

**THE DEPARTMENT OF ENERGY ORAL HISTORY
PRESENTATION PROGRAM**

OAK RIDGE, TENNESSEE

AN INTERVIEW WITH HERMAN POSTMA

FOR THE

**OAK RIDGE NATIONAL LABORATORY
ORAL HISTORY PROJECT**

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STOW: [Today, we are here] with Herman Postma. Herman came to Oak Ridge National Laboratory in 1959, having been a summer student here prior to that, and emerged as director of the Laboratory from 1974 to 1988. He's got a lot of stories to tell, and a lot of things got started under his supervisory role as Laboratory director, and we'll be talking about those today. Herman, thank you for joining us today. We look forward to a discussion about your recollections while you were here at ORNL. Tell me -- how did a North Carolina fellow get interested in science to begin with? Was there a person or an event in your early childhood that got you started down this path?

POSTMA: Well, more or less. My father was a farmer, and he never finished the seventh grade, but he was very inventive.

STOW: Yes.

POSTMA: And if you live on a farm, you know you have to be inventive in order to get things done. They don't build things exactly like you want them to, and they don't work exactly as advertised. So, he was always changing and I was helping.

STOW: Yes.

POSTMA: I ended up getting an old car and rebuilding it. In high school, I had some wonderful teachers. Our high school, New Hanover High, was home for Michael Jordan many years later and a few others who have some fairly great nonathletic fame.

STOW: Yes.

POSTMA: I had some tremendous teachers. I had Algebra I and II in high school with a wonderful teacher. The teachers spurred me on. I built a Van de Graaff accelerator and a few things. We didn't have a contest. It was fun. I was always messing around, so to speak.

STOW: So, when you entered Duke University, did you know that you wanted to go into science and, more specifically, physics at that time?

POSTMA: Well, I thought briefly about being a medical doctor. Then, when I got there, I had won the North Carolina physics contest [and placed] second in math.

STOW: Okay.

POSTMA: Then, when I got to Duke, they said, "Well, you did real well." And, I skipped a lot of classes because of high school, and I said, "Well, this science stuff is a lot easier than being a doctor." So, I went and did physics.

STOW: (Laughs) Good! We're glad you went that route then.

POSTMA: (Laughs) I don't like blood very much.

STOW: We're better off for it. What brought you to ORNL? You were here as a summer student in the mid-50s, I believe. Was there a person or project that brought you to ORNL?

POSTMA: Well, no. Duke helped guide people, particularly their science students. And, I had two options, which were to go to IBM that summer or to come to a laboratory.

STOW: Yes.

POSTMA: IBM was in New York. That's pretty far away for a southern boy.

STOW: That's true.

POSTMA: So, I went across the hills. We'd spent a lot of time in the mountains. Our family had vacations and [did a lot of] driving around [there]. So, I decided to come to Oak Ridge. After all, it was the only national laboratory in the South.

STOW: Did you know the history of Oak Ridge National Lab at that point?

POSTMA: Oh, yes.

STOW: Its involvement with the bomb project, and so on?

POSTMA: Oh, yes.

STOW: Okay. What were your career objectives when you came here after getting your doctorate out of Harvard? This was in '59?

POSTMA: [It] was, in fact, in March of '59.

STOW: And, you came here permanently and have been on the staff ever since, although you took a one-year appointment in the Netherlands, I believe.

POSTMA: Yes, yes.

STOW: But as you came here as a young Ph.D., can you recall what your career objectives were? Did you expect to spend your career here at Oak Ridge National Lab?

POSTMA: Probably not. I had come here four years -- four summers as a summer student. And I'd worked for Louis Roberts and John Dabbs.

STOW: Okay.

POSTMA: And, Louis left and went to [the University of North] Carolina at Chapel Hill years ago, and he died a few years ago. John Dabbs is still in Oak Ridge and a marvelous guy. I see him -- oh, at least once a week anyhow. They loved science. And, they taught me to like, particularly, physics.

STOW: Okay.

POSTMA: You don't get that out of a dry book at Duke or anywhere else. You have to experience it. So, I knew that I wanted to make a career in science. And, when I was in graduate school at Harvard, they had very few courses in plasma physics, and I took them all.

STOW: All right.

