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Vincent Santucci's NPS Oral History Project, 2016-2024

Rob Weems
February 19, 2021

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

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Date: February 19, 2021
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Transcript

[START OF INTERVIEW]

Santucci: Okay. Today is Friday, February 19, 2021. My name is Vince Santucci. I'm the senior paleontologist for the National Park Service Paleontology Program. Today we are interviewing retired US Geological Survey geologist/paleontologist Robert Weems. Today's interview is being conducted over the telephone from Rob's home in Herndon, Virginia, and I am participating from my home in Gettysburg, Pennsylvania. So thanks very much, Rob.

Weems: You're most welcome.

Santucci: So we'll start off with the easiest question. When and where were you born?

Weems: I was born in Virginia.

Santucci: Okay. And then just some real basic information. In terms of your growing up, before you went to college, was there anything that got you interested in nature, geology, or paleontology?

Weems: Well, my mother grew up on a farm down in lower Hanover County. Down near the old Cold Harbor Battlefield area. And we'd go down there on weekends to visit every week or two. And I was restless as a kid. My dad would take me out walking around on the farm. It was about 120 acres, I think. Big area of plowed fields. They had places out there where after they plowed, you could go pick up old pipe stems, wine bottles, bits of pottery, things like that from colonial times. And arrowheads, occasionally. Down in the woods there were just a lot of interesting natural things to see. And there were gullies with some fossil seashells. So that kind of primed me that I liked it out in the woods. I liked it outdoors.

And the other thing that got me really going was in the second grade, I was at a little private school. And there was a library. And there were two books in there that I read. I read most of them. And one was called *All About Dinosaurs,* and the other one was called *All About Strange Beasts of the Past.* Both by Roy Chapman Andrews. And *All About Dinosaurs* got me hooked. I knew in the second grade that that was what I wanted to be doing, and nothing else would do for me.

02:44

Santucci: Very good. Excellent. So what year did you begin your college studies, and what school did you attend?

Weems: I grew up in Ashland, Virginia and went to grade school, high school there. But also, Randolph Macon College was there. My father had gone. And thanks, I guess to him, and also, I had pretty good grades, I got a scholarship. So I ended up going to Randolph Macon for undergraduate. I started in 1964, fall. And graduated the spring of 1968.

Santucci: Excellent. And your undergraduate studies, what was your primary focus?

Weems: Biology. They didn't have a geology department at the time. They had a one-semester course in geology. But the closest thing that I could get to was biology. Because, of course, being interested in paleontology, that's the place where it all begins. So I majored in biology.

Santucci: Very good. And then graduate work?

Weems: A little complicated. After undergraduate, I managed to get a scholarship to go to the University of Oklahoma at Norman. And I got out there for a semester, which I really enjoyed. But then the draft got me. So I got drafted out of graduate school. And ended up in the army for two years. I kept that to a minimum because I wanted to go back to graduate school. By the time I got out of the army, I had gotten married. And my wife didn't want to go back out to Oklahoma. So I agreed to stay in Virginia and went to Virginia Tech. and I did my master's degree there in, let's see, 1972-1973. Then after that, I got a bit of a scholarship, nothing great, but it got me in the door to Queens College in New York. And at the time, I was hoping to become a specialist in fossil fish. And there was a fellow up there named Don Rosen who at the American Museum, who was doing fish at the time. Queens was, the biology department was headed by Max Hecht. And the idea was that I'd do my classwork over there and then do the graduate PhD work over at the museum. And unfortunately, I barely got there before Don and Max had a huge falling out. They had known each other since they were five years old. And when they fell out, it was more like a divorce than an end of a friendship. And it pretty quickly dawned on me that it was not going to be plausible to think that I could keep them both happy. And I wasn't real happy in New York. I liked the people in New York, but the city itself was just too concentrated, too busy. It was around late '73. And it's interesting. The recent movie *The Joker* takes place at that time. And that's kind of the way I remember the city being. Kind of sinister, almost. I think it was probably the low point of the late twentieth century for the city.

Anyway, it didn't work for me, so I gave it up after a year. Came back to Virginia. And I was talking to Nick Hotton at the Smithsonian about how sad I was things hadn't worked out. And he said, "Well, if you can get accepted at George Washington University, you can always come work with me." Which was, you know, very pleasing. And really gave me a shot in the arm, which I needed at the time.

So I applied. And I did get a scholarship at GW. So I ended up there. And did my doctorate work mostly in geology. A mix of geology and paleontology. And did my dissertation on Doswellia, which was a Triassic, bizarre little reptile that showed up in Kings Dominion.

07:19

Santucci: Excellent. Very good. So, after you completed your dissertation, did you do a postdoc or did you find employment?

Weems: I ended up at the US Geological Survey. Towards the end of the time I was working on Doswellia I had a drawing I'd made of it. It was way too big to fit in the bound copy for my PhD dissertation proper and my advisor, who was Tony Coates, said that well, the USGS had a machine out in Reston that could take a big picture like that made and blow it down to a page size. So I went out there and found the room that had the machine to reduce pictures. And while I was in there, a lady walked in by the name of Brenda Higgins—or Hauser, later, she got married. And I had known her at Virginia Tech. we'd worked together on a Fisher site. She discovered it and I got interested. We worked up a paper on it. So just by dumb luck, she wandered into the copy room while I was in there. And we were kind of, "Hi, great to see you." And I asked her, "Well, since I'm here and you're working here, is there any chance of maybe trying to get a job here at USGS?"

And she said, "There is something. I'll check and see if maybe that's possible."

And then I guess about a couple of weeks later, Jim Owens, who was a prominent person in the eastern branch back in those days, called me up and said that they were doing a project down in Charleston, South Carolina. And that since I had worked, my master's work had been on geology in Taylorsville Basin. But it was on the fall line, so I'd done some Piedmont, some Triassic and some coastal plain. Based on my coastal plain work, they said they thought I was qualified to come down and work on Charleston. I said sure, I'd love a chance to do it. And it took a few months, government being government. But they did get back to me and said that they had a position that opened up, and if I wanted it, I could take it. And that was right after I finished up my dissertation. So I decided a bird in the hand is worth two in the bush. And of course, you know, coastal plain, local area. I decided I'd take it and went out to the USGS and never left, until I retired.

Santucci: That's fantastic. It's hard for those kind of things to happen today. But it really worked well for you. What year did you retire?

10:24

Weems: 2010.

