you wanted to know what was going under.

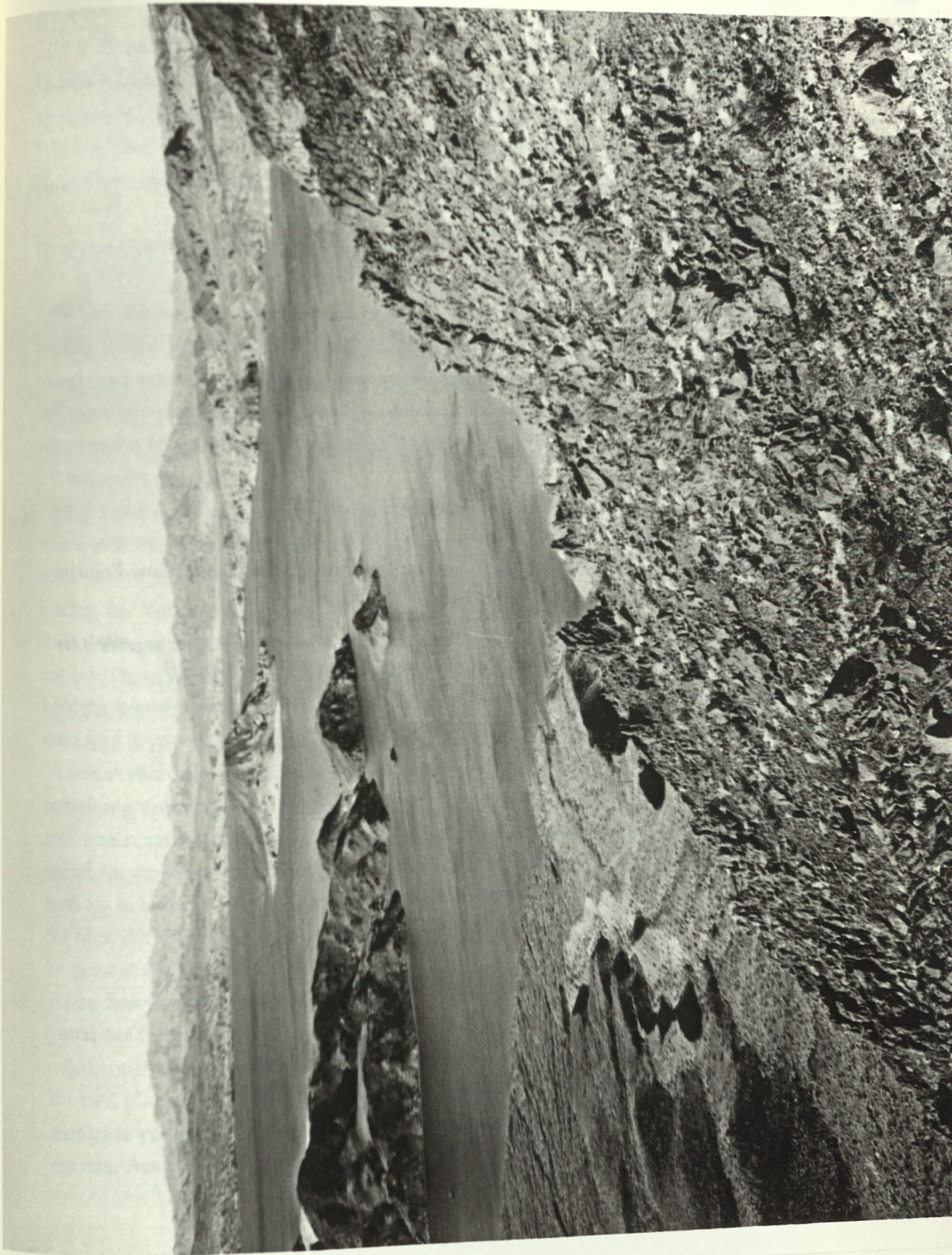






The Colorado River winds through the future bed of Lake Mead. This photograph was taken from Monument Pass at 6:25 a. m., June 23, 1929.

*[photo courtesy of the Bureau of Reclamation]*



Lake Mead rising. This photograph was taken from Lake Mead View Point on  
July 25, 1935.

*[photo courtesy of the Boulder City Library (Bechtel Album 3, photo no. 3353); negative in the  
possession of the Bureau of Reclamation (Roll 44, photo no. 4)]*

Up at Overton, around there where the Lost City was and where old St. Thomas<sup>54</sup> was... . St. Thomas was an interesting point to me because when I went into St. Thomas the water was coming into the town. People couldn't believe it. They just couldn't believe the water could ever get up there. Well, they knew. It was quite a sight watching people trying to get out.

*Do you remember seeing people trying to move their stuff?*

Oh, yes. I'd see 'em back their truck to the door of the building and start loading it and get it out of there before the water would come in and cover things. And when it actually got deep enough to wipe out St. Thomas, there was still some two-story buildings in there. I actually can remember talking to a man who went in by rowboat to that second-story window there upstairs.

It was quite a sight.

What I did a lot there, though, in addition to watching St. Thomas disappear, was watch the effect on that valley. It was an agricultural valley. You could see rows and rows of plants that had been planted there [before] the water started coming in. You could trace its progress by seeing how fast it came up those rows. When it came up, just like in Indiana, there was a lot of shrubs they never cut out. Those became the hiding places for small mammals. They were pushed up right into the shrubs. Wood rats, pocket mice, white-footed mice, things like that. And if you wanted to see what was in that area, there was the place to see.

I wasn't the only one interested in that [shrubby] area. If you wanted to have something entertaining, you'd get your binoculars and get up on a higher point and watch across there. You'd see, as the water come up and pushed out some wood rat or something, he could see the shore near enough to where he was, he'd try to swim it. He'd get ashore, and he had a welcoming procession waiting for him. It'd either be a fox or a coyote. They'd run right in and get him before he got out of the water.

And hawks patrolled that area. Red-tailed hawks especially. During that time you'd see them quite often.

So I could see a lot about animal life and plant life in there. It destroyed one of the best places to see the species of mesquite, honey mesquite. It wasn't regular mesquite you see all around here. It was honey mesquite, it was different, a sub-species. And it was a great place for birds. Oh, boy! That was the only place in



### **Top Photograph**

Aerial view of Lake Mead submerging the site of St. Thomas, Nevada, ca. 1938 - 1939

*[photo courtesy of the University of Nevada, Las Vegas library, Special Collections Department: Dorothy Dorothy Collection (0131:0091)]*

### **Middle Photograph**

Lake Mead submerging the fields around St. Thomas, Nevada, ca. 1938 -1939

*[photo courtesy of the University of Nevada, Las Vegas library, Special Collections Department: Pueblo Grande Collection (0143:0493)]*

### **Bottom Photograph**

Lake Mead submerging the fields around St. Thomas, Nevada, ca. 1938 - 1939

*[photo courtesy of Nadean Voss; negative in the possession of Dennis McBride]*

this region I knew you could find a vermilion fly-catcher. They're found down south farther, usually. They were nesting in there and that went under.

*Do you recall what the rate of rise was on the lake? How fast it came up? It sounds like it came up fast enough you could stand in one spot...*

Yes, you could. You could watch it come into those rows I told you about. You could actually watch it trickling in. Well, I don't know what the exact rate is. About a half-inch an hour. You didn't go back and look at something, and then go back a week later [to find it]. It might not be there. That was the way of the Lost City. Figuring told you that in 24 hours that Lost City was going to have water around it. And it did just that, too.

*I wanted to go back and talk about when you were taking your rowboat around to all the islands in the lake while it rose to see what was there. What kind of animals life was there? What did you see on these islands?*

Well, the first thing that would happen when your boat hit the island, and when you grounded that boat on the island, if there was a rattlesnake on that island he'd buzz. You'd hear it before you ever got out of the boat. That was a little caution, to watch where you walk. You could find reptiles on there, lizards especially. Poor old lizards had no place else to go, and when the water came in they couldn't swim but for a short distance. They'd just drown. I brought lizards ashore quite often. Just put them in a box, a big box and bring lizards ashore. Snakes you didn't ever need to worry about. They could swim. Rabbits. There was nothing you could do about them. Cottontails, I thought maybe you could maybe catch some of those, but those islands were covered with creosote and other bushes. Try to catch a rabbit in a bush that big.

But I noticed one thing, when they'd get thoroughly alarmed, they'd jump into the water and try to swim. Well, they can't swim worth a darn. Their fur is just like an absorbent of some kind. They'd just become water logged instantly, and that's the end of them.

Small animals, like the wood rat, can swim quite a little ways. But if the island's too far off the main shore, the wood rats would drown, too.

Another funny thing happened, too. If you were out there quite a lot, just sitting there watching to see what was going on, things would begin to move

when there's nothing to scare them too much. White-footed mice would come out, run to you or there someplace. And sure as anything, they'd find the rope from the rowboat anchored here just offshore. They'd come across that rope, and before you knew it, you'd have three or four white-footed mice go on board and they'd hide and you couldn't get 'em off. So you'd take 'em ashore and hope they got off later.

*You sound like Noah's ark.*

You sort of felt like Noah's ark because you had white-footed mice, kangaroo rats, wood rats, and pocket mice, and ground squirrels, the antelope squirrel. On one island I found a beaver. He was trying to see what he could find on it, I think. He could go anywhere. But I have pictures of that beaver on that island. That was an oddity.

And on two islands that I know about, just on this end of Boulder Canyon—there's an island there—there was a big-horn ram trapped on there. We used to see them on those boat tours going up to the canyon. And a kind of pathetic thing happened. The pilots got used to seeing them there, too. So on the morning I went up with them they wanted to circle [the island] to get a good look at the ram. But they didn't see him. So they couldn't wait and see what happened to him, but they reported it. A ranger by boat patrol found the ram. Somebody had shot him right through the head.<sup>55</sup>

So I knew about those. And over on the Virgin River arm, there's an island in there, a pretty fair-sized island. There was a big-horn ram trapped on that. But he could swim ashore if he wanted to go. I don't know what happened to him.

Right on the shore down here there was a fox den on the island, became an island. And I'd go down there of an evening and watch them. As the water was coming up Mama fox was taking those little foxes one at a time and carting them somewhere. She'd grab them by the nape of the neck and swim, get ashore and take off with them there. I was there [when] the last little pup was [ready] to go. He was yipping and yowling—he was by himself. She was sure a welcome sight when she showed up there. That was an interesting thing.

We were always being asked if it could have lived there. It could have, because there was enough land on that island, still is out there, to take care of a few mice, things like that, lizards, things of that nature.



Those lizards would get right down against the water's edge. When this water was coming up, they would be down there and the water would come up to them. And when it started lapping around their sides, you'd think they'd run. By golly, they wouldn't run. They'd just stay there until it kind of floated them ashore. It'd bounce them ashore. Those lizards were afraid of that water, didn't know what to do with it, so they were easy to catch. No trick at all to catch a lizard.

*I have a picture in my mind of dead animals floating in the lake that got drowned on the islands. Was there much of that?*

I don't know how often they would have seen them there. Some of them would have gone right down and that'd been it. Rabbits, mice. They would have been out of sight. They wouldn't have floated long, I'm sure. But I don't remember seeing any there that way.

I was interested in another story, though. What effect does this rising have on fishes? We had three species that lived only in the Colorado River. Squaw fish grow big.

*Are they a fish that you can eat?*

Oh, yes. They look like an overgrown salmon almost. I used to go down there when the fishermen came in. I wanted to see their fish, measure them, see their stomach contents and what they were feeding on in that lake.

One of the commonest questions that were asked by fishermen, they'd hold up a [squaw] fish and ask, "What kind of fish is this?" So big, hold it up, tail on the ground. I'd always tell them that was a minnow. And they'd laugh, and I'd tell 'em, "Don't laugh, it *is* a minnow. That's a squaw fish and he's a member of the minnow family." So then they'd have to know about a squaw fish.

A squaw fish, the only place it'd breed was in muddy water. In the Colorado, it'd get into those coves back there [where] it was shallow, but still muddy. There's where they'd raise their young, lay their eggs, and so forth. So a squaw fish was a fish you could fish very much like a bass. It'd hit a plug. Fishermen would come in worried about that. Something had hit a plug and it wasn't a bass. Sometimes they'd come in with a story about something hit their plug, and "Did you know the thing on the other end could pull my boat?" They didn't know

what it was. Well, it was a squaw fish probably. They grow about this long, very powerful fish. They'd grow up to three feet.

I was always interested in how many squaw fish they caught.

*Something that I find interesting. At the time, do you remember how you felt about And did they catch many as the lake rose?*

It wasn't uncommon because they'd bring them in. Everytime I'd go down when I thought they were coming in to see if I could get a line on what they were catching, see if they got squaw fish, usually about the size of a trout. But they'd get one of these big ones every so often, and I have a picture of a big one. This guy was holding it up like this, and the tail was clear down against the ground. Looked like a whale.

