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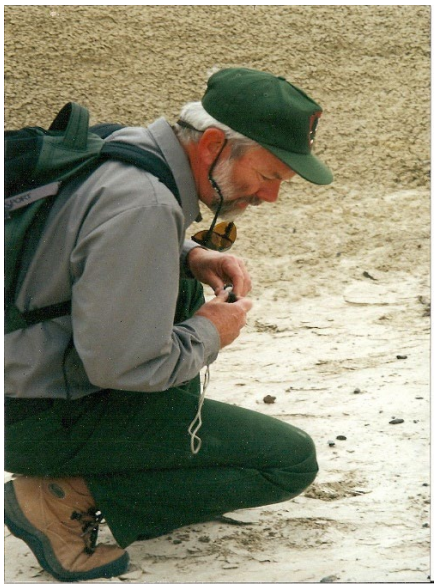

# Gorden Bell
# June 18, 2020

Interview conducted by Vincent Santucci
Transcribed by Teresa Bergen
Edited by Molly Williams

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Interviewer: Vincent Santucci
Date: June 18, 2020
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# Transcript

[START OF INTERVIEW]

Santucci: —and then we'll jump into the questions. Are you ready?

Bell: Ready as I'll ever be.

Santucci: Okay. Thank you. So today is Thursday, June 18, 2020. My name is Vincent Santucci. I'm the senior paleontologist for the National Park Service Paleontology Program. Today we are interviewing Gorden Bell who is a retired NPS geologist and paleontologist, who's worked in Great Basin National Park and Guadalupe National Park. Gorden also has undertaken paleontological fieldwork and research involving fossils from Big Bend National Park and Badlands National Park, which we'll try to discuss today. The interview is being conducted by telephone from Gorden's home in Texas. So, are you ready, Gorden?

Bell: Yes, sir. I'm ready.

Santucci: We'll start with the easiest question. So, when and where were you born? And what was it like growing up?

Bell: Oh. I was born in Birmingham, Alabama. And my family and I lived in a very rural setting in the vicinity of, well, probably the closest town is Morris. And that was in the Warrior Coal Basin. Anyway, I spent a lot of time wandering the woods and also picking through strip mines in the vicinity of my house. So it was kind of a quiet existence. And a lot of time to look through books.

Santucci: Do you remember the first time you ever found a fossil in the wild?

Bell: I don't know specifically, but I do remember that one of the early events was when my uncle had some gravel brought in to improve his road. And it was absolutely full of Mississippian chert that had all kinds of fossils in it. Spiriferoides. Other brachiopods. Coral. And that really kind of exploded the envelope there.

Santucci: Sounds like a good experience.

Bell: It was fun. It occupied a lot of my time for a while.

Santucci: (laughs) Very good. When you moved on from high school to college or university, where did you go to school and what did you study?

Bell: I first started college at the University of Alabama in Birmingham. And it, well, (laughs) I kind of cruised through a number of subjects before I started homing in on something that I liked that they had. Kind of started out in chemistry and then math and then finally we all agreed that I was not cut out for either of those two things. But they had a, they had an archeology program. Well, I should say an anthropology program. So that was closer. I had a keen interest in fossils, not fossils, artifacts from the Southeast. So I started studying anthropology and archeology.

Then, over a period of time, the university actually put together a geology program. And about 1976, I jumped into that with both feet. And started heading toward a real unified degree.

Santucci: And so, what year did you graduate from your undergraduate degree?

00:05:09

Bell: (laughs) 1981.

Santucci: Okay. Very good. And then from there, did you go on in school?

Bell: Yeah. Yeah. In ’86 I applied to graduate school, and was accepted into the program at the University of Texas as a PhD student. And so I started in the fall of ’87.

Santucci: And did you have a major advisor, or did you have faculty that you worked closely with?

Bell: Oh, yeah. Yeah. My main advisor was Tim Rowe. And Tim has also done a lot of work in Big Bend, as you are well aware. But just for the record.

Santucci: And the focus of your PhD dissertation?

Bell: It was marine reptiles, specifically mosasaurs. And the systematic classification of mosasaurs.

Santucci: And you focused on North American?

Bell: Mainly North American. I had to incorporate a few of the older, more primitive European forms. Just to kind of get a baseline.

Santucci: Okay. And how did you come about that as a dissertation topic? Was there something that triggered that?

Bell: Well, before I had started graduate school, I worked at the Red Mountain Museum in Birmingham. And I did a lot of work in the Cretaceous of Alabama. And actually found a fairly good mosasaur, which we mounted at the museum. And there were mosasaurs all over Alabama in the Cretaceous salts. And we had a program with the University of Alabama at Tuscaloosa to take students into the field in the summertime, primitive camping, and make them work all day in the hot sun. And we dug up a lot of mosasaurs and fish and turtles, just, you know, gobs of the marine Cretaceous fauna.

Santucci: Very good. Was part of your dissertation involve any specimens from National Park Service areas?

Bell: There were some. The Big Bend, there were two specimens from Big Bend. I think they were not very complete, so I actually didn't incorporate them. Although I think I did document their presence.