Santucci: 2010. And you've kept very active since your retirement. You've been able to put forth quite a few important publications as well. So your retirement. How would you characterize your retirement? Are you enjoying your time?

Weems: Busy. (laughs)

Santucci: Busy. Okay.

Weems: Yeah. It was kind of in the nature of, I don't know, maybe it's partly in me. But it's always been kind of in the nature of the Survey that the projects were never quite long enough to get everything done that really needed to be done. So as I went along, project after project, I had this residue of things that I started and I really wanted to finish them, and I never had the chance to do it. So when I had the chance to retire, I decided that this was my chance to actually finish up all this stuff I hadn't gotten to. It was about like thirty or forty papers by that point. So 2010, I retired and started in on getting these things finished up and published. And I've been at it pretty

hot and heavy ever since. And this last year, the one silver lining of the Covid thing, it's really kind of forced me to keep my nose to the grindstone. So last year I got six papers done. And I guess I'm working on my second one for this year. I think I'm down to under ten at this point. (laughs) But it's been quite a bit of work to pull it all together.

Santucci: Outstanding. Well, we certainly appreciate you being able to pull that information together. It's very useful for us. So the focus of what I'm seeking primarily is any work related or associated with a National Park Service area. And I know that you had done some work at Manassas Battlefield. Before we get into that, could you briefly describe your role working for the US Geological Survey? And I assume it must have evolved over the course of your career?

12:50

Weems: Yes. That's kind of the nature of the place. But I ended up in the Eastern Regional Branch as a stratigrapher. And paleontologist was sort of more in quotation marks at that point. Fortunately, of course, the stratigraphy is helped by having good stratigraphic control on vertebrate [unclear]. So that kind of gave me a chance to continue my interest in those things while working. But then in Charleston, it was the earthquake project. We did some interesting stuff on the earthquake. Worked with a fellow named Steve [Stephen] Obermeier who was an engineering geologist. And we excavated out a number of things called liquefaction features. Which are places where an earthquake gravel blow water out in a geyser. And then when a crater collapses back in, sometimes wood fragments and leaves and things would end up in the bottom.

So we dug through a bunch of these things, got out some of the wood at the bottom, radio carbon dated it and ended up coming up with a pretty good estimate that the earthquakes down there happen about every 3500 years on average.

But at the same time, I was also working a lot on stratigraphy, which was not that well known at the time. I started a really comprehensive augur hole drilling program regionally through the area. Because there's not that much outcrop. We went through and literally did an augur hole, 40, 50 feet on average, about every mile for an area of about 44 7 ½ minute quadrangles. And ended up putting together a big regional map. A lot of smaller scale maps, big regional map on Charleston area, which is available at the USGS publications warehouse. Charleston geology map. My name, and you can find it easily enough. But it's pretty detailed, considering all the work that went into it. And we also made a compilation of all the augur holes we did and got those put out in open file reports. So the whole thing is set up so that every point we've got, there's a record of it. Then we integrated together this larger map package. And that, by the time that got done, I had a pretty good handle on the geology from the upper Eocene on up in the area.

And then after that, they put me on a project on the Newark Supergroup. And [unclear] that up. Then they put me to mapping. Of course, I'd done my master's on the Taylorsville Basin. So that was kind of a natural transition.

So I did a lot of mapping on basins in North Carolina, Virginia, Maryland. Not so much farther north. Though later, after I retired, I got working some on the Fundy Basin. And let's see. Then from there, we go back and forth. I had occasions to continue some of that. Then I got

working in Virginia. And then North Carolina towards the end. I did quite a bit on the coastal plain there. So all of this gave me a pretty good sense of the stratigraphy. The Mesozoic and Cenozoic stratigraphy through the east. And for a short spell, I ended up a few years out in Missouri. Working in the Ozarks. That was kind of out of left field. Did a quadrangle map out there and helped on a couple of others. That was quite different from any of the rest of the things I did. But for the most part, I've worked between Delaware and South Carolina. I did work in Georgia for a little while, too. So it's been all up and down the east coast.

Santucci: And then during your career working in, you worked in the P&S Branch, I guess. The Paleontology and Stratigraphy Branch.

Weems: Actually, I was with the Eastern Regional Branch.

Santucci: Okay.

Weems: Because I was doing the stratigraphic work. And a lot of it, I really, well, I knew I needed and was happy to make use of the skills and abilities of the people there. So I'd go out and collect samples. And they'd run them. And oftentimes, you know, we'd co-author on things that came out. But I almost felt like I was a member of the branch because I spent so much time there. But I was always officially with the Eastern Regional, and whatever later it got to be called.

17:35

Santucci: Very good. Do you have any thoughts about the end of the P&S Branch during the early 1990s?

Weems: Well, it was very sad. I guess that's, the politest way to put it, I guess, is that it struck me as a classic example of pennywise and pound foolish. It compared to the total budget of the government, it was miniscule. What they saved was very little compared to the expertise they lost. Of course, part of what I ended up doing in my retirement were things that would have continued going if P&S had continued, but didn't. It's really sad. They devastated the place. And of course Tom Gibson, I think the basically did him in. Not in any direct sense. It's kind of different with people in science. There is some ivory tower quality, I think, to all of us. And what they did to him, I think, was kind of the moral equivalent of a rape. And I think it took a few years for it to finally grind him down. But he did finally in the end do himself in. And I directly blame the RIF on that.

And of course, Robert Blodgett, who was doing really good work. But he wasn't the sort to show off about it. He just did his job. And unfortunately, the way it was, if you didn't show off what you were doing, they assumed you were doing nothing. Which was totally untrue. And of course, the other thing with Robert is that he was assigned back here, but he was, in terms of his administrative position, he was out in the west coast. And when the RIF [Reduction in Force] came, the people back here said, "He's your problem." The people back there said, "No, he's your problem." And nobody blinked, and they let him fall between the cracks. I mean, he was really resourceful. He did really great work. I did get to go that one time with him to Alaska. And I was amazed how he managed to get so many essentially free rides from Park Service, Forest Service. He'd find out what they were doing. And if they had extra space, he'd talk them into

letting us come along and do what we wanted to do. And he was able to get things done, even without a budget. And to me, he's the kind of person, you know, that we should have wanted to have kept. And it was just so foolish to let him go. But it was done.

Santucci: During your career, the P&S Branch staff generated the E&R reports. I'm sure you're familiar with those.

Weems: Oh, yeah. I was responsible for a lot of them having to be created to keep me happy.