But the rise of the lake was dynamite as far as the squaw fish were concerned because it took out their breeding grounds. They couldn't get along, I guess, on kind of a second-rate [situation].

[Another thing] coming up from down there, there aren't very many of them, but on one of those little islands down there we found a Gila monster. So we brought him up here, put him in a bag and brought him into the office up here in the hospital where the offices were. The next morning we were told about that. He got out of that bag and the assistant superintendent was working and thought he saw something moving around there, and here's this thing down by his foot. He about kicked the table over, he said. He was sure down on the naturalists for awhile.

*We were talking about the beavers.*

Yeah, they lived along the river, and by golly when the lakes came in there was nowhere for 'em to go. You could actually find beaver down there near the dam. They were in those overhangs and cliffs as you come in out of the lower basin and make that straight run toward the dam. You'd find one every so often on a ledge just above the water. In lower Grand Canyon is the best place to see what happened. They go up in these side canyons—and that was a perfect place for them. Still water, plenty of food. You could find all kinds of cuttings up there and beaver houses and things like that. If you were up there today, you'd find a lot of beaver. I'm sure of that. And on Lake Mohave you can find them, down on

the lower end of the lake, about five or six miles from the dam where cottonwoods are growing.

*Something that I find interesting. At the time, do you remember how you felt about watching these habitats being submerged and the animals trying to get to safety?*

Well, I felt frustrated because there wasn't anything you could do about it. There was nothing anybody could do about it. That water was coming and there wasn't anything to stop it, no way you could slow it down, no way you could direct it somewhere else. And here was an island. You knew darn well that you go out to one of those places and there was quite a wildlife scene. And you knew darn well that if you go back there a week later, there isn't going to be an island. And all the animal life that was there, you can well imagine from your own experience watching them try to do something in the water when you were there, like a rabbit, for example, or a wood rat. You'd know a wood rat can swim and a rabbit can't. And you know that, "Well, on this island I saw two or three jack rabbits or a rabbit or a bunch of kangaroo rats or something," and you know darn well they're not going to make it.

*Did you feel like you had a sense of mission to try to save what you could, or at least to save specimens of what you could?*

I can't say I had a sense of mission, but I tried to save what I could. I could save lizards, small mammals if I could catch them, mice you could catch every so often. But for the most part you know you're helpless, there's nothing you can do about it. You can watch them on the island,. You can't catch them because they're a little too handy for you around the bushes or rocks.

*Do you know whether anybody ever went hunting on those islands where the animals couldn't get away? You mentioned the big horn sheep. But other animals?*

Not to my knowledge, but it wouldn't have been surprising if they did. Good target practice out there for somebody. Those two cases of the big horn, that was something that bothered me considerably. And the coyotes. Coyote trapped out there in the Virgin River arm, the fox in the lower basin.

No, I had a sense of frustration because you knew there was nothing you could do about it.

*Did you ever feel maybe they shouldn't even have built Hoover Dam? Was the environment unique enough? I mean it's a sensitivity we have now that they really didn't have much then that I'm aware of.*

Well, I don't have the feeling they shouldn't have built the dam, but I do have the feeling maybe they could have had a little more consideration about what they were doing to the wildlife. Maybe taken some steps that would have helped. Certainly they had enough problems with big horns, and I thought that maybe we could have been a little more considerate of what we were doing with the big horn, but I don't know how we really could have stopped it.

*What was the professional and administrative association between the Park Service and the Bureau of Reclamation as far as the Lake Mead Recreation Area went? Who was responsible for what? Were the relations cordial between the two organizations?*

As far as I know it was. It was a kind of a joint operation in a real sense. They were interested, of course, in activities on the lake. Boating, things like that. They were definitely interested in some things, like contamination of water.

*You mentioned having known Chester Longwell.<sup>56</sup>*

He was at Yale when I was there. I wanted to take a course, I had never had a course on geology. It was all on wildlife, natural history, English, psychology, so forth. I wanted to know more about the subject, so I took a course under him.

*What kind of teacher was Longwell?*

I would say he was almost an ideal teacher. He wasn't demanding. If you didn't know, he didn't look at you like *Why* don't you know? Very patient. "You have this," [he'd say]. "What do you see in that? What about the color of the rock? The shape of the rock? The texture of the rock? How do you think they would identify that?" Very quickly you learned such things as the rocks that are fallen rocks, or rocks that are broken loose, or rocks that are water-worn, transported

by water, and so forth. Up at Zion, I could take that and go right down to the end of the Narrows Trail of Zion where the river's coming through the canyon, take a rock out of there, and point to them, and say, "What do you see in this rock?"

Well, they'd point out it was water-worn. The river brought it here.

"How do you know that the river brought it here? This rock that you see here is volcanic, and there's no volcanic rock around here. So, therefore, the river has to have its heading up there somewhere where they have volcanic rocks. You know that upstream a ways, up the canyon a ways, you get up there on that plateau, you're going to run into volcanoes." And so on.

So he was very good at getting you interested in the rock first. Not volcanic ages and geologic ages. He'd once in awhile say you find this in such-and-such an age, or this is paleontology you're talking about here, or this [rock] is metamorphic, and this is Mesozoic, or whatever. Gradually, you begin to learn all those phrases, begin to learn all these difference. And *then* when he started talking about plate tectonics, he begin to make sense. You could see why some of these were found on mountain tops and others were found down here somewhere. And this is why we find them here today, and so forth.

*What year was it you were in Yale, or years?*

1939 and '40.

*So [Longwell] had already conducted most of his work in the southern Nevada area by then.*

Yeah.

*Did he have at that time a very prominent reputation as a geologist?*

Oh, yes. In the scientific world he was extremely well-known. A lot of people never heard of Doc Longwell. But if you went to a place like Yale or Harvard or somewhere like that and you get close to anyone taking geology, they'll tell you all about Longwell.

*I think they have Longwell's papers at UNLV, in the Special Collections Department.*

Undoubtedly. And in those files they'd have the work he did down in this region, because he did quite comprehensive work down in here before they ever built that dam.

*Did you remember Longwell after you got down here and saw what he'd studied?*

Oh, yes.

*Did you do much geological study yourself in this area?*

Not except to identify. Work had already been done on the origins of all these things down here. I was interested in an area as to why do you find it that way? Why isn't it like anything else around here? How was Fortification Mountain<sup>57</sup> over here formed? What story does it tell? A naturalist is more interested in what's the story. Fortification, you see, has 52 distinct lava flows on the top. You look, it's band, band, band, band. Fifty-two times that thing's erupted. You go to the top, you'll find a volcanic plug in there. On this last eruption, it just solidified, and that was it.

*Which end is that plug at?*

It's almost in the middle. The thing slopes a little bit this way [*gestures with his hand*]. [The plug is] just about where that knuckle would be. Next time you're down there, you look at that thing and the silhouette across the lake there. It looks like a little kind of uprising there in one place, you'll see it. That's the plug. I've been up there two or three times.

*Does the river cut through that flow?*

Yes, because part of that flow is clear over there on the other side of the lake, at Callville. The lava flows in there are part of that old original flow off of Fortification.

*What kind of eruption was it, or were they?*

It would be a very quiet type of eruption, not highly explosive, like that. These lava flows tell you it just came up and started flowing.

*They're Hawaiian kind of eruptions. Not pyroclastic, the kind that's very explosive.*

Pyroclastic. You get glass out of that kind of stuff. You won't find that here. No obsidian on this stuff around here. Just basalt.

*Is this place very seismically active, aside from the weight of the lake? You've heard all those stories that the weight of the lake triggered earthquakes. But they've had other earthquakes centered in other places around here.*

Anytime you find mountains, you're going to find seismic action has taken place, maybe not continuously. But you can bet you'll find faulting. There's a good fault right out here at Railroad Pass, you know. It parallels the mountains there at Railroad Pass, goes down the far side of Dry Lake, right around those mountains there. You'll see it in the talus slope,<sup>58</sup> in the talus coming off of those mountains. Here about six or eight years ago, they had an earthquake, you could see where this line cut right through.<sup>59</sup> You can see it there yet today. So yes, this region has its share of faults. There's a good-sized one or two on the other side of Boulder Canyon. And that's why the earthquakes around here were pretty shaky, because when the lake was coming up all that water on a block in there formed that present-day valley pretty much.

*Do you remember those seismic stations they had around the lake? They had one at Pierce's Ferry, I believe, and they had another one in the Ad Building on the hill up here, and the third one, I don't remember where.*<sup>60</sup>

No. I know where the one was at Pierce's Ferry and up here [in the Administration Building], but I don't know where there was anymore.

*I think they had three, but they dismantled them not an awful long time ago.*

*We had a good conversation about the wildflowers that grow around here and you told me that there were several very specific conditions necessary for the big [wildflower] shows we have once in awhile. Would you tell me what those [conditions] are?*

Actually, you have to go back to the creation of the seed. One of the first things that a wildflower—now, we're talking about a particular type of creature here: these are annuals. Many wildflowers around here are perennials. In other words, they live the year round. The annuals die at the end of the flower season.

The first thing that ever has to happen to an annual is to put out a lot of growth, work all its energy to produce a flower that can be pollinated. And hopefully there'll be enough pollinating insects around to pollinate it. But it's a race against time in a real sense for an annual to grow big enough to produce a flower that's big enough and attractive enough to attract insects and be pollinated.

When it's pollinated, then the seed, as it develops, develops a thin coating on it that's microscopic. You don't see it just with the naked eye. But it's a thin coating around that viable seed. And it'll stay there until conditions arise that will make it dissolve off there. What happens then, of course, [is to get the] seeds distributed. The wind helps out a lot, of course, and birds, do, ants do. Ants are always on the lookout for seeds. They take a lot of them home, they bury a lot of them themselves, and pretty soon an ant gets killed and nobody else knows where those seeds are. And we find wood rats and pack rats and kangaroo rats are seed-eaters and seed-gatherers. They help spread those all over. Same way with pocket mice. And so that's how it gets spread.

Well, there they will lay. Animals would tend to bury them, so you don't need to worry as far as under the surface. Those that are not spread in that way are spread by winds. Winds carry a lot of dirt with them, a lot of sand, and everything else, and eventually cover [the seeds] over. So there are various means by which those things are put in a position to germinate.

Then there has to be two conditions. I've read quite a bit on this and I've watched quite a bit on this and the more I watch the more I say you can't fool Mama Nature *too* much. You can be a little premature in what you think is going to happen, but here's what happens as far as I can determine and as far as anything I've read. First is, these [seeds] lay around right through the rest of the summer, you see, not bothered even by rains, wouldn't bother 'em at all. And so they enter the winter months. Usually long about October the weather begins to cool down. Then through October, November, December, and January, during that time there should be at least three or four inches of rainfall. And it shouldn't be gully-washers. It should be just gentle rains for the most part. After a rain, there really shouldn't be drying winds to dry out the surface too much, because



these [seeds] are not very deep, now. So the end result is when it approaches February, for the best possible conditions, [there should be] somewhere in early February another good rain, just to kind of trigger it. That's fine. That's the requirements for moisture. The second thing is, during those colder months, and until it reaches that time for germination, the temperature should not normally exceed a 60° mean. So it's temperature-controlled. It can go as low as it wants to, but it can't go as high as it wants to.

Now, looking at this year [1995]. Last fall, winter we had good rains all the way through, plenty. But then along in January, what happened? We had some rains, but we also had temperatures reaching up to the 70s. The temperature control will not allow that [seed's] coating to come off. So they're waiting for the next year to roll around. There are all kinds of evidences and records where you find no recorded moisture to speak of or too early spring, and seeds like that will lay for ten to twenty years just waiting for the right time.

*It just waited too long this year. The conditions that control it got thrown out. Why is it that when the temperature's too warm, that coating won't dissolve?*

'Cause it's required that it stays cold during that germination period. *Is it just an aberration or a trend? What were some of the last good shows of wildflowers around Boulder City and Lake Mead that you remember?*

*It is a trend, and it was a trend that began back about 10,000 years ago when* We had what I call a real flower show, the last big one was in 1973. Prior to that was in 1952, I believe it was. In other words, they don't happen ever year. But like about four years ago, for example, down below Boulder City there were quite a few flowers. And over around Willow Beach, the lower portions near the lake had quite a few flowers. Very showy enough, but it didn't begin to approach what I call a flower show like 1973. *dry, and we may be headed that*

Nature does not allow in its operation for a plant to just automatically extinguish itself. In other words—I'm convinced that's what happened this year, too—seeds that were on a slope, in washes and slopes and so forth, if a lot of them are on a broad slope area here where, on this side it's facing east, north and east, and [the other slope] is facing south and west, all the same kinds of seeds and everything. The morning sun coming in will hit [the north and east] slope, but not with any heat yet. It's been cold during the night, too, so it stays relatively cool through the day. When the afternoon sun barrels in there and hits

the other slope, those [seeds] will *not* germinate, while those that rode right through *will*.