Santucci: Anything from Badlands National Park and the Pierre Shale?

Bell: Yeah, there were a few of those around. But again, they were not very complete. And since my study really required very good specimens with a lot of detail, I didn't incorporate them there, either.

Santucci: Okay. Did you ever do any fieldwork in the Cretaceous at Badlands National Park?

Bell: Oh, yeah, yeah, yeah. We did a lot of surveys, just looking for specimens. And found a couple of bones in the Black Hills. But not what I would call excellent specimens.

Santucci: And are those in the collections at the park or the South Dakota School of Mines? Or where would they be?

00:10:17

Bell: They'd actually probably be at the School of Mines.

Santucci: Okay. All right. I'm going to just digress for a second and ask you, in your career working on mosasaurs, how often did you have to encounter or address the question of mosasaurs being dinosaurs?

Bell: (laughs) All the time. All the time.

Santucci: (laughs) How would you address that?

Bell: Well, you know, I would explain well, they are lizards but they're not dinosaurs. And dinosaurs mainly walked on land. And mosasaurs mainly swam in the ocean. And even though the dinosaurs were the, well, some of the dinosaurs were rulers of the land, the mosasaurs were definitely in charge of the ocean in the Late Cretaceous.

Santucci: And you probably have seen, if not, I'll send it to you, the 2011 National Fossil Day logo actually featured a mosasaur.

Bell: Mm hmm. Yeah.

Santucci: Do you recall that? Did you recall seeing that?

Bell: Oh, yes. Yes. I did.

Santucci: Did I ever send you some pins for that?

Bell: Some fins?

Santucci: No, pins. Or patches.

Bell: Oh, pins. Yes, you did. Yes, you did.

Santucci: Okay. All right. Very good. I wouldn't forgive myself if I didn't.

Bell: Well, if you have any old spares laying around, I wouldn't mind having another one or two.

Santucci: Yeah, I'll be happy to send you a couple of those and some other items. So, when you finished your PhD, were you employed after that? Or did you do a postdoc? Or what happened after you finished your dissertation defense?

Bell: I got a postdoc position at the South Dakota School of Mines. And that's certainly what led me into the Badland area. And there, we did all kinds of work on marine Cretaceous. Mainly on the, oh, national forest land, the national grasslands, up there around the Black Hills.

Santucci: And was that fairly productive in terms of your field work?

00:13:16

Bell: Oh, yes. Yes. It was just, all summer long was just intense excavating and documenting. We were also doing inventories for the Buffalo Gap National Grasslands at the time. And then shortly thereafter, we did some inventories for the Bureau of Reclamation at Belle Fourche Reservoir and Angostura Lake.

Santucci: Excellent. Since you were in the South Dakota area, you were there for a couple of years, I assume?

Bell: I was there for six and a half years.

Santucci: Six and a half years. So you were there during the time period of the Sioux investigation. Is that correct?

Bell: That is definitely correct.

Santucci: Did you become involved in the investigation? Or were there any concerns or observations that you had involving fossil theft?

Bell: I did not become involved in any of the investigation. Our contract for inventory on the National Grassland was mainly related to salvage, so that it would be more difficult for there to be any fossil theft or anything.

Santucci: Okay. Very good. Were you aware of any commercial interest in mosasaurs during your career?

Bell: Oh, yeah. Oh, definitely. Yeah. Yeah, there were a number of folks associated with the Black Hills Institute that had interest in mosasaurs. And they were doing a lot of excavating on private land, getting mosasaurs.

Santucci: Do you recall, or did you have knowledge of any significant specimens of mosasaurs that wound up going into the commercial market and not going to the scientific realm?

00:15:55

Bell: Well, now, that's a tough question because there was a, there were a few, I'm sure. I was told of a number of specimens that I should look at. And I did take a look at. And I actually do not know what eventually happened with any of those. But I'm pretty sure they did not go into any of the collections that I was familiar with.

Santucci: Did they appear to be rare, complete, or even new taxa, potentially?

Bell: Yeah. There was one really interesting one from the Fox Hills Formation in North Dakota. Or maybe, yeah, North Dakota. I think that's North Dakota. Bison? Yeah. This was probably a new taxon. But we didn't get to study it.

Santucci: And the individual that had possession of it was a commercial dealer that asked you to look at it?

Bell: Um, I think it was just a, well, I don't know. I can't say yes or no. The person, I was not familiar with. But they represented themselves mainly as just being a fossil collector.

Santucci: Okay. Did they come into the School of Mines? Or how did you see the specimen?

Bell: I had to travel to see it.

Santucci: I see. Very good. Well, kind of an unfortunate aspect of, particularly the 1990s, that sort of thing happened.

Bell: Yeah. It was kind of a tense time. There were many times, well, specifically when we were doing inventories for the Forest Service in Wyoming, I know there were people that were actively engaged in commercially collecting fossils that were also spying on use from hilltops.

Santucci: Oh, boy.