Santucci: Excellent. So that's what I was going to ask you. Did you produce any E&R reports? And are there any that would be of interest to us in the Park Service?

Weems: Well, I didn't, you know, I was the one who sent the samples in and asked the questions. But they weren't done by me as such. Maybe in the course of my career—and I don't have a clear memory on this. But maybe once or twice there was something of a vertebrate nature that showed up that I had occasion to do. But for the most part, it was things, you know, pollen reports, [data flash?] 21:44 reports, nannofossil reports, mollusk reports. All of which were to answer questions about what correlated with what where I was working. So they were hugely useful and I think they were a grand idea. But I wasn't really responsible for actually doing the reports. Just setting it up so that they'd have to be done.

Santucci: We found the records within the E&R reports are extremely valuable to us, the Park Service. We've been able to gain access and identify localities that have been long ago forgotten. And because those areas were productive in the past, for the ones that occur within national park areas, I mean, obviously those units are still fossiliferous, and has clued us into the distribution of sites within national parks, allowing us to better manage those sites.

22:48

Weems: Yeah. Yeah. And of course, they were very useful to me at the time. And I kept them. And oftentimes I've had occasion to go back and reread them and use the data ten, fifteen, twenty years later. So, they're a goldmine.

Santucci: Excellent. So, how did you get involved in the work at Manassas Battlefield?

Weems: Well, one of the things, I was doing a lot of 7 ½ minute scale mapping. And especially the Culpeper Basin. Unfortunately, none of it, because of the RIF, you know, the things collapsed. So all of my 7 ½ minute maps that I did in Culpeper Basin are still sitting in a drawer at the Survey, never got published. But I mapped the quadrangle that the Culpeper Quarry's in. But I also did a set of four. There was Gainesville, which is where most of Manassas Battlefield was in, Arcola to the west. Let's see. North of Gainesville. I guess that was Herndon. And Sterling. Anyway, there's a set of four of those maps that I did. And I went through, you know, up and down the roads, up and down the gullies. So I ended up going pretty much all through the park. I got permission to go in and work there and sign my life away if I did anything wrong. And I did a lot of detail mapping in there.

Santucci: Very good. And then the discovery of the paleontological material during that field work. Was that associated with the mapping project?

Weems: Some of it was. Some of the footprint material was a result of that. There was a somewhat later spinoff. One of the later things in my career I got into was conchostracan biostratigraphy. And conchostracans are, basically they're brine shrimp or fairy shrimp, they're called. Children used to be able to order them through the mail as sea monkeys.

Santucci: Right. (laughs)

25:13

Weems: Anyway, they evolve quickly. And their eggs are about the size of pollen. Probably back in the Permian, they got very adapted to the very dry, desert-y climates at the time. And they just developed this incredible ability to land a few eggs in a puddle, go through their entire life cycle in six weeks or even a little less, and then when it dries up and turns, the dust starts to stir up in the wind, the eggs are in the dust and blow—even today, they blow a thousand, 1500 miles at a stretch if the conditions are just right. So they spread all over the Triassic world. It pretty much splits at the northern hemisphere and southern hemisphere because the winds don't cross the equator too much. But all around the paleo northern hemisphere, you can use these conchostracans to do a lot of detailed stratigraphy in Triassic.

And the Culpeper Basin was very friendly to the conchostracans, apparently. There are a lot of them [unclear]. And there were a number in the Manassas Battlefield park. So when I first got involved, there was a man from Hungary named Heinz Kozur. He came over. And working with him, he convinced me that this was a goldmine of information. So I got big on helping him collect it. And we, with the park's permission, we went down, let's see, I guess it was 29, 29's the one that goes to the park, right?

Santucci: Yes. Mm hmm.

Weems: Yeah. Particularly through there, there are those road cuts up and down the line. We got in there and split through the red and gray shales and got a whole bunch of stuff. And got a very nice collection which, being on the roadsides, the park at the time agreed that that could be counted as highway property, rather than park property. So we ended up putting the collection in the Smithsonian. But it was a very valuable collection for the stratigraphy in the Culpeper Basin. So the conchostracan collections come from that. That was a little after the quadrangle mapping effort. But it was a direct result of it.

Santucci: Very good. And then you were able to also find some vertebrate footprints in the Bull Run Formation?

Weems: Yeah. Not so much in the park. We got a few small footprints from around the edge of it. That one paper I sent you on Culpeper Basin documents the ones that are not in the park, but they're not that far outside of it. But the big footprint discovery in what some people still call the Bull Run, I call it the Groveton Member, is down at the Culpeper Quarry in Culpeper. Although those beds are correlative with the ones with the ones that are in the park. It's the same part of the column. So it's information on the same chunk of time. But the quarry, as it turned out, they opened up a huge surface. It's, it used to, originally it was red and gray beds. But there was a huge body of magma that pooled up nearby. It's like a big blister. And today, if you drive down Route 3 east of Culpeper, you'll go by it. It's called Mount Pony. It's a big body of basalt-y

magma. And it cooked everything in the quarry area. Because the red beds are kind of crumbly. But once it got cooked, it was like firing China. It really hardened it up and turned it into a tough road metal. So they were in there blasting down layer by layer, looking for, well, just getting ground stone for the roads.

And when I was still back at George Washington, one of the students at the time had gone to this quarry and said that it didn't have what he wanted, but it certainly had a lot of strata in it and maybe I should go check it out. So I went down there one weekend. And at that time, this was like in the late, well, maybe early '70s. Well, mid-'70s. And things weren't so touchy and dicey about getting into places. I just kind of drove in there. Parked on the one surface that was pretty well exposed. Looked around. I guess three or four hours. It was kind of a warm day. Didn't find a thing.

And then I was heading back to my car, feeling very discouraged and disappointed. And it was getting to be just about sunset. And all of a sudden, when I stopped the car and looked around, I noticed there were these little round, shadowy pockets, and they were in zig-zaggy shapes, running across the surface of the rock I'd been walking around all afternoon. And I got down and looked at it really close and realized that they were footprints. I'd been walking around on them for three or four hours, and never seen a one. (laughter)

So I got in contact with quarry people. And they let me come in. I've always made a point of, as the saying goes, not biting the hand that feeds you. I tried very hard to not make any trouble for them, and go at times when I wasn't bothering them. So they let me do the one project up on that one level. And I got that published.

And then some years after, when I'd got into the Survey, the quarry manager called me up and he said, "One of our guys here thinks he's found some more footprints on another layer."

