

Charles O. Adams

Oral History

Kate Hagenbuch: Say your name for us.

Charlie Adams: Charles Otterbein Adams.

KH: It's October 16, 2009 and Kate Hagenbuch and Mark Martel are interviewing Charles Otterbein Adams at his home in Dayton, Ohio.

The Partnership for a New Generation of Vehicles was started in 1993 between US automakers and the government. How did you get involved in electric cars?

CA: I had been involved in electric cars for a long time before that. I talked to the Barn Gang about it a couple of times. I don't remember exact years. I helped start the Barn Gang in 1992, the present Barn Gang. I knew quite a few of the original Barn Gang because of my association with my father; he was Charles Kettering's Private Secretary when General Motors separated the Dayton Engineering Laboratories Company from DELCO itself. They moved the laboratory down to Moraine City and to the old building that was the original Dayton Wright Aircraft Company building. In fact, Dad took me down there, this was probably when I was twelve to fifteen years old, something right along there, and dad would take me down there on Saturday morning when not too much else was going on, and I saw quite a few of the things that the original Barn Gang was working on. In fact Tom Midgely showed me the, he had mounted a gasoline engine, a regular internal combustion engine, on a concrete block, and it had two gas lines going into it with petcocks. It started on regular gasoline, and after it was about ready to knock itself off the block he'd switch the fuel lines from plain gasoline to this gasoline that had lead, and it quieted down right now. The only thing they didn't realize was the air pollution that would cause, at that time. But they eventually got rid of that too.

KH: So the Barn Gang worked on leaded gasoline, the original Barn Gang?

CA: Yes, tetra-ethyl, that's what I was trying to think of.

KH: What interested you in electric cars?

CA: Well, I had been interested in them ever since I was a little boy. At E.J. Brown Grade School, the Assistant Principal drove to work every day in a Detroit Electric, electric car. There were electric cars when I was growing up, in fact dad told me about the time of the flood, half the cars driving around Dayton were electric. There were a lot of them, in fact one was being made here in Dayton.

KH: How did those work?

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CA: Very well, but the batteries of that time would only carry them a maximum of about 50 miles. That's why the internal combustion regular gasoline engine took over, because the electric cars couldn't travel very far.

KH: How did they charge the batteries?

CA: They'd charge them up at night at home. In fact the one that our principal at E.J. Brown School drove would only go about 25 miles. The batteries weren't very good.

KH: What did they look like?

CA: Like most of the other cars. Quite a few of them were made by taking a regular car and substituting the electric drive business as motors for the wheels.

KH: This sounds like an old idea that's coming back.

CA: It does, it is, really.

KH: Do you think people are aware that the electric car existed in the--what decade?

CA: This goes clear back into the early twenties.

KH: Do you think people know that electric cars have been made before?

CA: I think most people do. If it wasn't for the slow development of the battery we would have had them driving around on the streets today. But as I say since you couldn't go very far at that time, they didn't take over.

KH: What interested you in the program?

CA: Just to get rid of pollution.

KH: Can you talk a little more about how the electric car would be helpful to get rid of pollution?

CA: Sure, because in the electric car there is no tailpipe. In the regular gasoline car you've got all kinds of pollution coming out the tailpipe. And that's what fills the air today.

KH: What was the design like that you and Chuck Dempsey worked on?

CA: Well, we took a Detroit electric car as kind of a model, and the ♪ [wait for clock to finish chiming]

KH: We'll start that one over without the clock.

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CA: Yeah, I've been interested in electric cars ever since I was a kid, because they were around when I was a kid.

KH: What was the design like that you and Chuck Dempsey worked on?

CA: We didn't have a model, we were just talking. As I mentioned we showed a picture of this Detroit electric car on this big board that we presented to the Department of Energy, and we were really disappointed that the judges didn't give it a thought. They were all artists, and they were all looking for the art part of it, and there wasn't any art in our part of the presentation.

MM: What was the engineering part of it?