Bell: (laughs) Yeah. Yeah. So, anyway, there was quite a bit of real dinosaur material in the area we were working. And our preliminary surveys had shown a number of ankylosaur scoops in an area that might have led to a good specimen. But when we went back to actually recover that several months later, it was all gone.

Santucci: Oh, boy.

Bell: Yeah.

Santucci: Yeah. Very disappointing to hear that kind of stuff went on.

Bell: Yeah. Yeah.

Santucci: How often would you notice people observing your activity? Was it a single occasion, or multiple times?

Bell: It was a couple of times. I wouldn't say it was something that happened a lot. But, a couple of times. Mainly in the area I was talking about over in Wyoming.

Santucci: Was that on public lands or on private lands when you were working?

Bell: We were working on public lands. And it's kind of interesting. One of the reasons we were doing the inventory and the salvage was because the Forest Service was planning to do a land swap. And the area was about to go into private hands. But the transfer had not actually happened at that time.

00:20:39

Santucci: I see. Very good. So before we transition to your National Park Service career, during the time when you were a student or during your postdoc, what would you say one of your more exciting discoveries would been, mosasaur or otherwise?

Bell: Well, the most exciting one was a mosasaur that apparently had embryos inside of it.

Santucci: Oh, wow.

Bell: Yeah. It had actually been pretty well worked over by scavengers. Dogfish. And we found gobs and gobs of small pieces of very, very undeveloped tissue and you know, a lot of more individual elements. Vertebrae, limb bones, pieces of the skull. So there was quite a bit of material there. But I never got around to publishing on it.

Santucci: Wow. Where is it, in the School of Mines?

Bell: That's where it was supposed to be. And I don't know if this needs to be on the record or not, Vince.

Santucci: Sure. It doesn't have to be.

Bell: But the last time there was a fossil conference, a National Park fossil conference in Rapid City, I went to find that specimen and I found almost none of it.

Santucci: Oh, boy.

Bell: Yeah. And I had heard, I had heard through, let's see, Gail Bishop, I don't know if you're familiar with Gail Bishop.

Santucci: Yes.

Bell: She is director of the School of Mines Museum at the time. I think it was he that told me that there had been some kind of a collapse of an air circulating system, and that it occurred right

above where this mosasaur material was stored. And best my memory serves me, it was kind of all scooped up and carried to the dumpster.

Santucci: Oh, my goodness!

Bell: Yeah. Yeah. Yeah.

Santucci: Was there fossil preparation done on it? Or was it left—

Bell: Oh, yeah. Yeah. I had spent a lot of time on it. We had tried to prepare the adult out of the matrix. And in doing so, we just found tons of pieces, these babies. So I would screen wash it and I would get out a whole lot of pieces of these fetuses. Or embryos, I should say. And lots of shark teeth. I picked them out and had them all vialed up, most of them identified as to what part of their body or which element they were. And I can't find any of that.

Santucci: Oh my goodness. So, did you get a sense or an estimate of how many embryos were preserved?

Bell: Yeah. During the time that I was doing the preparation, we found four left quadrates of baby mosasaurs. Quadrate's one of the skull bones. And four left ones sort of means there's four, at least four of the embryos.

Santucci: Wow. I assume you have photographs of the specimen.

Bell: I do have some photographs. Mainly of the embryonic elements, yeah.

Santucci: And what was the locality where you discovered that?

00:25:51

Bell: It was over on the Missouri River in the vicinity of Chamberlain.

Santucci: Okay. So in South Dakota.

Bell: Yes.

Santucci: Okay. Are there any other known mosasaurs with embryos preserved?

Bell: No, I don't think, well, it depends. (laughs) Again, it depends on how you classify a mosasaur. But I think Mike Caldwell reported that one of their European basilosaurids had embryos in it. I can't remember the name of that one right offhand. But I actually never really saw the report. I mean, I think by that time I'd kind of headed toward the Park Service and just kind of let the mosasaur work drop.

00:27:12

Santucci: Wow. I hope that somehow it winds up discovered. You would think when they moved the museum, though, they probably would have found it if it was there.

Bell: Well, yeah. I mean, the last time I was there, they were in the process of kind of reorganizing a lot of stuff they had moved. What I found of it were two boxes with very little material in it. And so I don't, you know, I can always hope that somewhere they're sitting around in a box that is as yet unrecognized or is not appropriately labeled or something like that.

Santucci: Do you remember what genus it was?

Bell: I would call it Plioplatecarpus.

Santucci: Okay.

Bell: Yeah, in fact, Van Garner did a painting which he gave to me of a mosasaur giving birth in the ocean.

Santucci: Wow. That's nice. That's very cool.

Bell: Yeah. Yeah. I'm going to have to do something responsible with that sooner or later.

Santucci: Well, very good. So, anything else before we shift to how you joined the National Park Service?

Bell: Well, I don't know. I could talk all day long about mosasaurs. But you know, the School of Mines has dozens and dozens of different very good specimens from their work in the Buffalo Gap National Grasslands and also over on the Missouri River, on the Crow Creek Reservation. So somebody who was interested in maybe doing some original work on mosasaurs could go through that collection. Although there's probably a lot of preparation to have to do.