So I went down. And sure enough, they had blasted down a lot farther than when I was there, I guess it was ten years earlier. And they'd opened up a whole new layer. And that one had just really nice footprints all over it. So they let me back in. And it was a big area. I mean, it was like, I guess, several acres. And the very first thing we did was we, I had people help me. Went in there and we set up a system of painted grids. And we did them at, I think it was, I can't even remember at this point. I think it was like—I can look it up—at fifty-foot intervals. And we did a series of east-west and north-south lines, turning into like a huge chess board. And then we, I set up a numbering system so that each quadrant in the grid board had a number and a letter designating it. It would start, say, from east to west. So it would be 1 West, 2 West, 3 West, 4 West. And 1 North, or 2 North, 3 North, 4 North. Anyway, each one was unique.

And then we went in there over days and weeks and months. Cleaned off one of the squares. And circled all the footprints in there and took measurements and I made a sketch of it. And we bit by bit put the whole thing together into a huge compilation.

And that paper I sent you on Culpeper, it's in four sections because it's so big. But I have that set of four figures of the quarry, in four quadrants, showing where the footprints are and how everything's going. So that turned into a huge treasure trove of information. And that last paper I sent you on the main dinosaur in there, this thing, the footprints we call Kayentapus minor. Made

by some sort of a—for the Triassic—a good-sized carnivorous dinosaur. I think it was like this thing from Germany called Liliensternus. And it left about 1500 footprints or so. Following it around on that surface, I was able to actually piece together a pretty good idea of what its behavior was like and its hunting strategy and some other things. And that was the last paper, it will probably be my last paper on that quarry. But that was really just a wonderful opportunity to kind of get to know a dinosaur. (laughs)

Santucci: Yeah. What a great story. I first learned about it when I was at Petrified Forest. Ron Litwin had shared some news about it. And hearing that there were impressions of phytosaur belly, pretty exciting to hear about. Is the area also referred as the Martin Marietta Quarry?

Weems: I think so. I think, at the time that I was working there, it was owned by a local company in Culpeper. The people who ran it were Culpeper residents. They then sold it, I think it's been sold and resold two or three times. I think Vulcan, maybe, and Martin Marietta both. I'm not even sure right now who's got it. But yeah, it probably has been known as that.

Santucci: And I understand that you worked with Carnegie Museum as well to document and to make some casts of some of the ichnofossils?

35:28

Weems: Well, the main connection with Carnegie was Ron Litwin did introduce me to people up there. And when I got this idea that the track makers of Eubrontes tracks might be Plateosaurus, I found out, I forget exactly how, that they had a casting of the individual bones of a footprint of a Plateosaurus from Germany. So I was able to arrange to borrow that. Ron brought it down to me. And I put it into a huge wad of clay and set it up the way I thought it looked when it was in life position. And it worked out well enough that I did a latex over it and made a mold over that and then disassembled it. In the end, I pulled all the bones out and polished them off and Ron took them back to Carnegie. So that was the main direct connection to Carnegie. But I then used that foot casting to make a case that Eubrontes was the footprint of a Plateosaur, not a carnivorous dinosaur. So that was the main connection there.

Santucci: Very good. Yeah. That must have been a tremendous discovery going through the quarry systematically and determining what was there.

Weems: Yeah. And I'm really glad I made that grid system. Because you know, over time you work a few here, a few there, a few there. I was able to take them piece by piece and reassemble them, kind of like a jigsaw puzzle. But if I hadn't done that, the organization of it would have just been lost and then a series of disconnected trails. But as it is, we ended up being able to get a real geometric perspective on it.

Santucci: And it sounds like you had good cooperation from the quarry operators supporting your work.

Weems: They were superb. I can't speak highly enough of them. It was a combination. You know, they appreciated science. They thought it was really great that their quarry was doing something beyond just making a living for them. They also thought it was great that they were putting Culpeper on the map in terms of its importance in the greater world. And so they were

just, they were ideal people to work with. They really were. And if I needed something cleaned off, you know, I'd ask very politely. But they always would get in there and sweep it out, or use the bulldozers to push the heavy stuff off. It was just wonderful.

Santucci: So when you were doing that work, it was pre-photogrammetry, the 3D modeling. And so today, if that was the discovery that was made now, one of the first things we probably would want to do is to get the photogrammetric images of a lot of those trace fossils.

Weems: Yeah. Yeah. That would have been the thing to do. But unfortunately, most of them are gone. Although there are some. Particularly the Kayentapus trackway. There's a set of two down in Martinsville, Virginia museum. There's two in the floor in USGS. Smithsonian somewhere has two. There are two on exhibit at Culpeper Museum. So that's at least eight tracks there. I'm pretty sure there are others that they probably scouted out. So it might be possible to pull together maybe fifteen or twenty of those tracks. And we do, of course, have a lot of plaster castings I took over the years. So there's something that perhaps could still be done together. But yeah, it's a shame that those two things didn't cross in terms of time of development and time of exposure.

Santucci: The phytosaur body impressions, those were impossible to collect. Is that correct?

40:03

Weems: One of them we didn't. One, we got down there. Ron got this idea of using this special plastic stuff. And he got some funding through P&S to purchase it. It's not cheap. And he and I and [Manstarica?] went down. And we cordoned off a rectangular area around the body impression and poured the stuff in and let it set up and it seemed to work pretty well. Ron rolled it up and made off with it. And I guess he's still got it. I don't know what he did with it, but a copy of it was taken. I did do a sketch I made of it, which is in that Culpeper paper.

Santucci: Right. Mm hmm.

Weems: Yeah. But that was about it for what we were able to do under the circumstances. But yeah, there were two, and one really nice, which is the one Ron cast. Another one that was good enough to, well, I have it on the map roughly shown, the shape of it. But yeah, they were at that point when it was underwater, they would get down on the bottom and plop down and rest there for a while. And when they took off, they left a, more or less a body impression. Though it also had aspects of the dynamics of, like the one that I sketched. You know, the rear feet show up prominently because it kicked off and made these sort of puddle marks as it took off from where it was sitting there. But it was spookily like you'd just been there right after they'd been there.

Santucci: Yeah. It's an amazing, amazing discovery. Any remnant of scales or skin impressions?

Weems: None that I recognized.

Santucci: Okay.