*So one side will carry through for another time.*

Yes.

*1973 and 1952 would suggest roughly a twenty-year cycle. Is that true?*

It isn't a twenty-year cycle, but it's a lengthy cycle. I've always said it's fifteen to twenty years or so.

*So we're overdue.*

It just waited too long this year. The conditions that control it got thrown out of gear.

*People do talk about that, in the last few years, the weather changing, getting so much hotter than it used to be. Is this true from what you've seen? Is it just an aberration or a trend?*

It is a trend, and it was a trend that began back about 10,000 years ago when you had a gradual drying up, a gradual warming up. Our weather records for the last four years, I remember reading somewhere, have gradually warmed a little bit. Half a degree or a degree a year or so. That doesn't mean much at the time. But in time that half a degree or something [each year], it doesn't take many years and you have warmer weather.

We had drought here in recent times, very dry, and we may be headed that way this year. All the trend now is for clearing, warming up, warming up and clearing. If this continues as it has been doing now in the last two, three, four months, why, we can't expect much moisture in the summer at all. There's a gradual warming trend over the North American continent taking place. It's gradual, but it's there.

*What effect would this warming trend have on the flora and fauna in this area?*

Well, it's pretty hard to say. They would adjust. It'd have to be something dramatic that would suddenly cut 'em off. They will adjust a little more and a little more and a little more. Animals do it and plants do it. Even birds do it.

*So we're not likely necessarily to lose species [because of the warming trend]?*

I wouldn't think so. Those seeds operate genetically, the same as other things. The gene tells us when it's germination time. And it won't vary a heck of a lot from that germination time, neither before nor long after. It'll hit right in there pretty close. Whatever the genes have already established through the centuries where that germination time is. When that time comes around everything ought to be in order or there isn't going to be any flower. It's difficult to see how that gene could be altered as time goes on as the plant reproduces and reproduces and reproduces, gradually adjusting to conditions. The ones that [don't] adjust, the seeds that [don't] adjust, never will germinate then. But those that *do* adjust will meet the new condition, if it's a little warmer, a little colder, it will meet those conditions. And the plant that comes from those will already genetically [re-]set for a little different germination date.

*Relative to the plants and animals in this area, to their scarcity or abundance, in the period that you've been down here—when you were here in '38, and then you came back again and you've been here about thirty years—have you noticed any that have disappeared, or others that have taken their place, or otherwise changed in any way?*

Animals—you can say there'd be a change there, depending on their food. Many of the food sources for animals in the desert have been circumvented by people moving in. That wasn't normal at all. People moving in, or they put out a bounty on predatory animals and birds, reduce them, has an impact on what they were living on. Or you may reduce the animal by changing its environment, its habitat. That's what's happened here. You don't find things in the abundance here that was here not long ago. There were deer common in the Black Canyon before they built the dam. I have records of deer being hunted in Black Canyon. There were antelope in this region before they built the dam, in that broad valley running down to Kingman. There were antelope recorded by some of the early diary-keepers that came in here long before the dam. So change of environment will have its effect usually in a very direct way on any

animal that lives off plant life, or that's more of a carnivore [and] which lives off of animal life. And if something happens to upset the apple cart on one or the other, it's reflected on the one that depended upon it.

When I first came in here [1938], there were no deer down below, but I knew of records of it. Some of the early Mormon records, settlers in this region—they were diary-keepers, all of 'em were—and you find all kinds of records of things they saw. But I never saw any deer here. But in recent years, now, there was a record I heard about of a deer antler being found down there on Lake Mohave. I have every reason to believe that's true. It was told by fishermen coming in to the boat docks down there on [Lake] Mohave, [a story] about a deer antler, finding deer in there. They're long since gone. And the reason, of course, that they disappeared, two reasons. First, when you started building [Hoover and Davis] dams you brought about four thousand people in here that needed deer meat for food if they could get it, so the deer disappeared. Second thing is when this lake was created, Mohave was created, it covered up a lot of deer food. So the [loss of their] source of food would have reduced them considerably. Not only deer, but small animals. The antelope squirrel that's a seed-eater. The jack rabbit, the cotton tail—I found them on the islands down there [when the lake was rising], but you don't see very many of them out now because the lake has covered up so much of their territory, the two lakes.

Take beaver. Used to be beaver were common all along that Colorado River. It was famous for it. Jedediah Smith, when he came in here trapping beaver, he exclaimed on what a wonderful number he saw there and they trapped. They got a lot of beaver skins from that. You very rarely find a beaver along there now. In the upper part of the lake, Lake Mead, in the lower Grand Canyon, you *will* find them because of these finger canyons coming down to the river like this [gestures]. And now [the water's] backed up into those and [there are] little lakes, literally, in there. And they're often cut off, silt coming down here all the time cuts off the entrance to it [and] there's already a little lake. But the [silt] finally builds up almost like a wall, in a sense, plugging up these things, and beaver think that's great stuff up in there. So I've seen quite a few places in the lower Grand [Canyon] where you find that.

And we know that fishermen down here have been reporting in the last two or three or four years seeing a beaver occasionally up here above the Boulder Canyon in a wash coming in there. So it all adds up really to supply and demand.

If the material's there that an animal wants, unless there's something unusual happens, he'll be there taking care of it.

We used to have mountain lions in here. We had two records of mountain lions crossing the road down here between Boulder City and the dam. Well, you have to ask yourself where did they come from and what do they live on? There's no deer known to be in Black Canyon, but if a mountain lion's heading for Black Canyon he expects to find something there besides maybe mountain sheep. They [can] live on mountain sheep. How abundant was your mountain sheep? That was one of the first questions I had thrown at me from the wildlife standpoint. How abundant is mountain sheep? I knew very well there were bounties on mountain lions and bobcats and coyotes for turning in skins or trophies off of these things. The number of any of those animals had been reduced quite a lot.

Well, the thing that happened of course was that the source of food dwindled away for all those animals. Those that were on the mountain tops down here that formed islands when the lakes came up used to live in that whole valley country through there. They didn't have any place to go. So you just arbitrarily lift out of existence certain numbers of those animals. Some of them can live on a lot less so they lived along what became the shorelines of the lake, but they didn't have the vast expanse of food-producing region in there for them.

Plants do basically the same thing in this region. When you stop to think that along the river there were cottonwoods, willows, things like that. Not along the river anymore. If you find them, you're going to find them way up in the headwaters somewhere, or where you find a delta off of the main river, or beaches running way back up the slopes. There you'll find those, but their abundance has been controlled in this region in very different ways by the river, by the lakes. Look at the square miles of lakes, water surface.

The whole thing is in the desert, I think more than any place I've ever lived, you find more the impact of climate and of the environment, what happened to your environment. How much did it retain its original composition, and how much of it was altered in many ways. Out there where the antelope used to be, for example [the valley near Kingman], that became cattle country. And the antelope and cows eat the same food. Then there was a certain amount of hunting took place, and the antelope disappeared. The deer was in the same situation. They had plenty to eat on in Black Canyon, Boulder Canyon, places like that, but they had no means of having anything to do with controlling numbers because man coming in there sure decimated them. And mountain

lions that were there were helping out [controlling the deer population], but man didn't like them killing off his deer, so he shot the mountain lions, too.

I belong to the George Wright Society, which maybe you've probably never heard of. George Wright<sup>61</sup> was the man who started the Wildlife Division of the National Park Service long years ago. I used to know him when I was first breaking into the Park Service. Trying to break in. George Wright was a much-respected biologist and ecologist. He felt that even the parks needed to know a lot more than they did about their ecology in the park. Especially their wildlife and what's happening. They said you were supposed to keep things in a natural condition. He points out [that] unless you can control the environment around it, you can't control it, because it would be like osmosis. It'll work in. And so he got authority to establish the Wildlife Division of the National Park Service. I met George Wright when I was at Grand Canyon, working down there in the 1930s, and got to like the guy. He made sense to me. When my job with the interpretive division of the National Park Service as a seasonal naturalist in Grand Canyon was discontinued, it was George Wright who sent me a wire saying, "Why don't you join my division?" And I was with the Wildlife Division then for almost four years. George Wright was killed accidentally traveling to one of these areas to make a study of it.

So there was formed about a half a dozen of us who knew George Wright and worked with him. Some of the guys like myself wanted to set up a group dedicated to the same thing he was doing, and we'd called it the George Wright Society. They issue a bulletin every month. They make studies—there are several members now, scattered around over the country—and they make studies of certain wildlife conditions or plant life conditions. Ecological studies and how they affect, whether it be in a national park or somewhere else. Most recently they've been interested in what's happening to the Everglades and to the water in southern Florida. And the animal life in southern Florida. They publish these things and they have an annual meeting or two strategically located over the United States. I remember the first one I attended in Washington D. C. And, by golly, they were a good group. They're not interested in just belonging to a society. They like to see something done, and they furnish the trained people to do it. So George Wright, if you ever hear that name, you'll know he's a much-respected wildlife man.

He helped to stimulate my interest in ecology. I could see it at Grand Canyon. You saw nature working out there for you. Interestingly enough, I could use an

example in giving talks. The squirrels. On the north rim of the Grand Canyon is the Kaibab [squirrel]. On the south rim is the Abert squirrel. They're both in the same genus. They're all the same species. They occupied all that upland region at one time, and the Colorado cut through there and isolated these on the north side and those on the south side. And they both developed a little bit along their own requirements to meet the condition. On the south side [it's] much warmer and much lower, different kinds of foods. The north side is much higher, they have heavier winters. And so the north side developed a squirrel built identically to the one on the south side, had much the same markings. But the one on the north side was almost black. The one on the south side was typical gray and brown. Interestingly enough, you see adaptations. The Kaibab on the north side has a white tail. The Abert on the south side has a little white on it, but not much. So why the white tail? Because these are out in the winter and there's snow. And if you startle him, his [white] tail comes right over his back like that, and in the snow you can hardly see him because it's a plume tail. An adaptation. The one on the south side doesn't have anything like that to worry about. He's more interested in nut-gathering and things like that. So he's a nut-gatherer more than the one on the north side. The one on the north side will gather pine nuts and all like that, but it depends on growing buds a lot. New buds they eat. Great stuff. So if you ever get a chance to see a Kaibab squirrel, you take a look at that plume white tail that comes over his back,

But that was a perfect example of ecology, how they both evolved, first together, the same thing. Yet because they were forced apart by nature here, they had to adjust. The ones on the north side kept finding more deep snow than they used to and they adjusted to it. The ones on the south side changed their food pattern a little bit because it was more abundant, and they adjusted to that.

*Another little animal that I've never seen, but I've seen pictures of, and some people used to keep them as pets here, were the desert foxes, they called them?*

Kit fox, yes. There are two kit foxes really. One lives out on the plains, and one you find around here. They both look alike. One must be a variation of the other, I would suppose. And due there, undoubtedly, to the environment—this is a desert kind of an animal, and [the other] is a broad plains kind of an animal. Yeah, they're here. If it was three or four years ago, I could have shown you a den out between here and Dry Lake. Pick a nice big clump of creosote bush, and

they dig back in there. And they don't usually dig it all by themselves. They're usually aided by another animal, a ground squirrel, that started a burrow of his own and the fox just enlarges it. Or you may find a badger. badgers are still found in this part of the country. They're great diggers, and you just don't get to see them, is all.

The kit fox is a fascinating animal because of its adaptation. All foxes are pretty acutely aware, through sound, of what's going on in the neighborhood. But a kit fox depends upon that for hunting. He can hear the most minute little sound and place it: what it is and where it is, and what it's all about.

But the kit fox adapted in a rather interesting way, too. The first thing, they don't require much water, which is another item. They depend on the liquid in what they eat. Their favorite food in a desert environment is usually one of the rats, and the favorite one of all of them is the kangaroo rat because it's out at night searching for seeds and is easy to locate. Not so easy to catch, though. But a kit fox can pinpoint where that thing is by sound just as well as if he was looking at it almost. A kit fox, unlike other foxes, has a little bit different physical makeup. They all have four legs, but a kit fox's legs are short, a little bit shorter. Why? Because his favorite foods live in the desert, so many of them around blow sand. If he's chasing something and it changes direction on him, with shorter legs he can turn just as quickly. But if he has long legs he'd get all wound up trying to get turned. Not on your life. And his feet, instead of being prominent toes like the other foxes, the foot's kind of broad. Makes a pretty good sand shoe in blow sand. Gives him all kinds of traction. So he has the ability to change direction in a hurry, he has the ability to run on dry sand, anywhere like that. He doesn't depend on soils like the gray fox or the red fox. They live on the slopes. They don't live in blow sand areas. But the kit fox will. So that's why that adaptation—because it can do things the other foxes can't really do. It's a better hunter than the others. They'll get more kangaroo rats and wood rats and small animals like that. And primarily at night. There's something you have to remember about animal life in the desert: most of it is nocturnal. It isn't diurnal. It's mostly out at night you find them.