Santucci: Sure. So there are numerous other National Park Service areas that have remains of mosasaurs. Mesa Verde National Park, Chaco Cultural National History Park—

Bell: Mm hmm.

Santucci: —are two that come to mind. Are you aware of any other national park areas that may have mosasaur remains that we haven't discussed yet?

Bell: You know, that's a difficult question to answer right off the top of my head.

Santucci: Sure.

Bell: I think I could probably piece a lot of that together. Let's see, who else? Yeah, I can't dredge that up right now.

Santucci: No problem.

Bell: I'd have to think about that.

Santucci: No problem.

Bell: But I'm sure you would be interested in knowing the ultimate answer to that question.

Santucci: Sure.

Bell: So we'll keep it on the back burner.

Santucci: Okay. So then, just to take advantage of the fact of your knowledge on mosasaurs, so what is the earliest known mosasaur, where did it come from and what's its age?

Bell: (laughs) The earliest known mosasaur that I can definitely pin down to a good stratigraphic interval and therefore a reliable age, they are Middle Turonian.

Santucci: Okay.

Bell: There probably are some Early Turonian ones. I was hoping that the guys doing the work in Angola might come across some of those. But not to this point. And then there was a Russian report of a Cenomanian mosasaur. And a number of people I've talked to said yeah, well, the biostratigraphy related to that is questionable. So to get right back down to things that you can nail down and feel fairly confident about, Middle Turonian.

Santucci: Okay. In terms of North America, what would be their paleobiogeographic range of occurrence? So would it be tied to the interior seaway during the Cretaceous? Are there mosasaurs known from Alaska and northern latitudes?

Bell: Yes. There are mosasaurs known from the North Slope, both in Alaska and in Canada. So far as their range in North America, it goes all the way from Middle Turonian to basically to end of the Cretaceous. But of course the mid-continental seaway dried up before the end of the Cretaceous. So most of the latest ones are either from New Jersey or California.

Santucci: One last general question. I find them particularly interesting. How the ammonites that appear to have the tooth impressions of mosasaurs. Any thoughts about that?

Bell: Well, I'm certainly a believer. I don't think anyone has ever found a mosasaur tooth actually embedded in an ammonite fossil. But the dental patterns are just, they're a dead ringer matches for the placement of mosasaur teeth. And a lot of the ones that show up, are out of the Bearpaw, I believe.

Santucci: Okay.

Bell: And there were a lot of mosasaurs around at the time perfectly capable of chomping an ammonite.

Santucci: Yeah. They seem to be quite abundant and extremely interesting.

Bell: Oh, yeah. Yeah. Yeah. I would love for somebody to come up with an ammonite with a mosasaur tooth embedded in it. And then, let's see, there's the guy who, is it Kase, who believes that they're limpet scars. And I, yeah, I kind of doubt that's actually the case.

Santucci: Very good. So, how is it that you ventured into the National Park Service? What was it that led you in that direction?

00:36:05

Bell: Well, the fact that my postdoc was running out and I needed a job. And I had done a lot of these inventories, like I say, for a number of the federal agencies. And so when I found out about the job at Guadalupe, I jumped into that and just put my experience down. And they apparently thought I was a good candidate.

Santucci: And do you remember who the superintendent was at the time who hired you?

Bell: Larry Henderson, I believe, was the superintendent at the time when they flew the job. I don't know if he was still there or if he had retired when I actually arrived at the job.

Santucci: Okay. And so did you work under Alice Richard?

Bell: Yes.

Santucci: And any other superintendents?

Bell: Yeah. John Lujan.

Santucci: Okay. Very good.

Bell: Yeah. And then I moved to Great Basin while John Lujan was still superintendent there.

Santucci: Okay. So what was your job and your responsibilities when you first came onboard? I know they evolved over time.

Bell: Did sort of evolve. But they very quickly put me into a position of being the physical scientist. And Fred Armstrong was there. And Fred and I used to joke about how I took care of the dead things and he took care of the live things. (laughter) And so that means I was actually doing, I was supervising or coordinating the air quality and water quality monitoring. And also the geology. Reviewing research permits for paleontology research. Or geology research, actually. Well, of course there was the old compliance thing.

Santucci: So all these other responsibilities that you gained, were you able to do much work in geology and paleontology during your time at Guadalupe?

Bell: Oh, yeah. Yeah. Quite a bit. Quite a bit. Yeah, there were so many geologists coming through that park. And discussions in the field. Addressing the questions about a whole lot of different things. But basically the whole Permian Basin was interested in what was going on at Guadalupe. And so I just kind of gradually got drawn into the research portion of it. So I wound up publishing a few papers and abstracts, and working with an old friend from Birmingham. We did a lot of work on reef ecology.

00:40:36

Santucci: And who was that?

Bell: Christopher Crow.

Santucci: Okay.