CA: As I mentioned, we had drawn a circle of the city of Dayton, with a radius of the limit of electric cars at that time. Then we showed pictures of Rikes [the major downtown department store] and those kinds of places just statements that we could drive the car into the department store and shop from the car. We also had a picture of a charging station to which the driver of the car could pull up to it, and just pull in and plug it in by driving it in and charge it, while you were off doing something.

KH: Was it for the city of Dayton?

CA: Yeah.

KH: Where would the cars go in Dayton?

CA: They would go anywhere in Dayton, they would go in department stores, and the hardware stores, those kind of things. We envisioned a charging station at all those places, there was a place where they could park, where they could be recharging all day long.

KH: Tell us about the drawings or the models that you used.

CA: As I mentioned the models that we used were the department stores and the hardware stores and charging stations, those were what we showed on the board.

KH: You co-chaired Alt Fuels symposiums at the Engineers Club in '94, '95, and '96 with nationally known speakers and actual electrical vehicles on display, including the GM EV-1. What sort of response did you get?

CA: Quite good. We had speakers from the Rocky Mountain Institute, and, I've forgotten the man's name.

KH: What kind of public enthusiasm was generated from the symposiums?

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CA: We had quite a bit of interest in it. We had about 20-25 cars there, not all electric, in fact from Cedarville College those students were working on a propane car instead of gasoline, and they brought that one up. And we had some electric bicycles [chuckles].

KH: What do you think about the progress since then?

CA: Still too slow to suit me.

KH: What do you think about the Smart Car, and the Prius, and the new Honda hybrid?

CA: Hardy Trolander drives a Honda [Toyota] Prius, which is a hybrid, which has both. He gets about 50 miles to the gallon. So he's doing pretty well.

KH: In 1994 you received the Deeds-Kettering Award for outstanding contributions to the Engineers Club.

CA: I think that was primarily because of these three symposiums. That's hanging on my wall in there.

KH: What are you proudest of in your career?

CA: I think those three symposiums on the electric car.

KH: Did you spend your working career at Delco?

CA: Part of it. In 1947 I guess it was, Reber Stupp who was plant manager at Delco took a job with Byron Foy, who was Walter P. Chrysler's son-in-law, to go to Jack & Heintz Precision Industries, which was a war-born company in Cleveland making magnetos, refrigeration compressors, bearings, and electric motors. He asked Reber if he would come to Cleveland to be plant manager for this plant, and he agreed, and he took three of us from Delco with him, including me, and set me up as Process Engineer. I had charge of all work processing, and the plant layout. The only problem was the Board had been so used to just adding people when they needed to increase production, they wouldn't spend any money on improved equipment. In fact I made three trips to New York to talk to the Board about it, and they wouldn't agree to any of it, because they just wanted to add people. So eventually they lost out completely. Reber went into being in charge of some other manufacturing plants in Cleveland, and I went back into welding engineering and the selling process. I worked for National Electric Welding Machines Company which, they shortened their name to Newcor. I was instrumental with working with them and making automated equipment. Delco wanted me back because of my experience, and I sold them three lines that turned out tubular shock absorbers at a thousand an hour. So it was a pretty good line, I sold them three of those lines.

KH: What did you want to be when you were a kid?

CA: When I was a kid? Oh, goodness. Well, my folks had another couple that was very good friends, and this Mr. Dreehurst was the electrical inspector for the City of Dayton. But he also had a real good woodworking shop at his basement, so he taught me how to use all the wood working tools. And I made boats, and that sort of thing, just carving.

KH: How did you end up being an engineer?

CA: That's a long story. Mother wanted me to be a minister because her father was a minister. Dr. J. W. Hicks, he was the United Brethren of Christ pastor at Fostoria, Ohio but he also worked for the evangelical department of the United Brethren in Christ headquartered at the UB building downtown here. In fact he started quite a few UB churches in northeast Indiana and northwest Ohio.

KH: So your mother wanted you to be a minister, but somehow you became an engineer.

CA: Yeah, I preferred the engineering, science things, simply because I guess I had worked on so much of that when I was a kid. In fact, the man who was science teacher at Steele High School took me aside one morning, said because of what I was doing in his class, he recommended that I go to the University of Cincinnati, the electrical engineering department, which I did. I got my electrical degree.