*I went up to Overton last week where I'd never been before and saw the beautiful greenery growing along the Muddy River down there. And as you said, cottonwoods and willows were still up there. I wondered if that's what the Colorado River looked like down its length before they built the dam.*



The Colorado River has never been a big river. You just go above the lake today and follow the course of the old White River which used to feed the Las Vegas Wash, and the Virgin River, which feeds the lake now from the north. You go right on up the Virgin River and you find it just like it used to be. You could take a look at that and superimpose it, and know very well what [the Colorado River] looked like before.

*It seems a rich ecology that doesn't exist anymore.*

It did at one time. And does yet even above the lake. You go up in there—[the Virgin River] drains out of Zion. I spent three years up in Zion, so I got to see that, trace it up and see where these things took place and the relative abundance of some of these things all along the way.

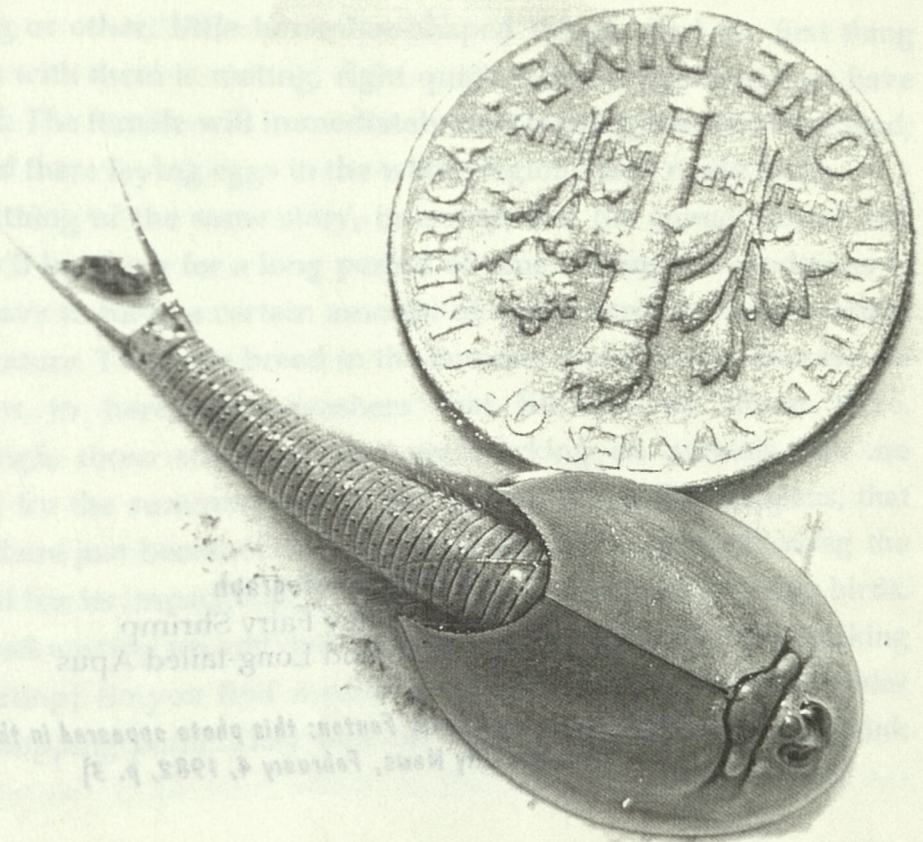
Ecologically, this has been a fascinating region to me because of the impact of development, the fact of the human presence on the conditions that were here before. Very drastic in some ways. In other ways, some species have done real well.

The Indians helped to have a control, or an impact, on the yucca. They were great seed-gatherers, they didn't grow that stuff. They just went out and gathered the seeds and took them in, dried them, and ground them for a meal, a kind of a mush. Along with piñon nuts and things of that nature. They were seed-gatherers, and it wasn't until the people on the plateaus, the Hopis, especially, began to go into farming, and that came up from Mexico. They learned how to grow corn.

*Did you ever have an opportunity to talk with any of the Indians that were still in this area, the Paiutes or Moapas up there?*

No, I never had. In fact, we didn't have that available. You could, if you wanted, go to where they were living, which was on up the river, through Parunuweap Canyon, into the headwaters of the Parunuweap.<sup>62</sup> They were found there all right, not in quantity. They were still known as Paiutes and they lived along the streams. But down south it was Mohave.

*Let's talk about the Fairy Shrimp<sup>63</sup> down on Dry Lake.*



**Top Photograph**

Eldorado Valley and Dry Lake after heavy rain

February 22, 1991

*[photo courtesy of Dennis McBride]*

**Bottom Photograph**

Eldorado Valley Fairy Shrimp  
aka *Notostracans* and Long-tailed Apus

*[photo courtesy of Teddy Fenton; this photo appeared in the  
Boulder City News, February 4, 1982, p. 3]*

that's pretty good stuff, so this becomes a stop-off point for birds, both shore

The Fairy Shrimp is a little crustacean that looks very much like a shrimp, ugly shrimp. But this is also controlled just like the annual flower. In our Dry Lake down here, there used to be a lot of them living there, obviously, and they came in probably from the White River. The White River drainage supplied this region with water at one time. These little creatures are a shallow water breather. They like a muddy area, good muddy flat leading out into the shallow water. They lay eggs. Those eggs are in a sense coated also. Whether it has the same identical coating that the seed has, I'm not sure. But they are definitely coated to some degree. They will lay there where they were buried until water comes in enough to allow them to hatch and produce their own kind. And that's genetic in another sense. What happens when water hits the Dry Lake down here, it forms ponds along the shore. You won't find them way out in the middle. And once it covers this old muddy shore line to a few inches in depth—doesn't take a lot—you find that the eggs have been buried in the previous shoreline, just laying there waiting for the right conditions. And when the right conditions come along, they hatch. They won't hatch until the right conditions *do* come along. If it doesn't, they'll lay there for years and years. But the thing is, just as soon as that condition comes along, they hatch. They look a whole lot like a little horseshoe crab or something or other, little horseshoe-shaped things. And the first thing that ever happens with them is mating, right quick to make sure that they have eggs that are valid. The female will immediately start burying herself in the sand, in the mud around there laying eggs in the whole region. She's ready to die.

They have something of the same story, in a way, that the annual flower has, too, you see. They'll lay there for a long period of time waiting for conditions to be right. [They] have to have a certain amount of water, have to have a certain amount of temperature. They can breed in the summer and often do because we get summer rains in here, gully-washers that fill that up down there. Interestingly enough, those summer rains are working on annuals that are programmed only for the summer, not for the spring. When that happens, that [dry lake] down there just becomes alive with these little buggers all along the shoreline. And that has its impact, too, because it attracts migratory water birds. And they have a ball wading up and down there, avocets, birds like that, picking off those little [shrimp]. So you find a certain value in the Dry Lake for water fowl. It's a good stopping point. They will eat those shrimp. A duck will think

right here, when we first took this place, it had too

that's pretty good stuff, so this becomes a stop-off point for birds, both shore birds and water birds.

When this happens you can expect to find some [of these birds] down there. Maybe not in quantity, but just drifting through. This happens so much of the time, you see, when it's warming up [and] you have migrations. Migratory groups coming through there will stop to get the water because they can't find it just anywhere. And then when they find an abundance of food they'll stay there for quite a little while, usually, eating it up.

But in the meantime, these [fairy shrimp] eggs have been deposited. I don't know how accurate it is—it was published in a reputable science magazine—that down in southern California just where you'd come into Arizona, just off Mexico, there's a region down there where they kept weather records. For fifteen years, I believe the figure was, there'd been no rain measurably that had accumulated in any of those old pond areas. Then it rained, and the whole thing came to life. Kind of startled everybody.

*The city is going to buy Eldorado Valley and turn part of it, I believe, into a desert tortoise habitat. Is that a practical thing to do in your opinion?*

It will be effective, yes. Whether it was required, I'm not so sure. The desert tortoise is widespread. It isn't just here. You even have an area over there on the Arizona border on the California side where you actually have a refuge or a preserve already established because it's so common through that region. They were being decimated there, too—but by a disease.

*It was a respiratory disease?*

Yes. So if you're trying to protect them from the standpoint of intermingling with diseased animals of their own kind, it might prove rather effective, I don't know.

But from a standpoint of food, they can find food almost anywhere in the desert. The desert tortoise is a plant eater and that's that. He can find plenty of things in the desert he likes. Especially, he has a ball when he has a flower show. He's a petal-eater if he can get 'em. You take one of these desert dandelions that doesn't grow much taller than this, see, or a sundrop that grows this big, he'll go for the petals everytime. Right here, when we first took this place,<sup>64</sup> it had too

many dandelions when we tried raising a lawn. But I could take a desert tortoise, find him and bring him in here and turn him loose on this lawn, and he'd just wander around picking off the dandelions. No problem at all. He wasn't frightened of anything in particular, just leave him alone. Soon as he'd see them, you'd see him head for them and chomp off those dandelion heads. He wasn't interested so much in eating the whole plant, but he loved those flower heads.

So I'd want more information, really, as to the reasons why [they want to establish a preserve]. Does that mean that the known range is lessening? If so, what's causing it to shrink? Is it lack of food or what people are doing to it? [The tortoise] isn't food for something else because most other animals alive have no chance at all with a desert tortoise.

You'd have to know, I think, whether the range is receding, and if so, what's the cause of it? If it is receding in an area and the cause you find is because man is overdeveloping a section of it, crowding them out, so to speak, I can understand then picking one spot of several hundred acres where it's a good habitat for them and protecting it, if it's that essential. But a desert tortoise's range is not that restricted. Now, they wouldn't have put these up over near California I'm confident if somebody studying that hadn't felt for sure the range was being restricted and they better pick a good spot here big enough that would give them all their inclusive wants within that range. Because if somebody brings a desert tortoise in they test it to see whether it's carrying a disease. If it doesn't have any disease, they take it and put it in their big preserve where there's plenty of food.

*I read an article in the [Las Vegas] Sun a couple of weeks ago, and I haven't seen anything about it in the Boulder City News, about a wetlands habitat that they're going to build just below the Veteran's Cemetery. Have you heard anything about it?*<sup>65</sup>

We discussed a lot of [that] in regards to Las Vegas Wash. That was fed by water and we didn't want any more monkeying around with it. It had all the vegetation that went with it, you see, through that whole valley. And beaver got into that. So they had quite a fauna and flora in there in that area, and, of course, Lake Las Vegas<sup>66</sup> down there wiped out a big section of that.

But on a national scale [wetlands are] something to think about. Wetlands, oddly enough, are one of the best means of making sure you're going to have pure water to drink. And keep your wildlife up, too. It's a great place for

migratory water fowl, shore birds. And birds that live around the edge of it, perching birds. You usually find a lot of them. You find basically the same thing along the lakes today, where you have vegetation coming along around the lake. Warblers and sparrows, things like that. You go down to Willow Beach in migratory season and you find a lot of birds. Most of them small birds. Sparrows, various kinds of warblers, gnat-catchers.

*Do you have much hope that people in southern Nevada are going to pay closer attention to their ecology?*

I don't know how wise it would be. I think we will for this reason. Las Vegas is dependent upon ecology right now, definitely. There's where they get their water. And water is the ecological task master, literally. If you don't get it, Las Vegas is in trouble. *Real* trouble.

Several years ago when I first retired and came in here, they wanted to make a little study of that water business, and Boulder City was asked to send a representative because we'd be involved in it. I think we had five people. The city of Las Vegas, and the [Clark] county engineer. We looked [at] Las Vegas from the standpoint of water. And I can remember the county engineer, city engineer, on that trip was much impressed with what was there. I remember him saying that you can't sell these people on the dangers to their water supply. He said, "One of these fine mornings they're going to turn the tap and there isn't going to be any water."

Now you see a wild struggle on their hands trying to figure some way of getting more water into Las Vegas. Buy it from other states. Cart it in here if necessary. Even the old, old theory which I heard almost as soon as I got here—working out an arrangement with the states between here and the Columbia River and pipe a lot of the Columbia down here. It's possible. It only has to go through two mountain ranges. I saw in a bank there in Seattle a working model that was built to show how that may be done. You'd only have to lift the water twice, and you had power from the Bonneville [Dam]<sup>67</sup> and some of those other places like that to take care of all the pumps. And I notice that the powers down here talking about water haven't discarded that idea yet. They recognize it would cost quite a bit of money and maintenance and everything. But I read [something] a short time ago from one of the town council [meetings] in Las Vegas pointing out that if you could build a pipeline from one side of the Arctic to the other and put oil through that thing, surely it wouldn't be any bigger

project to build a pipeline from the Columbia down to Las Vegas. And that's about right.

*I wonder what that would do to the Columbia River, though, and the downstream areas.*

That's after water's already passed all their water needs.