POSTMA: Then I went to MIT and took whatever they had [in plasma physics] and in nuclear engineering. And, when I got through, I said, "Well, [I have learned a] combination of reactor

[technology] and plasma physics, so [a career in these areas] would be very interesting." And, having had a basis here at Oak Ridge, it just seemed quite natural for me to come here in '58...

STOW: Sure.

POSTMA: The exposure of fusion on a worldwide basis had just come out. So, it got to be an exciting field.

STOW: And, you joined the Thermonuclear Division, which later was changed to the Fusion Energy Division.

POSTMA: Yes. It went through a number of transitions in names, but...

STOW: What were the projects that you were working on when you joined the Thermonuclear Division at that early point?

POSTMA: Well, atomic physics, but [that] had little to do with fusion directly.

STOW: Okay.

POSTMA: It had to do with the measurements of cross sections of atomic species.

STOW: Yes.

POSTMA: And, there was some discrepancy between measurements that Clarence Barnett had done. I went to work for him. He was called "Barney" Barnett.

POSTMA: His son is a physician over in Knoxville. But, Barney and I collaborated on that. It turns out that I proved that his measurements were wrong, which is not a good way to proceed with the boss.

STOW: (Laughs) That's true.

POSTMA: But in that process, we bought an accelerator and tested it and then created scattering chambers. It was a tough thing to do, but we managed to bring that off.

STOW: Okay.

POSTMA: Then we proceeded to try to do something else, but it turns out that was also being done elsewhere at the Laboratory by Sheldon Datz. So, I dropped out of doing that myself. [If] Sheldon was doing it, there was no need for two people to do it. So, I went into plasma physics then.

STOW: Yes. At what point now, or what year was that that you got into plasma physics or fusion systems?

POSTMA: Probably '61 or so -- close to that.

STOW: Okay. Not long after you came here then.

POSTMA: Not long -- a couple of years, yes.

STOW: Okay. And you were involved with a project called the ORMAK?

POSTMA: Yes. It stood for Oak Ridge Tokamak. Tokamak is a Russian word for "large current."

STOW: Yes.

POSTMA: In '68 several of us went to a conference in Russia, and the Russians revealed that they had a large fusion machine they called a tokamak. This was sort of an idea of Lev Artsimovich, who was one of their leading scientists.

STOW: Yes.

POSTMA: I came back from the conference. I'm an opportunist. There are a number of things that have come up [for me] as a scientist and director of a laboratory. We were in fairly bad shape at the Lab in fusion. We had no large project. The ones we had -- I was in the process of proving that they wouldn't work . . .

STOW: Okay.

POSTMA: ... which is not a terribly good position to be in.

STOW: (Laughs) Not a wise move, necessarily.

POSTMA: But, that's the way it turned out. And so, I said, "We're going to build a tokamak." And, I got a couple really top-notch people, John Clarke and Mike Roberts, whom I had hired a few years before -- very bright young folks with a tremendous amount of energy. And we designed a whole new machine -- got it through the approval process of the Atomic Energy Commission. We beat Princeton to the punch because we decided to continue [the work] very fast. Princeton was saying that this won't work and that won't work, etcetera. So, we rushed in where the angels were scared to go...

STOW: (Laughs)

POSTMA: ... and beat 'em to the punch and actually got the machine. They came back, of course, to realize that that was a good thing to do and eventually got very large machines at Princeton [Plasma Physics Laboratory].

STOW: So, this was Soviet technology that you learned of?

POSTMA: Oh, yes.

STOW: Was there collaboration between the Soviets and the United States at that point? This was at the height of the Cold War.

POSTMA: Well, I'm not sure it was the height of it. It was pretty bad. At that time you felt very safe going to Russia because you knew you were being watched a lot.

STOW: Yes.

POSTMA: And, nobody was going to do anything to you. But, yes, in '58 at the Geneva conference, the collaboration of fusion scientists became open. There was a lot of exchange. In fact, I took Russian here from Joe Lewin at Oak Ridge High School, and I learned Russian with some fluency at that time.

STOW: Yes.

POSTMA: We had [Russian] delegations here and delegations from here went to Russia, all in the early and mid-'60s. So, this was probably a collaboration. It was really very open.

STOW: Okay.

POSTMA: And, there were [many] exchanges. Since fusion was and still is so difficult, those exchanges were absolutely necessary to make any advances at all.