Bell: (beep) That rang someone's bell. (laughter)

Santucci: That was my computer. And so you also published on some sponge material?

Bell: I did. I did. I wound up getting very interested in the end of the marine sequence there at Guadalupe. It was not the end of the Permian, but it was when the Permian Basin dried up the first time. And there was a rock unit that, well, let's see. This is kind of a complicated answer. But some folks had published on these beds that had previously just been called the post-Lamar beds. And they were given the name the Reef Trail Member. And they're named for the Permian reef trail on the east side of Guadalupe Mountains National Park. And they were kind of unusual, but a lot of folks were interested in the Permian correlations from China to America. And several of them came out and did work. And we did a lot of field work, looking in new places. And we found a lot of paleo material in the western part of the park, in the Patterson Hills. So, wow, I say it's a long and complicated question. Or answer.

Santucci: So, Keith Rigby was one of your co-authors?

Bell: Right. Yes. Yes. Thank you. (laughs)

Santucci: That's okay.

Bell: Thank you for getting me back on track there. Yes. Keith Rigby.

Santucci: Okay.

Bell: So in working on these post-Lamar beds, we'd done some limestone block in the solution, in acetic acid. And all of these beautiful, beautifully preserved silicified sponges showed up. And many times we might acid etch a three-pound block of this material. And there would be literally five hundred to fifteen hundred sponges that came out of that treatment.

Santucci: Wow.

Bell: So, yeah. Obviously, Keith Rigby was the guy at the time. And he had, and I had been with some of the original research that was done by the American Museum. And the [Newell Edell?] report?

Santucci: Yes.

Bell: He was one of the coauthors. Anyway, he saw this material and got really excited about it. And next thing I know, he's sending me manuscripts. It was, it was good collaboration.

Santucci: Yeah, it sure sounds like it. So if you were asked the question, is there anything significant, unique, or important about the Guadalupe Reef that's different from other reefs? Modern reefs, or other kinds of reefs in the fossil record? Is there anything that stands out to you in terms of significance?

00:45:27

Bell: Wow. Well, first of all, it must have been a very, very different ecology. Because it's a sponge-dominated reef. Corals were actually very rare in the record at Guadalupe Bay. But there were brachiopods that grew almost like corals. And there's just a whole bunch of organisms that are preserved in that reef that you do not see anywhere else, except in time-equivalent reefs in China.

Santucci: Is there any continental drift or plate tectonics relationship to those co-occurrence's across the Pacific Ocean?

Bell: Not that I'm aware of. It was very, very, yeah, they were very widely separated at the time. Although I think it has a great deal of bearing on how one would interpret oceanic currents at the time.

Santucci: Very interesting. Yeah, Guadalupe Mountains is quite a park.

Bell: Oh, yeah. Yeah.

Santucci: So were you there during the evaluation of the Guadalupian stratotype discussion?

Bell: Yeah. Yeah. I was. They had mainly been formulated by the time I got there. But there had been so much activity, I think that's one of the reasons that caused the Park Service to hire a geologist, paleontologist, for just interacting with all of those people. So, yeah, I was present during a number of international field conferences. And went to the outcrops. Heard lots of the discussions. And eventually over time actually started to participate in the discussions and in the research.

Santucci: And can you just briefly explain what the significance of that stratotype is at Guadalupe Mountains National Park?

00:48:42

Bell: Well, yeah. It is essentially the measuring scale for the middle part of the Permian Period. And in fact, the middle part of the Permian Period bears the name Guadalupian. So it's the standard. It's the reference section you compare everything else to when you start talking about the Middle Permian.

Santucci: By chance, do you know, are there any other stratigraphic type sections within the Guadalupe Mountains National Park for any other strata?

Bell: Well, as it was set up by the committees, the Guadalupian Series was made up of three subdivisions and all of those three subdivisions had their stratotype sections also at Guadalupe Mountains National Park. So it was like the big chunk and three ways to subdivide that big chunk.

Santucci: And it's a park that I know that you get a lot of field groups coming, both students that are involved in their geologic field camp, as well as oil industry geologists coming out and trying to study and learn about the Permian System. Did you interact with them at all?

Bell: Oh, yeah. Yeah. Yeah. A lot. As I said, I reviewed research permits. And I had a number of discussions with the principal investigators and their students, and then also the school groups, the university groups that would come out to do the field examinations of these outcrops. I went with a lot of those folks whenever I actually had the time. And that was very fun.

Santucci: Yeah. I bet you probably had a chance to meet a lot of academic geologists and paleontologists through that.

Bell: Absolutely. Absolutely.

Santucci: So, I visited Guadalupe Mountains National Park probably a half a dozen times. On two occasions, I observed the same sort of thing where there was a couple of vanloads of kids that were out with their rock hammers on the Park Service land, banging on rocks. Did you ever experience that?

Bell: No. I did not.

Santucci: Good.