*Do you think that this is a wise idea? Not a necessary one, but a wise one?*

I don't know how wise it would be. It's feasible, let's put it that way. If they feel that the future of Las Vegas and southern Nevada are contingent upon more water, they have to have it, and this is the only way they can get the supplies, then it would make sense, if they had the money to pay for it. Right now they're trying to buy water, you know, from two or three mining companies up the Colorado. These mining companies would be paid to not use so much water, so many second feet.<sup>68</sup> And that would increase the number of second feet Las Vegas is supposed to be able to take out of Lake Mead. Any old way to get it. And they've worked out a detailed plan—maybe you've seen it—to buy water from Arizona that's used now for irrigation down in southern Arizona. The farmers don't need that much, it's pointed out. They don't use it, so why not buy that and bypass it down into Lake [Mead].

I've been interested in that, looking at all conceivable angles to build up the water supply.

*Isn't it possible that Las Vegas may just reach a point of critical mass and there simply won't be a solution?*

I don't think there's any doubt of that. Not only just from water, but from sheer mass [of people] living in an area where you have to cart everything in in order to live. I can imagine traffic. Traffic's bad right now for trucks to bring everything in. Suppose we build up another million like this past million. At the rate they're coming in, three or four thousand a month, why, they could build up a lot of people there in a short time.

I'm more interested in the ecology of it, I guess. I can see that the altering of an environment can just raise havoc with what's there or anything you put in it. You alter too much, you pass a point of no return, and there you've had it.



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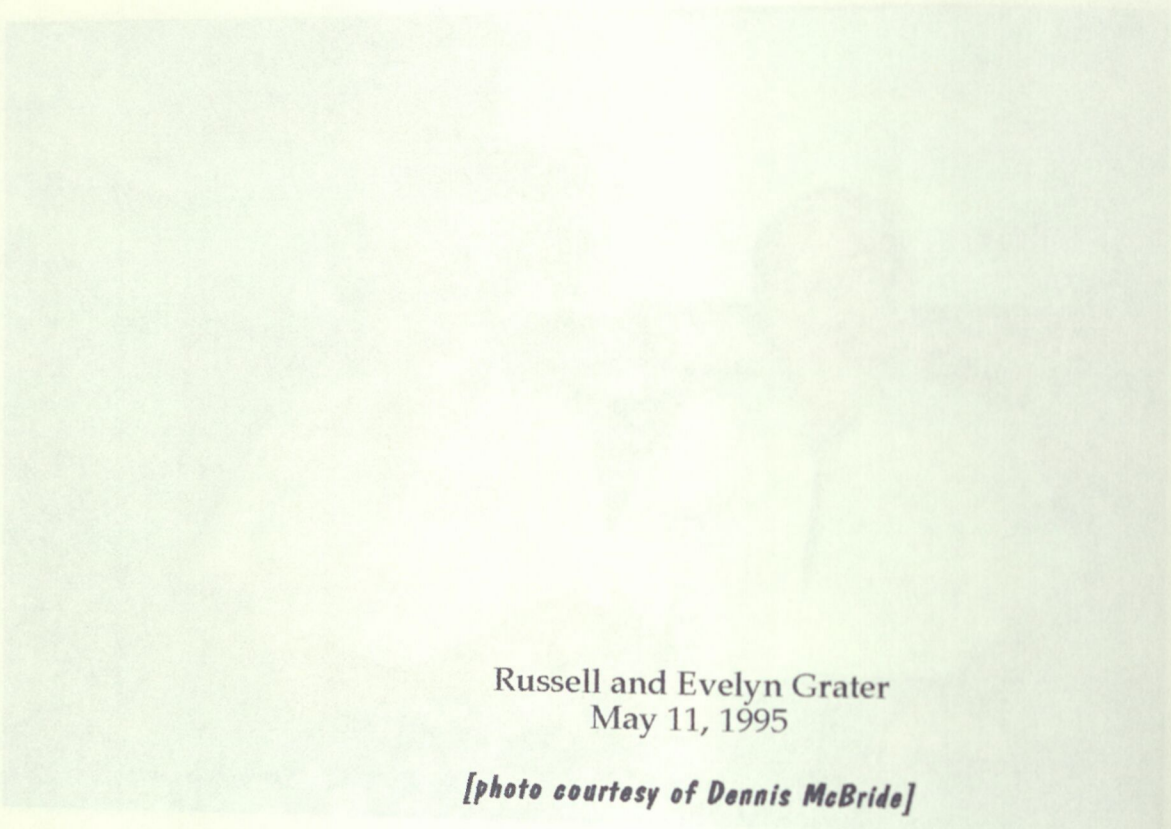


15. Mt. Rainier National Park

16. Glacier National Park and  
the northwest corner of  
provinces of British Columbia

17. The Rocky Mountain National

18. Passed by Congress and  
Economy Act was issued  
Roosevelt's New Deal program  
the Economy Act of 1933



Russell and Evelyn Grater  
May 11, 1995

*[photo courtesy of Dennis McBride]*

## NOTES

1. Harley R. Grater
2. Clyde Grater
3. Byron Grater
4. Lura Grater.
5. Lebanon is located several miles northwest of Indianapolis on Interstate Highway 65.
6. Crawfordsville is a college town located west of Indianapolis near the junction of U. S. Highways 136 and 32.
7. This was Turkey Run State Park.
8. Yellowstone National Park is in Wyoming.
9. Yosemite National Park is in California.
10. Grand Canyon National Park is in Arizona.
11. Sequoia National Park is in California.
12. Mt. Lassen Volcanic National Park is in California.
13. Mr. Grater's wife, Evelyn Proffitt
14. Crater Lake National Park is in Oregon.
15. Mt. Rainier National Park is in Washington.
16. Glacier National Park and the Waterton-Glacier International Peace Park is in the northwest corner of Montana. It crosses the border into the Canadian provinces of British Columbia and Alberta.
17. The Rocky Mountain National Park is in Colorado.
18. Passed by Congress and signed on March 20, 1933 by Franklin Roosevelt, the Economy Act was meant to cut government expenditures. However, because Roosevelt's New Deal program required such extraordinary expenditures, the Economy Act of 1933 was essentially meaningless.

19. Yavapai Point is on the south rim of the Grand Canyon.
20. George Wright was a ranger naturalist at Yosemite National Park who initiated the first program to survey the fauna of the national parks. An independently wealthy man, Wright took a two-year leave of absence and with his own money opened and staffed an office in Berkeley, California to conduct wildlife surveys. Wright's work set a precedent for having scientific studies conducted in national parks by National Park Service scientists. In 1932 Congress provided \$22,500 to continue the surveys, and Wright's Berkeley office was formally established as the National Park Service's Wildlife Division. Wright was killed in an auto accident in Big Bend National Park early in 1936.
21. Chester R. Longwell [1887 - 1975] wrote extensively on the geology of southern Nevada, beginning his field work there in 1919. Among his best-known publications are *Geology and Mineral Deposits of Clark County, Nevada* [Nevada Bureau of Mineral Geology, Bulletin 62, 1965]; *Geology of the Muddy Mountains, Nevada* [New Haven: Yale University, 1921]; and *Reconnaissance Geology Between Lake Mead and Davis Dam, Arizona/Nevada* [Washington, D. C.: GPO, 1963]. See pages 31-33 for a description of Longwell as Mr. Grater's teacher at Yale.
22. Grand Teton National Park is in Wyoming, just south of Yellowstone National Park.
23. Zion National Park is in Utah.
24. The United States dropped an atomic bomb on the Japanese city of Hiroshima on August 6, 1945. On August 9, a second nuclear bomb was dropped on Nagasaki. On August 10, the Japanese government accepted unconditional surrender, and V-J day was officially declared on September 2.
25. Bryce Canyon National Park is in Utah.
26. When he retired to Nevada Mr. Grater worked briefly for the Nevada State Parks Division, traveling from park to park assessing their naturalist programs.
27. These two books are *Flowering Plants of the Lake Mead Region* [Globe, Arizona: Southwest Parks and Monuments Association, 1977] and *Snakes, Lizards & Turtles of the Lake Mead Region* [Globe, Arizona: Southwest Parks and Monuments Association, 1981].
28. This is the *Interpreter's Handbook* [Globe, Arizona (?): Southwest Parks and Monuments Association, 1976].
29. In October 1994 the 103rd Congress passed the *California Desert Protection Act*, which set aside 7.5 million acres of fragile desert land for protection. The Act created the 1.4-million-acre Mojave National Preserve and 70 other

wilderness areas. It also promoted the Death Valley and Joshua Tree National Monuments to full national park status.

30. This area now is the Organ Pipe Cactus National Monument in southern Arizona on the border with Mexico.
31. Boulder City was home to two companies of the Civilian Conservation Corps: Companies 2536 and 573. Co. 2536 arrived in Boulder City on November 10, 1935 and Co. 573 arrived on January 15, 1936. The companies occupied abandoned Six Companies dormitories nos. 6, 7, and 8. These buildings were located on the blocks which today are bounded by New Mexico Street, Avenue B, Fifth Street, and the Nevada Highway. Avenue A bisects this site. Co. 573 was disbanded November 20, 1941, while Co. 2536 was disbanded by the end of June 1942.
32. The Lost City Museum in Overton, Nevada, was built by Civilian Conservation Corps enrollees in 1934-35. The museum was built of adobe brick in pueblo style.
33. Nevada's Lost City pueblo ruins [also known as the Pueblo Grande de Nevada] were discovered in 1924 along the Muddy River above the Mormon farming community of St. Thomas near the Colorado River. The ruins were first excavated in 1924-26 by noted archeologist Mark Harrington. The work was abandoned when funding ran out in 1926. When it was clear that the ancient site would be flooded by the rising Lake Mead, Harrington returned to continue excavations in 1933 with Civilian Conservation Corps enrollees. Excavations continued until the area was finally inundated in 1938.
34. The Valley of Fire State Park is near Overton, Nevada.
35. Rogers Spring is a natural hot spring at the foot of the Muddy Mountains on the north shore of Lake Mead. The small fish to which Mr. Grater refers is the speckled dace.
36. The White River is a "fossil" river system which at one time fed the Colorado River. Remnants of the White River system exist today as springs along the old channel below the eastern slopes of the White Pine Range in White Pine County, Nevada; springs in the Pahrnagat Valley of Lincoln County; and in the prolific springs of Warm Springs Valley which are the source of the Muddy [aka Moapa] River, which feeds into the Overton Arm of Lake Mead. An eastern fork of the ancient White River today is known as the Meadow Valley Wash. There is a small flow here which joins the Moapa River near Glendale, Nevada. [See *Fishes and Fisheries of Nevada* by Ira La Rivers (Reno, Nevada: University of Nevada Press, 1994), pp. 107-110.]
37. Pierce's Ferry, one mile below the mouth of the Grand Canyon at Colorado River mile 279.5, is named for Harrison Pearce, who operated a ferry at this

spot from 1876 to 1883. The ferry was used by Mormons moving to Arizona from Utah. The spelling of Pearce's name has been altered from the original.

38. Willow Beach, also known as Pebble Beach, is a fishing resort located twelve miles downstream from Hoover Dam on the Colorado River.
39. Refer to the Boulder City Library Oral History Project interview with Therese Courture Thomas [March 13, 1995], p. 42.
40. Incorporated in Nevada on June 6, 1936, Grand Canyon-Boulder Dam Tours signed an exclusive contract with the National Park Service on May 13, 1937 to serve as the sole concessionaire within the Lake Mead National Recreation Area. [See "Grand Canyon-Boulder Dam Tours, Inc.: Southern Nevada's First Venture into Commercial Tourism," by Dennis McBride in the *Nevada Historical Society Quarterly*, v. 27:2 (Summer 1984), pp. 92-108.]
41. Separation Canyon [aka Separation Rapid], in the lower Grand Canyon, is the point at which three members of John Wesley Powell's 1869 expedition down the Green and Colorado Rivers left the party on August 28. Seneca Howland, William Howland, and O. G. Dunn climbed to the north rim of the canyon and were killed by Indians.
42. This is the Overton Arm of Lake Mead.
43. This article is titled, "Prehistoric Trading Post," published in *Arizona Highways*, volume 30, no. 10 [October 1954], pp. 34-39 [included in this oral history in "Selected Publications"].
44. Lake Mohave was formed when Davis Dam was built on the Colorado River below Hoover Dam in 1949.
45. The National Park Service warehouse, located in the Lakeview area of Boulder City at the foot of Colorado Street, was formerly the machine shop for the Six Companies, the contractor that built Hoover Dam.
46. The Gold Strike Inn is a gambling resort and hotel built on the former Sullivan Claim five miles from Boulder City on U. S. Highway 93. The resort is completely surrounded by the Lake Mead National Recreation Area. There are several ancient turquoise mines, or pits, in the vicinity.
47. This is Hemenway Valley, also known as Hemenway Wash, on the west side of Boulder City leading down to Lake Mead.
48. Dry Lake is located in the Eldorado Valley southwest of Boulder City along U. S. Highway 95.
49. In 1936 the National Park Service took over and remodeled the Six Companies hospital in Boulder City [see note 44 for the Six Companies]. The

building served as the Service's administrative headquarters and museum until World War II.