KH: Cincinnati had quite a reputation for engineering.

CA: They have. Well the head of that engineering department was well known clear across the country, he was the one that started the co-op program. When I became interested in a new college at Yellow Springs, Antioch, I had to remind them that we'd had that co-op program for six years before that down at Cincinnati.

KH: I think that the engineering dean at Cincinnati inspired Arthur Morgan.

CA: Very much so.

KH: Did you know Arthur Morgan?

CA: I met him, but I can't say I really knew him very well.

KH: You knew Kettering.

CA: Well dad was first at Delco when it was down on First Street. Dad was Mr. Kettering's cashier, for the plant. He would walk downtown, get the entire payroll in

cash in a cloth bag, and walk back to Delco with it. You wouldn't do that today. But then when they separated Kettering's laboratory part, General Motors separated that and moved it to Moraine, Kettering took dad down as his private secretary. That's how I got so much, got so interested down there.

KH: I think you have a story about Kettering.

CA: He called me into his office one Saturday morning. As I walked in the door of his office something came flying at me that he threw at me. And I caught it and almost fell on my face. It was a baseball bat, but it was made out of balsa wood, very very light. [Clock chimes]

KH: We might have to start that one over. It's a good story and I'd be happy to hear it again, if you don't mind.

CA: Dad had taken me down there, as I mentioned on Saturday mornings, quite frequently. And one of these Saturday mornings, as I passed Mr. Kettering's office, he called me into his office. And as I walked through the door something came flying at me, and I caught it. I didn't realize what it was, but I did after I caught it. And I almost fell flat on my face, because it was so light. It was a balsa wood bat, baseball bat, made out of balsa wood.

KH: Why did Mr. Kettering do that?

CA: He had all kind of things that he did, just for the heck of it. He told me, 'just don't believe everything you see when you first see it, you have to look up the background.'

KH: Could you say that again?

CA: He said 'don't always believe everything you see first-hand, you have to look up the background a little bit.'

KH: Perfect.

MM: I've been reading about Kettering, and apparently he was not much of a manager. He wanted just to do the work.

CA: Oh, no, he expected others to do that.

MM: Like your father?

CA: Yeah.

KH: What was your father's name?

CA: Charles Winfred Adams. He was born in Xenia. In fact the house in which he was born, the back part of that was a log cabin. And it was a stop on the Underground Railroad.

KH: Do you remember the address?

CA: Yeah, but the house doesn't exist anymore. It's a mortuary now on that spot now. The house doesn't exist anymore.

KH: Mark's mother is from an old Xenia family, and of course we have the connection through the Hooven and Allison. My dad's ancestors are from Xenia, Harbines and so on. I didn't realize we had a Xenia connection.

CA: Your dad is a rope man.

KH: That's right. Just one last question. In 2003, you flew in the Wright B Flyer. What was that like? Tell us how old you were when you did that and what it was like.

CA: I was 93, I guess I was, in that there was an article appeared in the paper on that, with a picture of me in that plane. John Bosch and Hardy Trolander both contributed to give me that ride, and it was quite interesting, because you're sitting out in the open. The undulations of the plane, and the wind in my face, reminded me just how much the Wright brothers did in starting the airplane.

KH: Did you ever meet Orville Wright?

CA: Yes, he was a member of the Engineers Club. In fact, when Deeds and Kettering built the Engineers Club they turned the keys over to the Board of Governors and Orville Wright was the man from the Board of Governors who accepted that key to the building.

KH: How old were you at that time? You were about six years old, probably.

CA: That would have been 1918, I was six years old, yeah.

KH: How old are you now?

CA: 97.

KH: Do you recall any personal anecdotes about Orville Wright, from your time at the Engineers Club, or otherwise?

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CA: He was pretty much a private man. Unless there was some reason, you couldn't even get into a conversation with him. As I say, I knew him, but I can't say I knew him personally.

KH: Was there anything else you'd like to add about anything, about your life, or work, or any other stories you'd like to tell us?