Bell: Yeah. Most of the, most of the field trip leaders were very adamant that their students couldn't do that. That might have happened on some road cuts. But there's a lot of road cuts around Guadalupe that are not in the park. Yeah. Yeah. There's one of these international field conferences that, there were some folks that wanted to carry their rock hammers. And I said, "I'm sorry, we don't allow to use the rock hammer unless you have a research permit. And, because of the feeding frenzy aspect of things, we don't let people collect specimens while they're on a field trip with a bunch of other folks."

So they got, one guy kind of got a little bit irritated because, "I always use my rock hammer for a scale."

I said, "Well, maybe you can borrow a scale from someone else." (laughter) Yeah. So we were actually working very hard to impress it on these folks that you know, if you want to come back in twenty years and see this, this is what the national park is trying to make happen for you. And because of that, we don't allow rock hammers.

Santucci: Very good. So the Permian fauna of Guadalupe Mountains is predominantly invertebrate. Many important sponges. There are a few vertebrates that are preserved within those Permian rock systems. Some fish, Helicoprion, there's one specimen of the whorl tooth shark that comes from Guadalupe Mountains. Had you ever seen any vertebrate fossils from the Permian at the park?

00:54:44

Bell: Oh, yeah. Yeah. Yeah. There are actually some spots where you can find quite a few. I have seen a fair number of shark teeth. Most of the time it resulted from acid edging blots to try to get the silicified sponges out for study, obviously. And the shark teeth tend to show up in the fine material that results from that acid etching.

But I've also seen a number of nodular type occurrences. I presume you're familiar with the Mazon Creek fauna.

Santucci: Yes. Mm hmm.

Bell: Okay. So there are actually portions of the section that [unclear] where there are little concretions, little round things, just slightly flattened. If you tap them with a rock hammer on their sides, some of them will split open and you can see a shark tooth or a fish scale or even sometimes several vertebrae in articulation.

Santucci: Nice. Very good.

Bell: Yeah. Yeah.

Santucci: Go ahead.

Bell: Yeah, I was just saying, that's something I tried to get some folks interested in. And maybe, maybe some people in Dallas kind of took up that baton. But I hadn't heard from them, so I'm not sure.

Santucci: Very good. I work with Dave Elliott at NAU and his graduate student J.P. Hodnett. And they focus on late Paleozoic sharks and fish. So, did you ever make any collections of those that are in the park collection?

Bell: Yes.

Santucci: Oh, good. Okay.

Bell: Yes.

Santucci: Excellent.

00:57:19

Bell: And I presume those are all at Albuquerque now.

Santucci: Likely so, yeah.

Bell: Yeah.

Santucci: So, one other discussion regarding Guadalupe Mountains. The Pleistocene, Holocene cave fauna. Did you have any opportunities to get out to some of the caves and see any of that fauna?

Bell: I did manage to make it out to a number of the caves. I did not really see any of the fauna, because, well, I take that back. I saw what was in the collections at Lubbock from some of the 1970s work. Craig Black and one of his students did some collections. And I believe, [Janina?] kind of coordinated getting a lot of that stuff either brought back to the park or I'm not sure exactly what happened with that. The museum at Texas Tech had their notions about who owned what and what they were going to keep. And if it was going to be owned by the Park Service, I don't know. I never exactly understood. We had plenty of money to inventory and rework that material. But they didn't want to give it up. And so I don't know if they ever did or not.

Santucci: Okay. And so, did you get out to the Upper and Lower Sloth Cave or Pratt Cave or any of the other ones?

Bell: Yes. I saw Pratt Cave, for sure. And the Upper and Lower Sloth Cave, yeah. And Dust Cave. And what they call Indian Cave, which is also on the west side. Yeah. I got out there. I will tell you this, you have to really want to go to the Sloth caves to make it.

Santucci: Did you have to rappel into any of those?

Bell: No. No. Although I did decide (laughs) not to try to enter Dust Cave. We could see it from nearby. But it's a steep slope right at it. And not much to hang onto. And I think, you know, it was kind of a hard trek out there. And by the time we got there, probably kind of tired. And didn't really want to get ourselves into a bad situation. But I do believe at Dust Cave, if you're going to enter it, it would definitely help to have a belay system to get in there.

Santucci: Do you have a sense that there are caves that are still yet to be discovered in the Guadalupe Mountains that likely have, or potentially have, Pleistocene vertebrate material?

01:01:39

Bell: I do. I definitely do. I've seen a number of places where there was definite speleothem debris on the surface. So I feel fairly confident that there had to be some remnant of a cave somewhere in that immediate vicinity. And some of them actually over right off the Permian Reef Trail, there's that one called Three Hole Cave. There are other caves real close to that. But they are precarious, dangerous to get into. And those are some maybe, it would be worth rappelling into. But I don't know for a fact that they contain vertebrate materials. But I would be surprised if they did not.

Santucci: Very good. Before we move on to Great Basin, any final thoughts regarding your time at Guadalupe Mountains? I assume it was a rewarding period of your life.

Bell: Oh, yeah. Yeah. Absolutely. It was wonderful. It was, you know, it was just amazing to me how rich a geologic resource was there. And paleontology, too. And it's all tied together. And there's a reason, they picked it for the Middle Permian stratotype.