50. Camp Williston, originally known as Camp Sibert [the name was changed on September 30, 1942], on the southern outskirts of Boulder City, was occupied on April 11, 1941. A training facility for military police, Camp Williston was abandoned on April 30, 1944.
51. The Park Service built two small tourist checking stations at both entrances to the Lake Mead National Recreation Area: one at the west entrance of Boulder City, and the other on the Arizona side of Hoover Dam. Put into operation on April 1, 1937, the stations were manned by Civilian Conservation Corps enrollees.
52. The Red Mountain Hiking Trail was built by enrollees of Boulder City's CCC Company 573 in 1937-38. This trail was built entirely by hand, reinforced with native rock, provided with drainage culverts and was made three feet wide to accommodate horses. The trail also accommodated the desert big horn sheep who live in the River Mountains. About halfway up the mountain, the trail passes through a forest of miniature desert fir trees, none of them over three feet tall. The trail ends on the east peak of Red Mountain, 3,650 feet above sea level. This trail has been repaired and re-dedicated.
53. See "New Kid in Town" in the *Boulder City News* for February 4, 1993, p. 7.
54. St. Thomas, Nevada was a Mormon farming community founded in 1865 near the confluence of the Virgin and Muddy Rivers in the lower end of the Moapa Valley. It was abandoned and completely inundated by Lake Mead in 1938.
55. Evidently this happened more than once. For information on an earlier incident, see "King of Island in Lake Mead is Assassinated," in the *Reclamation Era*, May 1936, 113:1-2 [reprinted in the *Boulder City News* on March 25, 1976, 16:5-8].
56. See note 21.
57. Fortification Mountain [aka Hill] is a basalt formation on the southeast side of Lake Mead above Kingman Wash.
58. A talus is a slope of rocky debris at the base of a cliff or at the mouth of a dry wash.
59. Commencing in February 1988, this fault produced a series of small tremors for several months.
60. The U. S. Coast and Geodetic Survey [USGS] had been established in Boulder City, with offices in the basement of the Municipal Building, as early as 1938. Seismographs were installed in the basement of the Bureau of Reclamation

Administration Building in Boulder City, at Pierce's Ferry, in Overton, Nevada, and eventually in Searchlight, Nevada. In May and June 1942 a permanent, state-of-the-art seismograph replaced the temporary station in the basement of the administration building. On October 2, 1952, it was announced that the USGS would be phased out of Boulder City, and its offices were moved into a demountable house on Date Street. Use of the four seismographs in the area was curtailed or abandoned, and the USGS left Boulder City in August 1955.

61. See note 20.
62. Parunuweap Canyon is in Zion National Park, Utah. The East Fork of the Virgin River flows through here.
63. *Notostracans*, also known as the Long-tailed Apus.
64. 1102 Arapaho Place in Boulder City, Nevada
65. See the *Las Vegas Sun* for March 14, 1995, 6B.
66. Construction on Lake Las Vegas in Henderson, Nevada was begun in June 1989 by land developers who dammed the Las Vegas Wash to produce a body of water around which to build custom homes, gambling resorts, and hotels. The concept was first proposed by developer J. Carlton Adair in 1961. Lake Las Vegas borders the Lake Mead National Recreation Area, and most of the Las Vegas Wash wetlands area was destroyed to produce it.
67. The Bonneville Dam stands across the Columbia River between Washington and Oregon several miles east of Portland.
68. Cubic feet per second [cfs]

\* \* \* \*

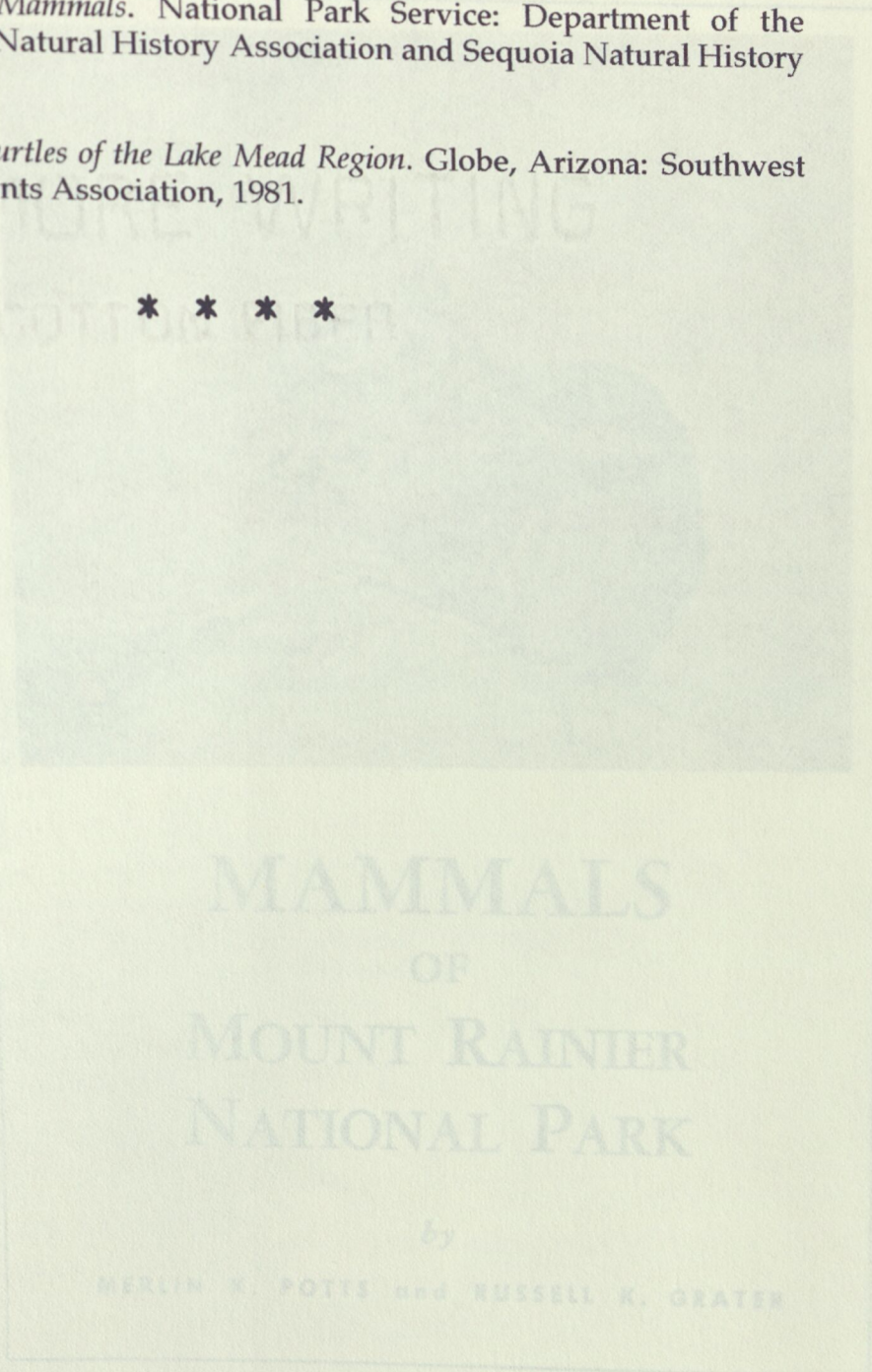


## Russell Grater: Selected Bibliography

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\* \* \* \*





MAMMALS  
OF  
MOUNT RAINIER  
NATIONAL PARK

*by*

MERLIN K. POTTS and RUSSELL K. GRATER

ARIZONA  
HIGHWAYS

OCTOBER • 1954  
THIRTY-FIVE CENTS



# ARIZONA HIGHWAYS

Vol. XXX No. 10 October 1954

RAYMOND CARLSON, Editor  
GEORGE M. AVEY, Art Editor

## LEGEND

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HOWARD PYLE  
*Governor of Arizona*

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FRONT COVER  
"EASTER LILY CACTUS" BY R. C. AND CLAIRE MEYER PROCTOR. This reproduction appears in McGraw-Hill's new book *The Flowering Cactus*, reviewed elsewhere in these pages. The cactus plant shown here, *Echinopsis multiplex*, is found in cultivation in the U. S.

OPPOSITE PAGE  
"CHINO VALLEY" BY CARLOS ELMER. Chino Valley is a garden spot north of Prescott on U. S. 89. 4x5 Burke and James Press camera, 6-inch Goerz Aerostar lens, f.14, 1/10th second, Ektachrome. Green fields, brown hills, billowing clouds appealed to the photographer.

## WHAT'S NEW UNDER THE *Arizona* SUN

NEW MAP IN THE SUN: The Arizona Highway Department's official 1954-55 highway map is now ready for distribution. Produced by this department, the map is the largest and, we think, the best we have ever issued. One new feature consists of an abbreviated but accurate map of Mexico's west coast all the way from Nogales to Guadalajara which should be of considerable help to travelers this winter down the new highway south into Mañanaland. This

new map is available free of charge to readers of these pages. Write to ARIZONA HIGHWAYS, Phoenix, Arizona.

DOINGS IN THE SUN: Generally the first week of October finds the autumn season in loveliest colors at elevations above 6,500 feet. Habitual autumn color watchers cite the days between October 25 and November 5 as the best time to see the golden season in Oak Creek Canyon area and at elevations around 3,500 feet. November starts the busy-season in the southern part of our state. Nov. 5-14, the annual Arizona State Fair in Phoenix takes the stage, when the whole state puts a well-groomed foot forward. Nov. 12-13-14, Tombstone stages the Hellsdorado, when a wild and whoopey western town, maybe not so wild and whoopey as once upon a time but still real western, relives a boisterous youth. Nov. 27-28, the 26th annual Junior Parade, Florence. Teen age youngsters show quite mature skills in displaying the lively arts of the rodeo. Always a good show.

## Ode to the Air-Minded

As befits a modern town in this modern age, Phoenix, Arizona's capital city, is extremely air-minded. An important terminal in the air lanes of the world, Sky Harbor of Phoenix is a place to please the visitor whether his demand be beauty or utility. Also, as befits a Western city whose accent is on hospitality, Sky Harbor is a friendly haven for the air traveler that cannot fail to leave lasting and pleasant impressions.

To many, many thousands of people each year, Sky Harbor is a swinging door of welcome to Arizona and the Southwest. Few cities in the United States, regardless of population, have such gracious and charming facilities to greet those who come winging in out of the wild blue yonder. If we sound a trifle enthusiastic, please do not misunderstand; we are. And if you would like to know more about Sky Harbor, we invite your attention to a feature on the subject elsewhere herein.

Otherwise we are also concerned (this month) with a review of a book which has been of great consideration to the editorial staff of this publication and to two of our faithful contributors for a long time; with the workings of that splendid organization, Future Farmers of America, Arizona style; with lizards, a prehistoric ruin, and with how exciting the Arizona landscape can be.

. . . R.C.

### COLOR CLASSICS FROM ARIZONA HIGHWAYS

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*Prehistoric*  
**TRADING  
POST**

*A necklace, made of  
bone beads, abalone shell  
pendants, was found in  
a Pueblo river burial.*

BY RUSSELL K. GRATER  
PHOTOGRAPHS BY THE AUTHOR

Suppose, as superstitious people sometimes insist, ghosts of the departed come back at the end of each thousand years to their previous haunts and relive for a brief few hours happenings that took place long ago. Suppose you had the opportunity to sit and watch this ghostly company as they reenacted the events of their day—events soon to be buried in the pages of time. Suppose—but let's allow our imaginations to turn back these almost lost pages of a thousand years ago and see for ourselves what happened. Almost any spot on the map that we might wish to touch would unfold an exciting story, but let's visit one area that seems very remote, yet at one time experienced some of the most fascinating happenings to take place anywhere in the Southwest—let's go to Willow Beach on the Arizona side of the Colorado River in the midst of dark, but scenic, Black Canyon.

The year is around 954 A.D. Along the bank of the river, on a flat bench only a few feet above the water, groups of Indians are gathered in the shade of broad-topped cottonwood trees enjoying the warm spring day. Tall, muscular

Amacavas (probably the ancestors of present day Mohave Indians) mingled with short, powerfully built Pueblo-like people from the Overton, Nevada, area, and exchanged stories of their experiences. Today was the last day they would be together until fall. Today marked the end of another journey to this spot on the Colorado, during which each group brought forth its trade goods for exchange. Extensive bartering was now over, and here and there new owners looked over their recently acquired "bargains." In the shade of a mesquite tree, a Pueblo woman examined with delight some delicately tinted abalone shells—until recently lying along the shores of the Pacific Ocean far to the westward. Equally pleased was her husband with his newly acquired wealth of olivella shells, also from the Pacific. A short distance away, an Amacava woman sat contentedly with her child, while near her were two beautifully decorated bowls that she had obtained through bartering with her Pueblo neighbors from the northern valleys.