Weems: The metamorphism, I think, may have took some of the really subtle things out. It wasn't bad. But you know, things about, anything down to a half a millimeter scale, I'd say, was

in good shape. But below that, it started getting fuzzy. And it was a drying, wetting drying situation. And of course that wetting drying situation tends to degrade things pretty quickly unless you get real lucky. But I never, it was nothing like that lizard foot that Paul Wilson had on the cover of *Science* ages back. Nothing of that quality ever seemed to show up. Or if it did, I didn't see it.

Santucci: Okay. So the paper, your 2018 paper, the synopsis of the vertebrate fauna from Culpeper Basin, when I see that, the first thing that comes to mind is we need the same thing done for Gettysburg Basin. (laughter)

Weems: Fair enough.

43:09

Santucci: So by saying that, I've done some historic research, and I'm happy to share any of this with you, relative to the tracks that are in the stone bridge on South Confederate Avenue. And there are some really interesting archives that the National Park Service maintains at the Gettysburg National Battlefield visitor center and their museum related to what went on during the 1930s and the decisions to actually intentionally incorporate the vertebrate tracks on the capstone of the bridge. There was consultation with the Smithsonian at the time. The superintendent, the project engineer were all involved with discussions with the person that was operating the quarry. The quarry where the stones came from is called the Trostle Quarry. It's in York Springs, Pennsylvania. And I can send you that locality information if that would be of interest to you. But there's lots of records, newspaper clippings, etcetera, contemporaneous with it, that if you're ever interested, I'd be happy to share with you.

Weems: Yeah, sure. I mean, the Gettysburg Basin is one that does interest me. And you say it's not been paid as much attention to as it deserves. I do have, I mentioned to you by email, that I did work in a quarry over in Fairfield. Do you know where that is?

Santucci: Yes. Oh, yes. Mm hmm.

Weems: Southwest of Gettysburg. There's a big quarry there. And some sharp-eyed person there spotted footprints. And the material, it's a carbonate. And it's been metamorphosed. It's really pretty much a marble at this point, but not too badly recrystallized. And we got, uncovered a pretty good-sized area. I guess it was 100 by 50 feet. It had a bunch of little footprints all over it. And then there were a few others that were found. But it's a pretty typical Triassic fauna. There's phytosaur material, brachychirotherium. It's separate, but there's an *Atreipus* handprint. And other little prints are either *Atreipus* or Grallator. And rhynchosauroides. Because there was some question, originally Stose mapped this part of the Gettysburg Basin, but then later some people said it was right close to the Frederick limestone belt, and maybe it was an inlier of the Frederick limestones. And so they were arguing that it was actually Cambrian or Ordovician. But the footprints, and of course there was no way to do it with microfossils, because the metamorphism had destroyed all the micro stuff. But the footprints were big enough and tough enough that they clearly said, nope, this is upper Triassic stuff. So that's something else that should go into this compilation.

Santucci: Yeah. And so these are all Norian, is that correct?

Weems: No. Although the ones we've been talking about are all Norian. But I guess I should have sent you that, too. I have done, along with Spencer Lucas and another fellow, a revision of the stratigraphy of the Newark Supergroup. And it's, I think it's an interesting situation and probably one that graduate students in stratigraphy ought to read the two versions. Because it's kind of a conceptual divide. The previous work on the Newark Supergroup has pretty much been to create a stratigraphy for every basin, and to make each basin its own story. And what we did was to take, largely because of the conchostracans, but with the other things, we were able to get a fine enough lateral continuity to the stratigraphy that we were able to correlate things all the way from Fundy down to the South Carolina border. And we ended up putting together a regional stratigraphy, more like you see out west with the Colorado Plateau or the Rio Grande roof basins where the stratigraphy carries across the individual features. And so at this point, there's sort of two perspectives. People, recently David Brezinski and another lady, I don't know her, did a paper on the Jurassic basins of Maryland, including Gettysburg. They've stuck with the old every basin gets its own stratigraphy concept. But at any rate, I'll send that along to you.

So anyway, with Gettysburg, once you get the stratigraphy really sorted out, the lake beds, and there's that area—it's not in my head at the moment—but there's a place up in the eastern part of the basin where there was a big phytosaur that came out and a metoposaur. At any rate, that, based on the conchostracans we got out of there, that is the Upper Ladinian. I mean, it's got the same conchostracan fauna. And I was able to track it down in Maryland as far as a little south of Emmetsburg, where it pinches out. So, there is that. And above that is the Norian. And down below it is a lot of what's been called New Oxford, it's basically the Stockton, or a thinning southward version of the Stockton. And then below it there's this sliver that has conchostracans, that's older. Something, David actually did keep that – I call it the Irish Town Member. And it's at the basin. It's actually early Carnian. It's more related to the stuff around Richmond.

So, Gettysburg has a lot more variety in it than was previously appreciated. But above that lake interval, all of that is Norian. Yeah, all is Norian up until that one little place where they have that basalt around Aspers. And that's Radian. That part's Radian. But most of the tracks and things are Norian. And the second most abundant would be the metoposaur and phytosaur things and the fish remains out of there, which are Upper Carnian.

50:24

Santucci: Excellent. So, I think there's, if you're looking at the Gettysburg Basin from northern Maryland up into Pennsylvania, there's probably at least six known sites that have vertebrate trace fossils from the Norian. And then there's rumors of several others that also have produce tracks. So it's probably worth a little bit of focused attention. And I think that, you know, it's going to have a pretty interesting story. Historically, the earliest reports of fossil vertebrate tracks from the Gettysburg Basin are actually associated with some faculty at the Mount Saint Mary's College. Are you aware of that?

Weems: Okay.

Santucci: Are you aware of that?

Weems: Probably not. I mean, the oldest stuff I'm very familiar with are some of the old USGS reports.

Santucci: Yeah. So—

Weems: They have had photographs of footprints from York County, I guess it was? Anyway.

Santucci: Okay.

Weems: But these sound like they're older.

Santucci: Yeah. From the 1890s, there are some local reports that some of the faculty at the Mount Saint Mary's Museum actually encountered some of these Triassic footprint producing units. And they made some collections of slabs that are actually on campus now, that are part of the walkway outside of one of the buildings. So there's a historical collecting of one that dates back to the 1890s that continues on. But there's enough rumors out there of additional sites that I think a more intensive examination of these areas would tie together to a much more robust story for the Gettysburg Basin. I think it's rick already, but I think there's more to be learned. And so my question to you is, you had mentioned that in the Culpeper Basin, you don't have many or any *Atriepus* tracks? But that we're finding them in the Gettysburg Basin.