STOW: Yes. I want to talk to you a little bit later on about the challenges that fusion energy is facing now, but let's go on about your career. You became division director in 1966 or 1967, as I recall. And then, pretty rapidly, by 1974, you became Laboratory director at the tender age of forty or thereabouts.

POSTMA: Yes.

STOW: What were your feelings on being named Laboratory director and following somebody like Alvin Weinberg at that point?

POSTMA: He's always a tough act to follow.

STOW: Sure.

POSTMA: I didn't know at the time all the circumstances surrounding that. But, there had been a very little known intermediate effect, as a matter of fact. Of course, I was Fusion Energy [Division] Director until I was named Laboratory Director. And, that prepares one for a lot of things. You learn the Washington scene. You learn [how to give] testimony to Congress. You learn an awful lot about the Laboratory here.

STOW: Sure.

POSTMA: [The Fusion Energy Division] was physically at Y-12. [We] had to count upon the Laboratory [at X-10] for a lot of things, so we got to be fairly well acquainted. And, it was a lot of heavy engineering, etcetera. So, there was a broad exposure to many, many things. And, that was fun! But, an intermediate stage [occurred when] Alvin Weinberg called me in one day -- this was in early '72 perhaps.

STOW: Okay.

POSTMA: He said, "I want you to be associate director for energy." And I said, "Well, that's interesting." So I had my picture taken. You know, before you make an announcement, you always get a picture taken.

STOW: (Laughs)

POSTMA: And, I remember it well, because I had a mustache. And, you could never see my mustache, but I had one.

STOW: Yes.

POSTMA: And, there are pictures on file somewhere in the Laboratory of me with a mustache. And, that was my appeal...

STOW: You ought to find those. (Laughs)

POSTMA: I think I've got one at home. But, this was a PR picture for the announcement.

STOW: Okay.

POSTMA: Well, it turns out, Alvin forgot to check with the AEC and with his boss, Roger Hibbs.

STOW: Yes.

POSTMA: Alvin didn't know they had other plans for him at the time.

STOW: Yes.

POSTMA: So they said, "No way are you going to name him associate laboratory director." So, I was the associate laboratory director in the minds of a few people for about one day.

STOW: (Laughs) The shortest one in history probably.

POSTMA: So, I did go through an intermediate step.

STOW: Yes.

POSTMA: It was not a jump from division director [to Lab director]. There was a one-day, intermediate, unknown stage a couple of years before.

STOW: But then, I think you took over on January 1st of 1974 ...

POSTMA: Right, right.

STOW: ... as Laboratory director, and those were some eventful years then, weren't they? We'd been through an Arab oil embargo and energy crisis that we were still suffering from. Tell us what some of your initial thoughts were. Here you are taking on a laboratory that has a long history of nuclear research. All of a sudden, the national interests are moving toward solar and fossil fuel and conservation, and so on. How did you stay in front of the power curve there and keep the Laboratory going?

POSTMA: Well, I had mentioned earlier that I had some opportunistic bent about things.

STOW: Yes.

POSTMA: And that showed up again. It showed up in the tokamak. I have to mention that when I took over the Fusion [Energy] Division that the Fusion [Energy] Division was going to be closed down essentially. It was on the list of DOE facilities [to be closed].

STOW: Is that right?

POSTMA: And, they had a review committee. I think my appointment bought a little time that we took advantage of.

STOW: Yes.

POSTMA: Now, I did not know that when I took it over.

STOW: Yes.

POSTMA: I found that out later, several years later. If I'd known it, I don't know what I would have done.

STOW: (Laughs)

POSTMA: And, the Laboratory, when I took it over, was in bad straits in a way, because Milt Shaw (AEC director of nuclear reactor research) and Alvin had big battles.

STOW: Yes.

POSTMA: And, Alvin and the Joint Atomic Energy Committee, etcetera, had big battles. The AEC and the Joint Committee still existed at the time. There were [many] transitions under way. And, the Laboratory was ... and, I didn't know this either ...

STOW: (Laughs) That kept you a little bit in the dark, hadn't it?

POSTMA: Yes. But I did know that [we had a] chance to diversify the Laboratory, which had already made steps [in that direction], which is why Alvin got into trouble a little bit. He diversified [the Lab] earlier with the [formation of an] environmental division, [addition of] energy work, etcetera.