Although the Indians were not very active, preferring the shade as they talked, there was an atmosphere of expect-

tancy. Earlier that morning experienced hunters had gone out to try to obtain a bighorn or two for the feast scheduled for that night. This, also, would be the last opportunity for months to enjoy a friendly meal together. Possibly they might even be joined by the Cerbat people from the mountain country to the eastward, as some of them had stayed over another day before returning home. Of course, there had been one sad note, but it was not expected to adversely affect the prospects for a lively evening. Little Tina, a young Puebloan girl from the red valley to the north, had suddenly taken ill and died. What caused it no one knew. After proper ceremony, the grieving parents and friends had buried her and her belongings in the sand a short distance away from where the main camp was located.

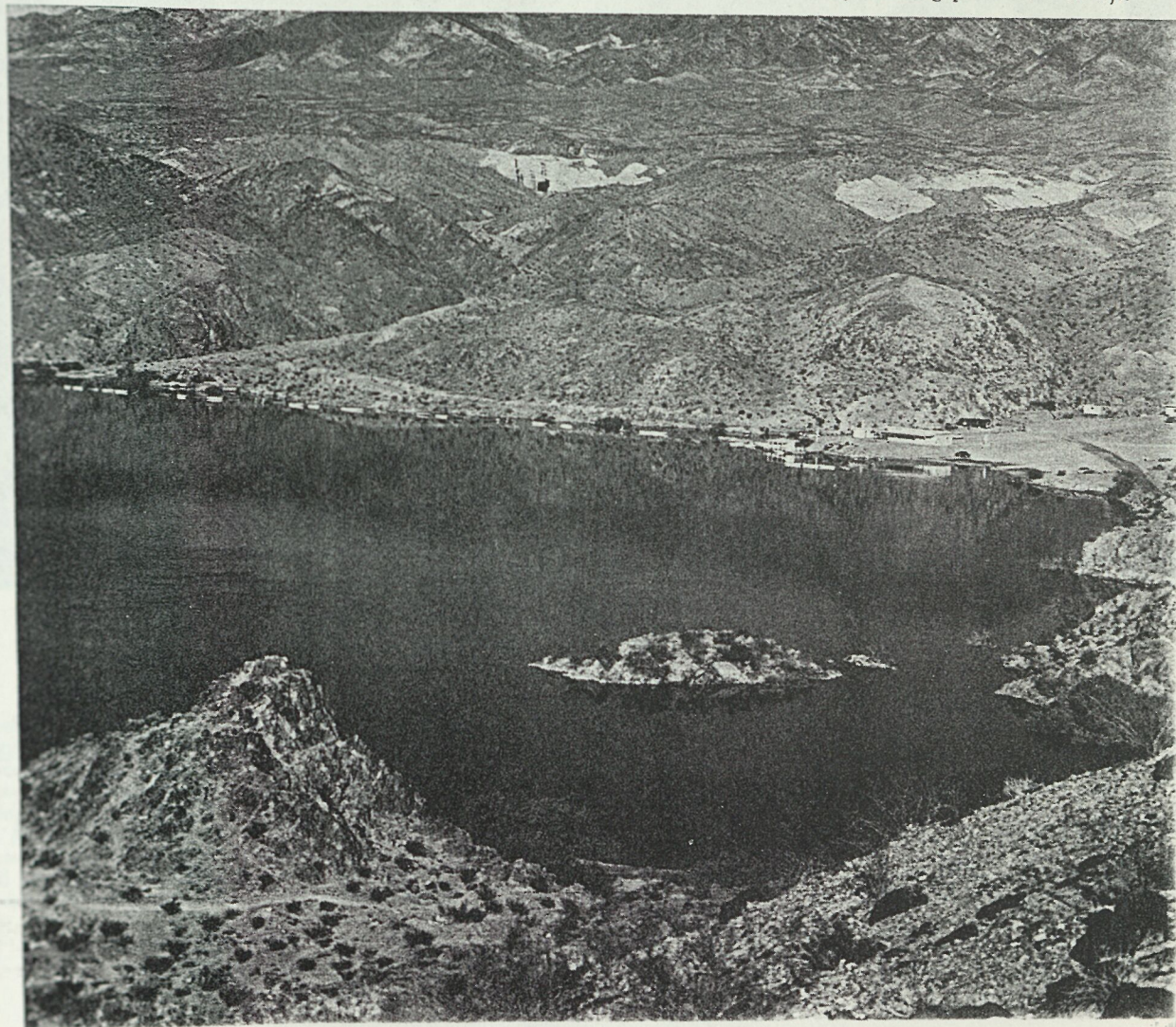
But now let's come back to present-day reality. It's all well and good to tell about such things, and it certainly does stimulate the imagination trying to visualize the scene and the events. But what proof do we have that anything of this sort actually happened—or that any part of it took place? Well, of course, we can't say for sure just what all

did happen, but let's go over the evidence and put together the story of this prehistoric trading post as the archeologists uncovered it during their excavations of the site.

Almost 800 years went by between the time the site was last used as a trading area and the year 1934, when the first excavations at Willow Beach were made under the direction of M. R. Harrington of the Southwest Museum. While his work at the site was not extensive, more than 900 Indian artifacts were dug out of the low sandy hill above the Colorado River. Following this initial work, there was nothing more done until in 1947-48, when investigations by Archeologist Gordon C. Baldwin of the National Park Service were begun in the area, prior to the construction of Davis Dam and the formation of new Lake Mohave. These studies were completed by Archeologist Albert H. Schroeder during the final National Park Service excavations of the site in 1950.

Just what was found during these excavations? To begin with, the site was found to be quite ancient. Here were found evidences of the Basket Makers—short, stocky

*From the terrace above the public campground, Willow Beach area is seen in its entirety. Trading post area is on left.*





*Black Canyon, near the prehistoric trading post site, is very scenic and a delight to*

*photogr*

Indians who have since become famous in the field of archeology for their finely woven baskets, which were so often placed over the bodies of their dead when buried. These people had found the Virgin River Valley much to their liking, and had developed extensive settlements in that area. As hunter-farmers, they had learned to grow corn to supplement their diet of wild game and seeds, and had developed rather crude houses. Occasionally some of them drifted southward into the Willow Beach area, there to hunt

and enjoy the mild winter months. This they continued to do until around 750 A.D.

Far down in the sand deposit, actually 7 feet 7 inches below the surface, a beautifully shaped stone point was discovered more than three inches in length. This was a valuable find as it turned out to be an Amargosa spear point. Now the Amargosa people are somewhat shadowy figures of the past. Apparently they came to this region from the Amargosa Desert near Death Valley. When they came into

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photographers.

the Willow Beach country would be difficult to estimate, but apparently long before the birth of Christ. Also, it isn't possible to say how long they lived here, or whether they actually stayed over extensive periods of time. It could be that they only visited this region upon occasion. There is evidence that they met, and perhaps traded with, the Basket Maker people here at this site. Where did they go? There, also, information is lacking. Thus, they simply remain an open question with little in the form of an answer.

Although little is known about the Amargosa people, there is considerable information about the next people who came to this secluded spot along the Colorado. Sometime after 750 A.D., the western region of the present Lake Mead area really developed into a beehive of activity. From the earlier Basket Maker culture, there arose a Pueblo-like group of Indians. These built extensive settlements along the Virgin River Valley. Farmers, and good pottery makers, they continued to make good use of established trade contacts with other Indian groups at Willow Beach. East of the Colorado River lived another tribe in the mountains north of present-day Kingman. These were the Cerbats (a Cocomaricopa word meaning "mountain sheep")—from whom the Cerbat Mountains received their name—and it is thought the ancestral stock which gave rise to the modern Hualpai Indians. Both of these groups left evidence of their visits to Willow Beach prior to 900 A.D. At this date, another people, the Amacava, came out of the Mohave Desert region and entered the Black Canyon country. They frequented the Willow Beach site up to 1150 A.D., during which time the Pueblo and Cerbat peoples came to barter. These three groups had much in common. They were peaceful, and they quite evidently enjoyed getting together and trading with each other.

Just when these big trading sessions first began is difficult to say, but Willow Beach is known to have become the center of this activity. If there were such things as proprietors of this prehistoric trading post that now developed, then they were the Amacavas. These Indians were great travelers and traded over a wide area. From California they brought in steatite beads, asphaltum, abalone and olivella shells, the latter much prized for ornaments and possibly indicating wealth. All of these items were found in considerable quantity during the Willow Beach excavations. One can only speculate on how many of these articles were actually brought into the region, but they must have been numerous. Certainly for every one found in the sand hill, there must have been a hundred taken away, as similar material in the Virgin River area suggests.

There was much evidence that the Puebloans from around the Moapa Valley came regularly to this spot. Not only were numerous items of their pottery uncovered, but there were several burials. All of these could be readily identified as being Puebloan, as they were buried in the typical "flexed" position with their heads facing a southerly direction and their knees drawn up against their stomachs. One of these burials was that of a child, and with her had been placed a large quantity of olivella shells. These had apparently been a necklace or decorations on a garment of some type. In all, there were 835 of the shells. Another burial of unusual interest was that of a middle-aged man, because by his side was the skeleton of a dog. Apparently his faithful companion had been buried with him to keep him company. In all, there was a total of eight bodies uncovered during the excavations, all Puebloans. All appeared to have died a natural, peaceful death, as no signs of violence were found.

Likely the Cerbats did not visit the site very often. While there were several pieces of Cerbat pottery found during the excavations, these were small in number compared to the wealth of items left by the other two Indian groups.

Some idea of the life of the day can be obtained from other materials unearthed from the sand terrace. That there were many large game animals in the region was evident from bones found in fire pits some distance beneath the



*Water from the rising lake is eating into the sands covering prehistoric trading post site.*

surface. Mountain sheep bones were fairly common. Apparently after the animal had been cooked, the bones were split and the marrow eaten. Then the bones were thrown into the fire or were tossed away, later to be covered over by drifting grains of sand. Deer bones showed up a few times, while bird and fish bones were occasionally found. It was not necessary for the Indians to search very far for firewood, as during high water the river brought considerable quantities down stream from the plateau country to the eastward. Charcoal taken from the roasting pits proved to be of cottonwood, pine, Douglas fir and some juniper.

Putting all of the information together that was uncovered during the excavations, it is possible to reconstruct a scene such as was described above. Perhaps the scene as pictured isn't entirely accurate—possibly some of these events took place at different times—but they very likely did occur. It is also possible to estimate when in history these get-togethers took place and when they ended. Apparently they went on with some regularity for long periods of time until around 1150 A.D. Some time after this date there occurred an influx of another Indian group from the north. These new people appear to have been Shoshoneans, ancestors of the Paiutes. Their arrival saw the end of the Puebloan occupation of the Virgin River country. It would appear that the Shoshoneans were far from friendly, since the Puebloans apparently decided the region wasn't worth the effort necessary to defend it. In any event, they deserted the Virgin River area and moved eastward toward the Four Corners region, leaving southern Nevada to the Paiutes and Amacavas. That these newcomers visited the trading area at Willow Beach is shown by small quantities of their pottery and worked stone points, as well as the remains of a