52:45

Weems: Yeah. I told you in that last email that I have—issues is too strong a word—puzzlement over you know, if there are no handprints, and he did have actually a footprint, how do you tell an *Atriepus* from a Grallator.

Santucci: Right.

Weems: But that's, you know, that's another problem. It was interesting to sit in this Fairfield Quarry, which it would be pretty high up. That really did look like an *Atriepus* handprint. And some of the work in the Newark Basin indicates that it does range up pretty high up in the Passaic [Formation] there. But so far in the Culpeper, I'm not seeing anything that I would, I don't think, have not seen anything that I would want to call *Atriepus*. But there's not that much volumetrically towards the bottom. I wouldn't be surprised if it showed up at some point.

Santucci: You're absolutely right in terms of the different between Grallator or *Atriepus* if it's a facultative behavior that allows them to occasionally put their manus down where it's absent and Grallator. It might just be a behavioral thing. But I wanted to ask you, is it possible that there's a paleo-biogeographic explanation to the presence or absence of certain vertebrate ichnofossil types within the basins?

Weems: I've wondered about that. One of the interesting things is that in the Gettysburg Basin, Don Barrett published on this ages back. There's this track he, well, it actually goes back, it was illustrated in, I think, that York County volume. But he thought, and it looks to me, like it could

well be a big [disaunadon?] track. And I'm hoping it may be at the Carnegie somewhere. I've never had occasion to try to run it down. But yeah, that really looks like it might well be there.

There's another one. I put it away. One day we were up there near, it might have been York Springs area. And I was with Heinz. And we were collecting conchostracans. And I popped open a block with some little footprints. And I swear I think it was an amphibian footprint. Anyway, to make a long story short, and it's very iffy at this point, I kind of get the sense that perhaps the Gettysburg Basin was a little wetter than the Culpeper Basin. And that there may have been things hanging out there that it was just a little too dry and a little too desert-y in Culpeper for them to be happy there. But that they were timewise coexisting, but there was—well of course the other thing, like you get that big, oh, what's the name of it? That big conglomerate that sits on the west edge of the basin? It will come to me. But it's chockablock full of Paleozoic things. So it looks like the Gettysburg Basin had a pretty good-sized stream or river flowing into it from the west. And anyway, it's kind of a thought in progress in my mind. But I wonder if Gettysburg might be a wetter environment, and therefore have some wetter things in there that just don't show up down at Culpeper, even though it's age-wise the same.

Santucci: Interesting. Yeah, definitely more work needs to be done in the Gettysburg Basin.

56:45

Weems: Yeah. Yeah, I'd certainly be interested. How do you get along with Spencer Lucas?

Santucci: Oh, well. I know Spencer from when I first started with the National Park Service at Petrified Forest. And so he was doing work with Adrian Hunt and some others at the park. So I've known him since the early '90s.

Weems: Yeah. He's a person that, like a lot of people who do a lot of things. There are people who blow really hot and really cold about him, but he's been nothing but good to me.

Santucci: Yeah.

Weems: And anyway, I kind of promised him after I did the Culpeper one that if I did something further, that we would get together and do a synopsis of the biostratigraphy of the Newark. And I don't think Gettysburg would be out of the realm for a separate sub-project. But if you were willing, and you wouldn't mind having me and you and him go to together on a Gettysburg thing, I think that might be a very doable project.

Santucci: Wow, that would be fantastic. I would greatly appreciate that. So, yeah, I've worked with Spencer on quite a few projects. I realize that there's some controversy with Spencer and some people. But I've never had a personal problem with him. And I greatly appreciate that he publishes the New Mexico museum bulletin. It's an outlet to get, you know, a lot of different diverse papers published where there aren't other good outlets.

Weems: Yeah, well, a lot of what I've done is in there.

Santucci: Yeah. So I would be happy to pull together, and I can scan everything that I have for the Gettysburg Basin as it relates to Triassic trace fossils and set up a shared box or file or something. That way, you can access all of that stuff.

Weems: Yeah. Okay. Well, that would be great. And maybe if Covid thing will finally blow itself out or if I can [unclear] if I ever actually get around to getting my shots, maybe spring or summer we could get together, even.

Santucci: Oh, that would be great. If you were able to come up, we could start by going to Mount Saint Mary's College. Show you the fossil footprints in a cultural resource context. And be happy to show you a couple of the localities that I'm aware of.

Weems: Yeah, okay, that sounds great.

Santucci: Perfect.

Weems: Yeah, it's not that far up there. Well, you know, from the other direction. But yeah, I could wind my way up there now. Total different context. And it doesn't mean it has to wait. But Spencer has made noises that next fall he might be interested in coming back this way and doing some field work. So we might even be able to get him to look at a few things. But it doesn't mean we have to wait for him.

Santucci: Sure. Absolutely. And you know, if you're up here and you needed a place to stay for the night, we have an extra bedroom that you'd be welcome to stay in. Of course, the same to Spencer. My wife's a pretty good cook. That wouldn't have to be an expense if you wanted to stay a night or two and do some field work.

1:00:27

Weems: Yeah, I definitely, I'd love to take you up on that.

Santucci: Great. And we have a trilobite swimming pool in our backyard. A trilobite-shaped swimming pool that if it's it the right time of year, you can take advantage of that.

Weems: (laughs) Okay. Well, that's a good reason to come after the water warms up. But it doesn't have to be the only time.

Santucci: Did you want to reach out to Spencer initially? Or should I do it? How do you want to approach that?

Weems: Either way. I mean, what would be your druther?

Santucci: Since you've been working with him, if you don't mind doing it, that would be great.

Weems: Oh, okay. And I'll cc you on it so it will be all aboveboard.

Santucci: I appreciate that. Thank you. So, let's see. Beyond the Gettysburg Basin, there was one small question that I had from your paper. Figure 1 in the 2018 paper is a really nice regional

perspective of the Newark Supergroup and its distribution of these basins. At the northeast end of the Gettysburg Basin, you have something called the narrow neck of the Newark Gettysburg Basin. Do you know what's going on there?

1:01:53

Weems: Yeah, that's not my name. That's not my name but yeah, I remember that.

Santucci: Do you know what's going on there? Is it just a structural anomaly?

Weems: Well I think part of it is that there is that stream apparently that came in from the west and built up a big gravelly delta there. The fact that it's a narrow area suggests that there are two separate depazones. Although the stratigraphy—I'll be sending you the new paper—but they said you can track the Stockton [Formation] and the Lockatong [Formation] and most of the Gettysburg is really the Passaic [Formation]. So the stratigraphy is fairly continuous. But it is interesting that that is where it goes over. There's some sort of a structural sub-basin status there, if nothing else.