CA: Well, when the roads around the country started getting too small for high speed travel, they started to build concrete roads. And in those concrete roads they filled in with steel grating. I helped design and make the steel grating at National Electric Welding Machine Company. I have a patent on part of that, eventually these gratings became too wide to fit on railroad cars, so they had to be folded over. So I got a patent on the hinge of that thing. You'd lay half of it down, and flop the other half on top of it, and it would go on the railroad car.

KH: Excellent. Did you have any other questions, Mark?

MM: Yeah, a couple. You mentioned your mother wanted you to be a minister with the UB, I wonder if you could talk a little about Bishop Wright vs. Orville Wright there. Did you have any interaction with him?

CA: Milton? Orville's father, Bishop Wright, yeah. Bishop Wright and my great-grandfather, Dr. J.W. ... I've lost it for a moment, anyhow my great-grandfather was associated with Bishop Milton Wright in 1899, the general conference, the United Brethren in Christ at that time wouldn't let any of their members belong to secret societies. In the 1908 conference, some of the pastors wanted to change the regulations so they could join the Masons. My great-grandfather walked out with Bishop Wright, because they didn't want to allow that. Mother told me later that he eventually rejoined the original United Brethren of Christ church but at the time Bishop Wright and about 40 or 50 other ministers walked out of the general conference because they didn't want to allow that.

MM: Did you ever run into Colonel Deeds?

CA: Yes, I knew him quite well. Dad had a cousin, Charles Rausch, he and his wife were Deeds' caretakers for his farm, which is located where Moraine Country Club is now. There was a farmhouse right in the middle of that, just about where the buildings are for the Moraine Country Club now. Dad's cousin would have Lois and Winifred, my younger sister, and me out a couple weeks every summer. In fact we swam in Colonel Deeds swimming pool. But we would roam over the farm and then relax in the pool.

KH: That was a unique pool, wasn't it? What was so special about that pool?



CA: It covered a pretty wide area. It still exists; it's still there. Part of it was very shallow for kids, and part of it was much deeper. Mr. Deeds turned that pool over to Arthur Morgan and they developed the, what's it called, when water comes out of the conduits from behind the dams, comes out with real heavy force, so they developed this device that throws the water back on itself and dissipates the energy before it's released.

KH: Is that the hydraulic jump?

CA: That's what's called the hydraulic jump, yeah.

KH: And that idea came from the swimming pool?

CA: No, but it came from three of Arthur Morgan's engineers who were working on the swimming pool, and used that pool to develop it.

MM: When you swam in that pool, was any of that stuff left there?

CA: This was long before that. [laughter]

MM: There's something I see right off Stroop Road, and I wonder if it's the pool, because sometimes when it's drained I'll see strange things at the bottom if it.

CA: Since it's not used very much, all kinds of things go into it and they just sink to the bottom.

KH: Are we wearing you out?

CA: Oh, no. [brief discussion on what next]

MM: Was your father a member of the Engineers Club?

CA: He was for a while, but that was only because of Mr. Kettering.

KH: Do you remember going to the Engineers Club when you were a child? What was that like?

CA: Yeah. Well, I was quite impressed with it. The basic design of that building is rather unique, but also it's very useful in the way it's designed. Deeds and Kettering did a good job on that.

KH: What's special about the design of the building to you?

CA: Just the layout of it, really. With the dining room in the middle towards the south, then you've got the east wing and the west wing. The east wing originally was purely for ladies, and now it's been changed a little bit.

KH: I can even remember that.

CA: The west wing, what is now the Wright room was originally a pool room, they had three regular pool tables and two billiard tables, and there was some old cronies that kept their place at the pool tables, so when we would walk up there from Delco at noon we would grab a quick sandwich in the dining room, and then go to that pool room and spend twenty minutes on the billiard tables. [Chuckles; chime goes off]

KH: When you were at Delco, going to the Engineers Club, did you use the Engineers Club library very much?

CA: Very, very much.

KH: Tell us about your experience with the Library.