Santucci: Excellent. So how did you wind up moving on then to Great Basin National Park?

Bell: How? Hmm. Well, I saw the position for Great Basin and I didn't know all that much about it. But I knew there was a lot of Ordovician rock in the vicinity. And I thought oh, that

might be a nice place to work. And coming from Birmingham, and working at the Red Mountain Museum there in Birmingham, I guess basically most of my early intense work was in the Ordovician. So I thought, that would be nice to kind of get back into the Ordovician and see what they have there.

So anyway, I applied for the position. And about, I'm sure you remember the Deep Water Horizon episode?

Santucci: Yes. Uh huh.

Bell: Yeah. So I was on a detail down to the Deep Water Horizon event. And the guy from Great Basin called me up and said, "I want to do an interview with you." (laughs) So, while I was there, we talked for a couple of hours. And he just decided that maybe I was the guy he needed. As it turns out, the position was actually a compliance position. But my collateral duty was to do paleo-inventory.

Santucci: Very good.

Bell: Yes. (laughs)

Santucci: So, did you do a lateral into that position? Or how did you wind up there?

Bell: Yeah. It was a lateral. Yeah. Total lateral.

Santucci: Okay. And so then, what was your position title at Great Basin, and what were your responsibilities?

Bell: Oh, position title. Environmental protection specialist.

Santucci: Okay. And so you did environmental compliance. You did physical sciences as well?

Bell: Not so much the physical sciences. Mainly, there was a lot of compliance to have to do. And I pretty much filled in the rest of the time with paleo, and paleo inventory. Yeah.

Santucci: Okay. Okay. So I know you were able to recruit and utilize a number of paleontology interns that did a lot of really good work under your leadership. Did you want to begin generally about what your goal was through the inventories at Great Basin National Park?

01:07:21

Bell: Well, yeah. The goal was actually to document fossils. When I got to Great Basin, they had one fossil on their collection inventory. And I found it. And it was a chunk of rock with a lot of little bitty ground up fossils in it. You know, not exactly anything greatly exciting. But I could tell from that piece of rock, there were a lot of fossils out there. And knowing it was Ordovician, Middle Ordovician, and it was basically marine, and shallow marine rock types. So I knew there would be plenty more fossils out there. And so my boss says well, you know, we need to know what we have. So that was my focus is to go find what they had. And they just had lots of wonderful things.

Santucci: Do you recall, I didn't ask this earlier, but do you recall what year you departed Guadalupe to go to Great Basin?

Bell: Yeah. That was 2010.

Santucci: 2010. And what year were you hired at Guadalupe Mountains?

Bell: Right at the very end of '99.

Santucci: Okay. So you spent a little more than ten years at Guadalupe Mountains.

Bell: Right.

Santucci: Okay. And how long were you at Great Basin?

Bell: Five years.

Santucci: Five years. Okay. And so, for that period of time at Great Basin, how many interns did you supervise, approximately?

Bell: One, two, three, four, five. Yeah. I'm thinking five.

Santucci: And of those five, did you have a game plan for each one of them? So, for example, did you inventory a different geographic area in the park or a different stratigraphic unit of the park? Or how did you organize your strategy for inventory?

01:10:02

Bell: Mainly to try to go to areas that had not been looked at. Yeah, there was a strategy. You get out there and there are places you can get to and places you can't get to. So I tried to schedule them to go out to places we didn't know much about. We had polygons on our geologic map which indicated that there probably should be some good materials out there. So I just said, okay, this is what you're looking for. And I would give them access to the photographic documentation of what we'd found so far and said, "Go find these. Take this GPS unit, go look for these in this spot. And take pictures. And by all means, take a GPS reading on everything that you take a photograph of." And it worked out really good. Some of these folks were real gung-ho.

Santucci: Do you recall some of the more interesting or important discoveries that were made through the inventories?

Bell: You know, Vince, part of the issue was, no one really knew what was at Great Basin in terms of fossil resources. And so I'm kind of thinking like everything we found was significant. And then there were, there are some other things. There are some of the oldest corals in North America at Great Basin. There are echinoderms. And I think there's a guy still working on some of the echinoderms now. They're just like really weird. Early echinoderms, Cambrian and early Ordovician echinoderms are very, very strange critters indeed. And, let's see. Yeah. One of the GIPs was with me when we found a starfish that has since been named. And is the type specimen for a new family of starfish.

Santucci: Exciting stuff.

Bell: It is. It's really good. Of course, the bad part was we only found half of it. (laughter) Yeah. It was on a slab of rock that was sitting on a root. And it was like 40% of the rock was hanging over the edge of the root. And we snagged it, but we were just in time. And we never found the other half. We searched uphill, downhill, all around, several times, and never did find the other half.

Santucci: I assume that these experiences were rewarding to each of the interns?

Bell: Yeah. I think so. I think they were pretty excited. I know the guy who was with me when we found the starfish was quite excited. But you know, I kind of think all of the GIPs who came through Great Basin were, they were gratified that they had accepted that position.