Santucci: Okay. Let's see. You've also done some paleoichthyology work as well. is there anything of interest related to national park areas, or in proximity to park areas?

Weems: Okay. Let's see. So I just sent you off that other thing. Sorry, what was the last question?

Santucci: Oh, you've done some work with Triassic fish.

Weems: Yeah.

Santucci: Anything in association or in proximity to any National Park Service areas?

Weems: Not right off. I wouldn't be surprised, especially those layers in Manassas that Pam Gore did her thesis on that had a rather diverse fauna. And actually some of the stuff with Heinz. We did get a few fish scales. So there's nothing, so far I haven't seen anything like these nice fish impressions. But there are fish remains there at least in parts of the section. So it's a sleeper at this point. I think if some of those shale [unclear] 1:04:29 maybe could, if some excuse to break into them and split them up a bit, something might show up. But not at this point.

Santucci: Okay.

Weems: There was that really good fish bed at, I was going to say [Benlovian?], it's not that. Midland. The Smithsonian has a bunch of things from that. But it doesn't really relate to anything in the Park Service realm. There's so many bits and pieces to the Park Service that I may be missing something. But nothing comes to mind.

Santucci: One Park Service area that's sort of a surprise, just because it's such a long, linear park. And that's the Chesapeake & Ohio Canal National Historic Park.

Weems: True. True.

Santucci: Dave Brezinski and John Repetsky have done some work there on the Paleozoic. Since it spans such a long area, have you encountered any Triassic along C&O Canal?

Weems: Yeah, it's there. The very basal part of the, whatever they call it up there. The conglomerates, the sandstone, the Manassas sandstone, is up along that stretch. When you come—it's been too long. When you come down onto the trail and you come out from the east going west, into the basin, up on the side of the bank. It's back a ways, you see it better in the winter. But there's some nice long exposures of Triassic sandstone there.

Santucci: Okay.

1:06:19

Weems: So that's some there. If you get further in, that's where it tends to get kind of low, low relief. But I haven't really, don't remember checking too much. Like up around, oh, Point of Rocks, you know, just before the canal crosses into the Blue Ridge terrain there, there probably ought to be some stuff along the west side of the basin there. That's fairly sandstone-y. But the other parts it tends to grow over. Because it's silt stones and shales and it just doesn't hold up.

Santucci: Right. Very good. And just thinking broadly beyond just the Triassic. Have there been any other National Park Service areas that you've done any official work or unofficial work that might be of interest?

Weems: Nothing's coming to mind right away. But I'll think on it. There are a bunch of places. The question is, what parks would be nearby?

Santucci: Sure. So you'd mentioned before we started interviewing some recent discoveries at Fredericksburg/Spotsylvania National Military Park.

Weems: Yes, yes. That's one. There's a fellow down in Fredericksburg named Jon Bachman who, he came to help me at Culpeper for a while. Then he went back. He had a summer he was teaching. He was supposed to do something for educational credit. And he talked his people in his county into letting him come help me measure footprints over the summer as his on-hand science experience. Which worked fine for him, worked fine for me, because he did a lot of good work. Then about six months later, he contacted me and said, "I think I found a footprint here in Fredericksburg." I was like, "Oh, yeah, well, maybe". So I went down. Sure enough, he had a footprint. Several of them, in fact. Got a little paper out on that. And then some years later, we went down on the river and found a bunch more. But that said, Fall a year ago, I was over at the headquarters for Fredericksburg Battlefield, over just to the north edge of Sunken Road. And I was out looking at the stones. And the Sunken Road, there's a sort of original part and the rebuilt part. Rebuilt part is all metamorphic stuff. But the more original part, which is towards the west side, there are a lot of sandstone blocks in there. And there are sauropod footprints and phytosaur footprints, iguanodon footprints. Do you deal with that park? Or does somebody else?

Santucci: Well, yeah. My position deals with any national park that has paleontological resources. I think I know who the current superintendent is there, and she has a natural resource background. So she might be very interested in learning about this.

1:10:00

Weems: Yeah, well, I mean, I'm not – I don't want to [unclear] anybody out. But I was thinking if you had occasion to get down this way, maybe I could show you that stuff. And if she's interested, you know, do a short tour down the line of it, and make a note of where they are in the wall. But they – one of the other reasons it hadn't worried me too much about it is those blocks are pretty big. It's not like anybody's going to go in there, pick it up, stick it in a satchel and walk off with it. But on the other hand, you know, it might be worth it to make some latex copies of them, or latex molds and copies. And maybe put a little exhibit somewhere sometime on the footprints of the battlefield. Or even do something in the wall, though that might, to some people, take away from the original aspect of it.

Something else that's shown up in that wall, there are a lot of brachiopods in there.

Santucci: Oh, wow. (laughs)

Weems: And I think they must be from the Devonian somewhere. And that would be something. If somebody in the park could see if they could try to track down—

Santucci: Sourcing.

Weems: —where some of that stuff came from. I mean, it looks to me like Devonian stuff. And I kind of think it might have come out of Pennsylvania.

Santucci: Wow.

Weems: Which of course would imply that the railroads had something to do with carting it down there. But that's another, so those are two paleontological projects, I guess you could say, right in that Sunken Road stone wall.

Santucci: So it sounds like that there's obviously at least two sources for that stone that's in the stone wall there at the Sunken Road.

Weems: Yeah. Yeah. And quite different. Not like two quarries in the same neighborhood. It's very different places.

Santucci: So if there are brachiopods that are identifiable, particularly to a particular formation, we can look at all of the geographic possibilities of where that formation is exposed near Fredericksburg.

Weems: I don't know of any place that close. Well, relatively close, yeah. I guess we could take some photos. Maybe Robert would be able to give some idea on – because he's big on brachiopods, right?

Santucci: Yes. He'd be a good source. So it sounds like what you're observing is both Devonian and Triassic rocks that are part of that stone.

Weems: No, Cretaceous. Cretaceous.

Santucci: I'm sorry. Cretaceous. Okay. Yeah. Oh, wow. That's interesting. And for the Cretaceous, the vertebrate trace fossils. It sounds like what you're saying is it's more than one occurrence; you've seen multiple.