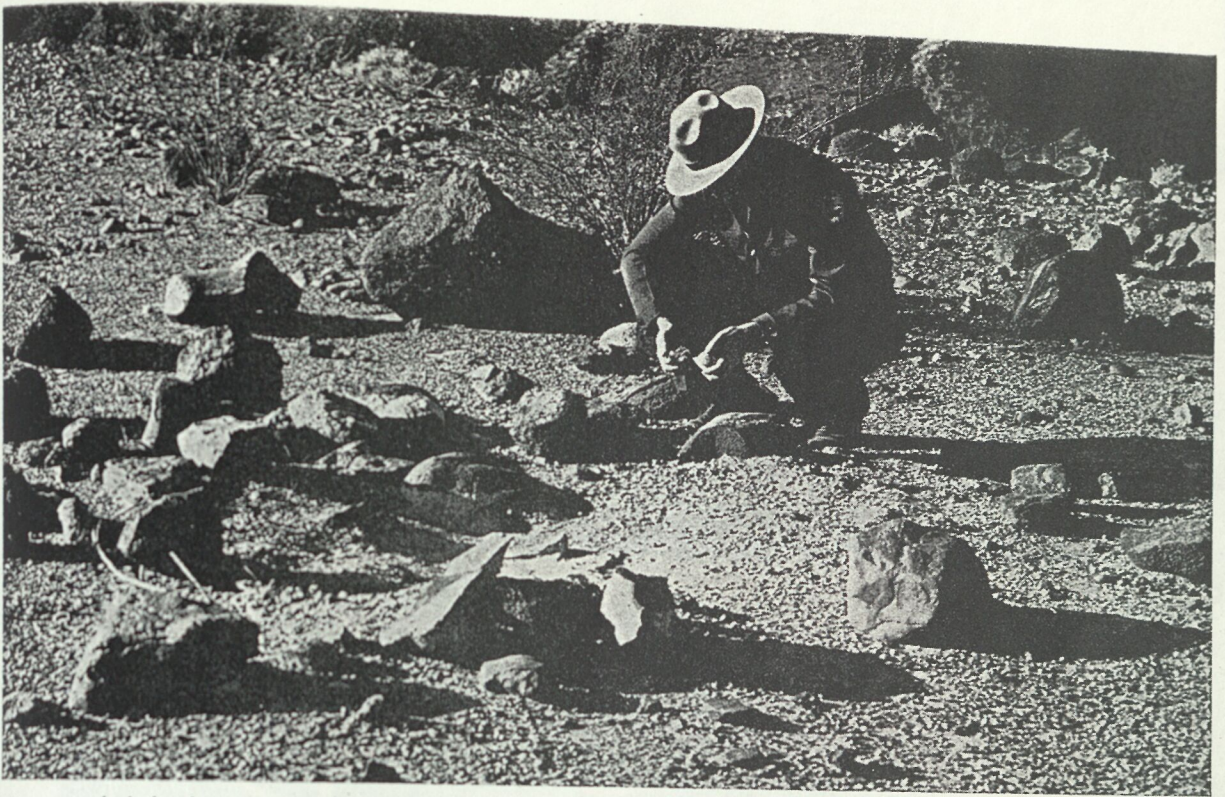
circular brush shelter found in the surface layers at the site. Also there are a number of petroglyphs on the cliffs only a short distance from the site that appear to be Shoshonean in origin, while the hills immediately above show evidences of old camp sites. Apparently the Shoshonean people and the Amacava did not get along too well, and the Amacava withdrew down the river to the southward, taking up residence along the river valley near present-day Needles. The ancestral Paiutes stayed pretty much in the region from Willow Beach northward, and in the Mohave Desert region, while the Cerbats remained in their mountain and plateau

*This Amargosa spear point was found 8 feet underground.*



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*A circle of stones on a terrace above the public campground marks the site of an old camping area.*

stronghold to the eastward, where they avoided neighbors.

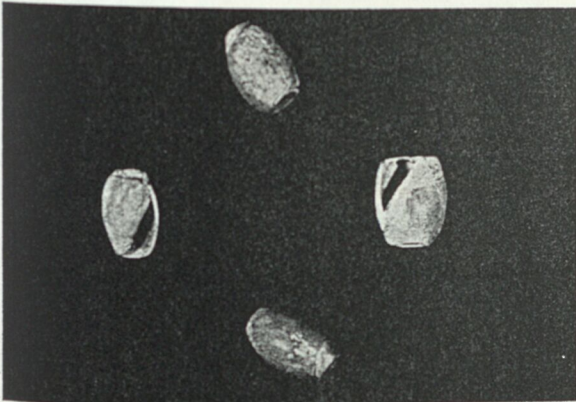
Thus, after approximately 400 years of activity, featured by peace and good will between these primitive peoples, the ancient trading post at Willow Beach closed its doors, not to be reopened until the shovel and trowel of the archeologist accomplished the feat hundreds of years later.

When you visit the area today, you will find only surface traces of the story. However, the old trading post isn't difficult to find. Simply go to the Willow Beach Cafe, leave your car and follow on up Lake Mohave via an old road that stays a short distance above the water. After crossing a large

wash, begin to watch the sandy slopes between you and the lake and you will soon see signs of where digging has taken place. This is the spot, and on the surface you will see numerous small pieces of pottery, and occasionally pieces of worked stone points. The site will likely be partially flooded by the new lake. The setting is scenic and very picturesque, so spend a few minutes letting your imagination reach back a thousand years to the time when a muddy river flowed through the canyon, and cottonwood and mesquite trees lined the banks and choked the washes. Before leaving the Willow Beach area, go over to the public campground and walk down to the lake shore. Just as you reach the water, look at the steep cliff rising near at hand on the downstream side of the cove. If your eyes are sharp, you will see a number of petroglyphs pecked into the dark rocks by Indians, likely placed there by some brown-skinned artist several hundred years ago. Just as time once erased the shape of the old trading post and buried it beneath the sands of the Colorado River, so are the petroglyphs slowly fading away under the forces of Nature. If you care to get a bit of exercise, walk down-lake along the well-worn trail leading from the campground. Watch closely and you will find a mortar hole right by the trail where seeds were once ground into fine meal, while petroglyphs may be seen on the black boulders nearby. Now climb the hill above you to the southward, and on its flat top you will find a number of rocks lying in circular patterns—camp sites of these ancient people.

Shifting winds are again blowing sand over the spot where these early-day people lived and traded, while the waves of Lake Mohave are eating away at the site. In a brief few years, all traces of the old trading post will be gone, and the ancient site will once more fade into the past.

*Olivella shells from Pacific were found in excavation.*

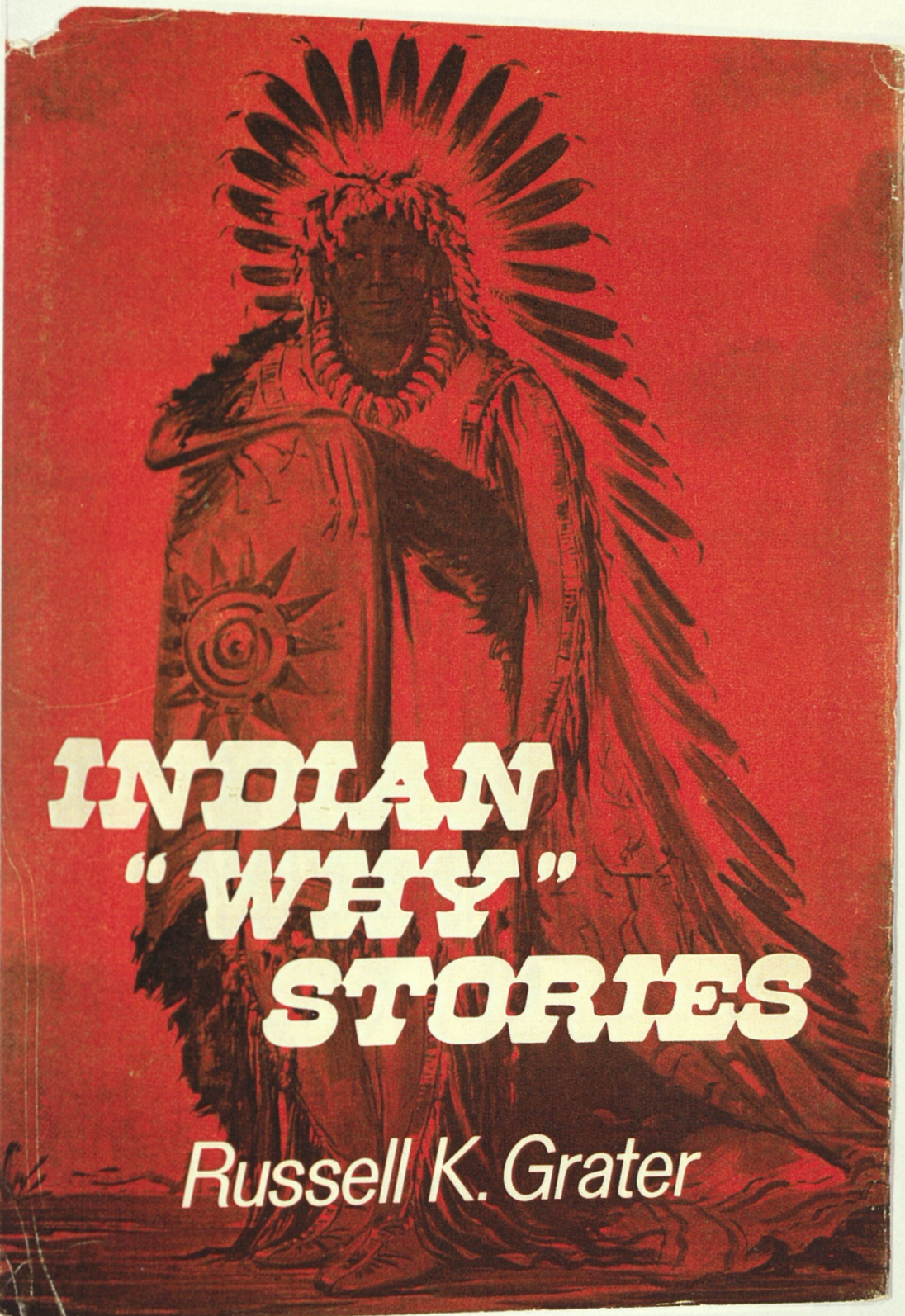


# THE INTERPRETER'S HANDBOOK



**METHODS, SKILLS, & TECHNIQUES**

**RUSSELL K. GRATER**

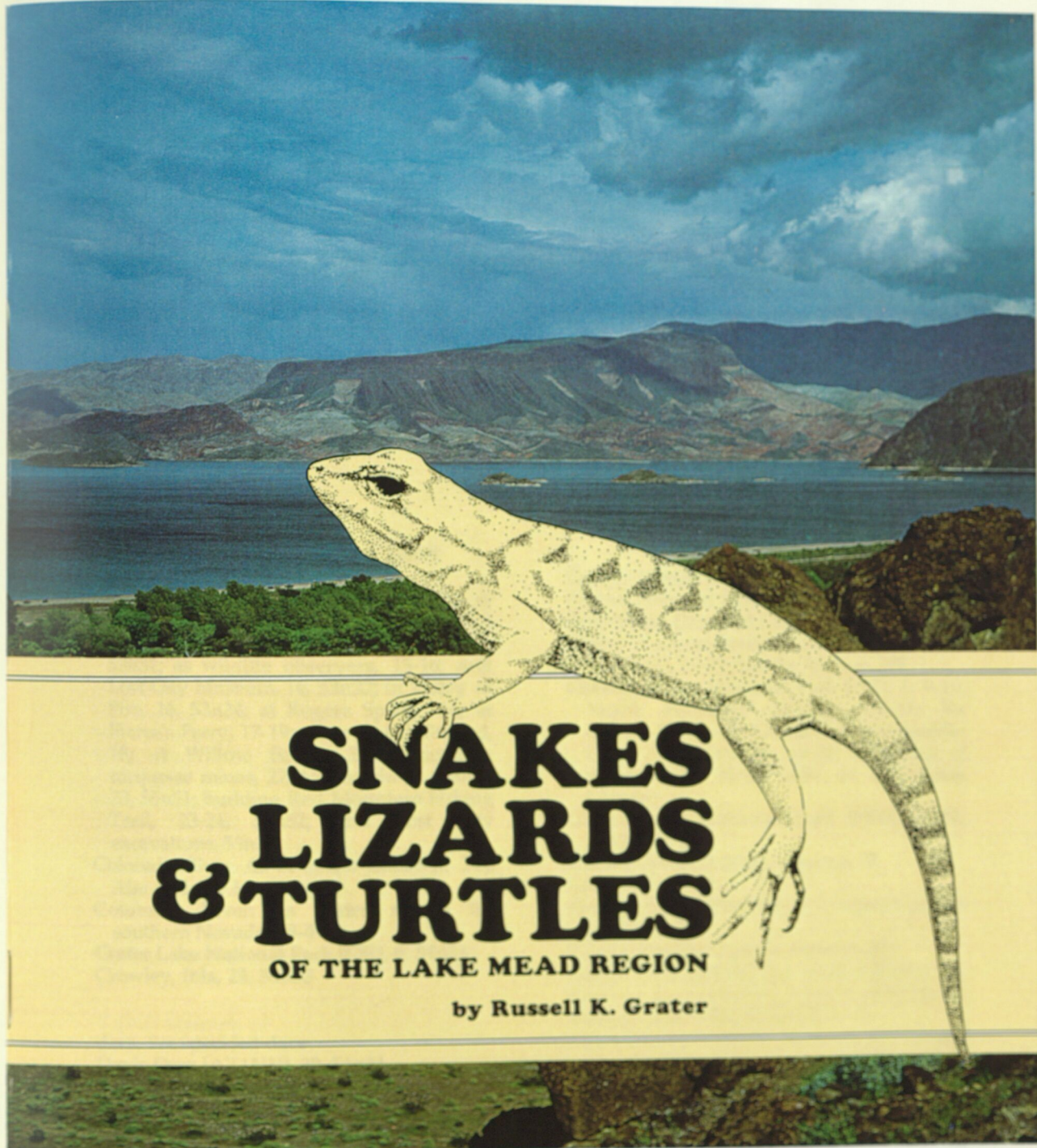


**INDIAN  
"WHY"  
STORIES**

*Russell K. Grater*

Discovering  
**SIERRA  
MAMMALS**





**SNAKES  
& LIZARDS  
& TURTLES**

OF THE LAKE MEAD REGION

by Russell K. Grater

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