Santucci: Yeah. They're good opportunities for young people.

Bell: Indeed. Indeed. And I can't say enough about that program, anyway. There are some excellent folks that are coordinating that program. And I had a lot of help along the way in getting these GIPs, and getting funding for these GIPs. And it made a huge difference in the inventory. And these folks, you know, they would go out to the middle of nowhere. And we would spend four days out in the field. Three nights, four days in the middle of nowhere, and they were perfectly cool with all of it. And I think they really realized that they were contributing to a fairly significant inventory.

Santucci: Absolutely. And so, just to be comprehensive, there had been some fossil vertebrates collected from Lehman Caves. Do you know the name Charles Rozaire?

1:16:01

Bell: I'm sorry. Could you repeat that question?

Santucci: Yeah. So there was an archeologist who was doing work in Lehman Caves back in the '60s and '70s. His name was Charles Rozaire. And he made a small collection of vertebrate fossils from Lehman Caves. Do you know about that work?

Bell: I do know about that work. Yes.

Santucci: Okay. Is there a potential for other material, Pleistocene, Holocene material from Lehman Caves?

Bell: Absolutely. Absolutely. Yes. If you can work out the issues with the archeologists concerning human remains and you know, how to sample in there without disturbing any of those human remains, I think there's great potential for more. Some of the stuff he collected was, what do you call, the desert tortoise, which had really been in that area for quite some time. And another indicator there was the marmots. There were some big marmots there. And those seemed to be correlated with other things that I know for a fact are Pleistocene in age. So, yeah. I think some of the deeper levels in Lehman Cave probably have a significant Pleistocene fauna.

Santucci: Very good. And so upon your retirement, and I'm trying to remember what year did you retire from Great Basin?

Bell: Twenty-fifteen.

Santucci: So at 2015, you didn't really retire, because you immediately got immersed into publishing the Great Basin paleontological resource inventory report.

Bell: Yeah. Okay. Yeah. Yeah, well I was just, you know, dotting the i's and crossing the t's.

Santucci: Yeah. So that really was an important contribution. Five years' worth of investment of a lot of hard work and field work and documentation. It's nice that it had been immortalized into that report. So thank you very, very much for doing that.

Bell: Well, I thank you for coordinating all of the people to work on it, too.

Santucci: Yeah, that's a good reference that we show to other parks that are interested in these kinds of inventories. And they're really impressed with the level and the detail of work that was accomplished during your time there.

Bell: Good. Good.

Santucci: So, any final concluding remarks about your life in the National Park Service, your life as a paleontologist? Anything that you'd like to share?

01:19:35

Bell: Oh, gosh, Vince. This is only supposed to take an hour. I could probably talk for days, days about that. All I can say is that my experience with the Park Service was more than rewarding. I'm very glad to have had the opportunity to work in those two parks that I spent a lot of time in. They're phenomenal parks. They're not just beautiful; they're full, full of geological and paleontological information. So that's, without getting gushy (laughs) that's kind of my thoughts about it. I'm very happy to have had the experience.

Santucci: Good to hear. So for the fifteen plus years that you provided service to the National Park Service, we gained a lot from that. You're amongst a very small group of Park Service geologists and paleontologists. Through the history of the agency, there hasn't been many of us. And you made a significant mark on two different parks that weren't as greatly recognized for their paleontological resources until you came onboard. And I think you changed that forever. So we're so lucky and fortunate to have had your service assisting us in those very, very positive directions. I don't think we'll turn back on that, ever.

Bell: Well, thank you, Vince. I appreciate those comments. And like I said, it was very rewarding for me. So, I'm glad it was a significant contribution.

Santucci: Unquestionably. So before you get off, I did want to get your mailing address. And if it's an address I can send a FedEx package, I'd like to send you a couple of things in appreciation for you taking the time for this interview.

Bell: Oh, okay. Okay. All right. So this is where things get a little bit complicated, since you said FedEx, you'll actually need a physical address..

Santucci: Okay. Okay. Very good. I'll get something out to you right away. And again, really appreciate your time—

Bell: Yeah, sure.

Santucci: —in helping to preserve this important his that you've contributed to the Park Service.

Bell: Anytime. Anytime, Vince. You know I'm here to help because the resource is, to me, the main thing. And that's what we're there for.

Santucci: Well, thanks Gorden. Go ahead.

Bell: Do you want a mailing address?

Santucci: Sure.

Bell: Just in case, it is general delivery, Marathon, Texas.

Santucci: Okay.

Bell: We have not actually done a formal change of address.

Santucci: Okay. (laughs) Fantastic. Well, I sure appreciate your time and look forward to our next conversation and I'll be getting some things out in the mail to you tomorrow.

Bell: Yeah. Okay. Great. Great. Thanks, Vince.

Santucci: Thanks. And give my regards to your wife.

Bell: I will. I will. All right.

Santucci: Enjoy your retirement.

Bell: (laughs) I will.

Santucci: Bye-bye.

01:24:37

[END OF INTERVIEW]