Weems: Yeah. There's a lady down there, Jerilyn McGregor. She was kind enough to share with me some work she did pulling together all the records she could find of old stone quarries in the Fredericksburg area from pre-Civil War days. And there were a number of places. That whole [Tuckson?] outcrop belt. Apparently, in fact it's a little bit ironic. The reason there isn't more rock downriver from Fredericksburg is because they quarried most of it out. And what's left over grew. But there was a belt through there where they were getting stuff. And of course there's that other area up in Stafford called Government Island. I think that's a county park. Footprint has show up-up there, too. A little sauropod. So there's a whole Lower Cretaceous [Tuckson?] Formation story. I'll send that one along to you, those along to you. (laughs)

Santucci: Okay. So the—

1:13:59

Weems: But the ones in the park, almost certainly they're from somewhere around the Fredericksburg area.

Santucci: Very, very interesting. This is all new news to us. So I'm thrilled to hear this. And I just checked. I know the superintendent at the Fredericksburg-Spotsylvania National Military Park very well. and she does have a natural resource background. So I can send her an email and say we spoke, there's some exciting things. And perhaps when the pandemic's behind us and the weather is better, we could meet and take a look and document these sites.

Weems: Yeah. I think that would be really good to do. You know, of course, you know, you guys would want to know about it. I'm kind of sorry that I didn't do it earlier. But once the stroke hit and then the pandemic hit, I'm way behind on—the good news was that I've gotten a lot done that was stuck in my computer in the files. Bad news is that things actually happening, I've just gotten really, really behind while I've been kind of down and out. But hey, as good a time as any to start it up again.

Santucci: Absolutely. So thinking about the Triassic tracks at Gettysburg and these potential tracks that exist at Fredericksburg-Spotsylvania, it brings to mind that long before the footprints of Union and Confederate soldiers marched across the battlefields at Gettysburg, Manassas and Fredericksburg, dinosaurs left their footprints in mud. (laughs)

Weems: Yeah. Yeah. And of course, for all of the wonder it is we've got what we've got, it's a little sobering to think of, that's probably, what, maybe 2, 3 % of what all actually went on?

Santucci: Oh, yes. Wow, this is great. Very exciting news that you've shared with us.

Weems: So actually I'm very glad you called and brought it back to the front of my mind. Because yeah, I really do need to get back on that. And I don't need to do anything solo at all. It's always better with help.

Santucci: Absolutely. So, I guess before we wrap up here, is there anything that I haven't asked you that would be worth discussing?

1:16:46

Weems: (laughs) Nothing that comes to mind right off. Well, I guess one thing real quickly. Going back to Fredericksburg for a moment. There's a place that's run by Mary Washington College. It's Gari Melchers' art studio. On the north side of the Rappahannock.

Santucci: Yes. Mm hmm.

Weems: Are you familiar with it? Have you ever been there?

Santucci: I have not.

Weems: Okay. Well, I was there one time. My wife's sister-in-law is an artist. And so she came, my wife's from Taiwan. Her sister-in-law came to visit. So I said, well, this is an art studio. Let's take her. She actually liked it. But while we were there, I was walking around on the sidewalks and danged if there weren't dinosaur footprints in some of those stones.

Santucci: Oh, really? (laughs)

Weems: So that's another place where, you know, it's not Park Service, but it's a public place. And they've actually kind of gotten fond of their dinosaurs. (laughs)

Santucci: Well, that's interesting. Just a side note, my daughter, who's an undergraduate in parks and resource management at Slippery Rock University, she has a minor in archeology and cultural resources. So she just has her first published paper. It's in Spencer's volume, by the way.

Weems: Oh, okay.

Santucci: And it's looking at occurrences of fossils within prehistoric and historic structures. And so I wish we would have known about the stone wall in the Sunken Road, because that would have fit in there.

Weems: Yeah. Well now, in one of the ones I'm just going to send you now, I do have a paper, an update on the Cretaceous stuff at Fredericksburg. And there is mention, not of the sunken wall. I didn't want to say anything until I actually talked to somebody there. But across the other side, on the wall in front of the Mary Washington president's home, a footprint came out of that side. Then there are the ones at Belmont. And these are in this paper. So their cases. And I also got into where the stones came from originally down the river. So, yeah, your daughter probably, and it's in the same volume, I'm quite sure. Or you can send her this one after I send it to you. And I'd be interested to see her paper.

Santucci: Absolutely. I'll send it to you.

Weems: But, yeah. Yeah, well, better late than never.

1:19:14

Santucci: Definitely. It will give the incentive to do a second version of it down the road as new information comes forward.

Weems: (laughs) Hopefully it will keep coming. But yeah, it's just a matter of – the older things, I've been doing some looking around downtown Fredericksburg. There's a place where the Union troops came across Rappahannock and went up through this sort of a slot between two stone walls to get up to the plain that led over to the Sunken Road. And there's some suspicious looking things in there. There's some other stuff. So anyway, there is some stuff. And maybe it would be worth putting out something on the national park specimens, too. But anyway. Yeah. More to come.

Santucci: Absolutely. Well, I can't thank you enough. This has been a really interesting and valuable conversation.

Weems: Both ways.

Santucci: I'll follow up with some of the things that we talked about. And I'll look forward to hearing back from you.

1:20:26

Weems: Okay. And let's see. Just to make sure, I'm to email Spencer, right?

Santucci: Yeah. I mean, I can do it. Either way. But perhaps since you've already had a conversation with Spencer, to keep it in that context.

Weems: Yeah. Okay. Sounds good. Just wanted to—I hate getting in the situation where, "I thought you did it." "No, you said you did it." (laughter) Okay. So anyhow, great talking with you. And I guess we'll be getting together sometime when life gets back to sort of normal.

Santucci: Yeah. I look forward to that very much.

Weems: And, you know, we can go either way. You can come down to Fredericksburg or I can head up to Gettysburg. Whatever happens to come first.

Santucci: Or both.

Weems: Or both. Well, it's kind of pointless. If you come down to Fredericksburg and I go to Gettysburg, I don't think that's going to work as well. (laughs)

Santucci: True.

Weems: But it would be, yeah, not exactly at the same time.

Santucci: Sure. Well, thanks again for everything. And stay healthy and keep warm.

Weems: Yeah. So far, so good. We haven't lost any power yet. How about you?

Santucci: No. We're good as well.

Weems: Okay. Well, hope it stays that way. And stay well.

Santucci: You, too. Thank again.

Weems: Talk to you soon. Bye-bye.

Santucci: Bye-bye.

1:21:44

[END OF INTERVIEW]