CA: When Milt Feldstein, he was a master mechanic at Delco, came to me and told me that the man who had been doing all of their processing work on the resistance welding machines, like seam welders and press welders, he just suddenly up and moved to California without giving them any notice, so Milt Feldstein came out and said since I was the only electrical engineer in the department, I would now be their welding engineer as well. That's what started me in the welding business. You're familiar with a tubular-type shock absorber? There's a cap on each end of that and that is mash seam welded to the tube. As I mentioned, we built a lot of lines for Delco to turn out a thousand of those an hour... I forgot what I was going to say.

KH: We were talking about the library.

CA: Well, when Milt got me started following up on these resistance welders I spent quite a bit of time at the Engineers Club library looking through electric circuits so I could follow the wiring in the control panels for all of these resistance welders. I hadn't had any of that in school.

KH: Can you talk about the importance of the Engineers Club library or the usefulness of it to the engineering community?

CA: I was also on the library committee when this engineering book explosion took place and there were so many books coming out that we couldn't afford at the club and eventually, it's just a historical type of library right now. But back in those days there were very active engineering books there in the library that I used.

KH: It may have been the primary resource for engineers, maybe throughout Ohio.

CA: Yeah, it was at that time.

KH: You're right. When the information exploded there wouldn't have been space or funds for it.

CA: In fact I was also on the library committee at that time and I knew the head of the engineering department at the University of Dayton very well. They were also members of our church. So I asked him if they wanted some of those library books that we had to get rid of down there, we had whole sections that we had to get rid of, so he came down and took them, [truck hum] so they're at the University of Dayton library now.

MM: You mentioned working on or designing lines, was that assembly lines?

KH: You talked about lines to make a thousand shocks an hour. What do you mean by lines?

CA: It's a conveyor carrying fixtures to these different machines in sequence, from one end to the other, so you complete the whole body of the shock absorber, in one progression on this line.

KH: And there were people, like an assembly line?

CA: Yeah. Some of it was people, and some if it was automatic loading.

MM: You said that you designed some of these assembly lines?

CA: I helped on the designs.

MM: Were these automated welding machines anything like the robots you see in car factories?

CA: Yeah. Well, we built one. The piston and rod end of a shock absorber is also what you call a projection weld. You weld the piston to the end of the rod. We built a machine to turn out a thousand of those to match the other line, in just a rotating machine. The operator would shove in the rods, but the piston and the ring on the other end were automatically loaded, and this rotating machine again was turning out a thousand of those an hour.

KH: You mentioned a patent for the steel structures in roads. Do you have other patents or inventions?

CA: That's the only one I have [chuckles].

KH: That's one more than most people! I'm out of questions. I'm satisfied.

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MM: I did hear a story about you getting a plane ride.

CA: Oh, you mean the ride on the Wright B lookalike?

MM: Also the Deeds airplane? Or is that someone else I'm thinking of?

KH: Did you ride with Colonel Deeds on an airplane at some point?

CA: No. We took off from his west yard. When we were kids together, dad was working for Mr. Kettering at that time, and he arranged for the vice president of the Wright Airplane Company to take my twin sister and me up for a ride. Off of Deeds west yard, we were probably about twelve maybe, ten or twelve. The interesting thing about that is, they put Lois and me in that plane, and as we started rolling down the green of the grass, Lois got scared, opened the door and jumped out and ran back to my dad. So the pilot said close the door and we took off and flew around Delco Dell. Delco Dell was a summer spot for Delco Products people, it's kind of on a high knoll overlooking Moraine Country Club, and it's called Delco Dell. Mother and dad would spend time there in the evenings with their friends, dancing on the platform, and we kids would sit there and listen.

MM: I've heard a lot about the NCR employee park, was this like that?

CA: No, it was a different type of park. The NCR Park covers quite a bit of area, and in fact there's a big swimming pool on it even. This Delco Dell was just a few buildings in a wooded area on top of the hill.

KH: Well, thank you for this opportunity.

CA: Ok, you're quite welcome.

KH: And I think that you have an extraordinary amount of energy and wonderful memory, and it's really an honor to be able to do this.

CA: Well I thank you. I appreciate it.

MM: Thank you.