STOW: Yes. He was a man of tremendous foresight.

POSTMA: I took that [new direction], and we started running with it because the opportunity was there, with the oil embargos and with energy becoming the word.

STOW: Yes.

POSTMA: There were twenty-nine committees in Congress dealing with energy at the time.

STOW: Is that right?

POSTMA: We had ERDA get formed ...

STOW: Yes.

POSTMA: ... and then disappear a few years later. So, there were a lot of changes taking place, and when there's change, there's opportunity. So, we just said, "We are going to diversify. We are going to have to diversify to be a strong laboratory."

STOW: Sure.

POSTMA: And, not only was there a diversification of energy [research], but it was looking at other agencies as well to see what kind of work we could do. And, we had to do that later ...

STOW: Yes.

POSTMA: ... because a laboratory really needs big, complicated, important devices, like SNS and HFIR and others, in order to rally around certain themes.

STOW: Right.

POSTMA: We wanted a big fusion device. But we had none of those [big devices] in the works. So, we took other steps to try to get...

STOW: What would you say your greatest challenge was as you came in as Laboratory director in '74 in this environment of the need for diversification and energy technologies and everything? Did you have staff that could handle the new challenges? Did the Laboratory have to go out and have a major recruiting effort? Did you get cooperation out of the AEC and ERDA? What were your greatest challenges?

POSTMA: Well, managing growth well -- that was a growing period. I think we hired almost a thousand people over a two-year span during that time.

STOW: Is that right?

POSTMA: So, that was a challenge. We had to, of course, go out and try to get the best people. We had to first decide what it was we wanted to do or not do.

STOW: Yes.

POSTMA: There were a lot of things being shoved at us by ERDA and, in some cases, we said no. Probably in most cases we said no to some crazy kinds of ideas, but there were things that we thought were important. And, what we thought was important was a new national energy policy at that time. It was called "coconuke," [which stands for] coal, conservation, and nuclear energy. They were the most important things.

STOW: Coconuke... ?

POSTMA: Coconuke was sort of the rallying cry. And, conservation at the time [had solar] wrapped into it. Solar, of course, means biomass ...

STOW: Yes ...

POSTMA: ... as well as wind, depending upon your definition. We did it broadly. So, coconukes were [what] we said we needed to go after. We went after coal. We had a lot of chemists who knew and understood things like that.

STOW: Yes.

POSTMA: We went after nuclear, of course. It was in the process of dying, and we didn't know that's where we were at the time. And certainly, we went after conservation. Now, there are things we didn't go after like thermal gradients in oceans and thermal energy in geothermal [wells] and others ...

STOW: Yes.

POSTMA: ... because it didn't make sense for us, or it didn't make sense for science.

STOW: Another thing happened in 1974 that I want your reflections on. The name of the Laboratory got changed, didn't it?

POSTMA: Yes.

STOW: What are your recollections on that? What were your thoughts at the time?

POSTMA: Of course, about a year or two before then, [the name of the] Jet Propulsion Laboratory got changed in honor of its local congressman.

STOW: Yes.

POSTMA: So, [changing names of federally funded facilities] got to be the thing to do. So, when the Joint Atomic Energy Committee got dissolved, the committee chairman, Chet Holifield, needed to be honored. So the political types decided to honor him by renaming the Oak Ridge National Laboratory. Most everybody here thought that [naming the Lab Holifield National Laboratory] was absolutely terrible -- because Chet Holifield did not like the Oak Ridge National Laboratory.

STOW: He didn't, huh?

POSTMA: He did not. And, there's a story about that. But, he did not like the Laboratory.

STOW: Yes.

POSTMA: So, to be named after somebody who didn't like you, or to be named after anybody at that time, didn't seem appropriate. So, we were very reluctant. I remember at the time that we would stall. We did not change the letterheads of internal Lab stationery. The letterheads [for stationery that was sent] outside the Laboratory I had printed up just for my office and nobody used them but me. Because we were officially the Holifield National Laboratory, I had to use the new letterhead.

STOW: Yes.

POSTMA: And then, there was a third set of stationery that had a letterhead with "Oak Ridge National Laboratory" in large letters and under it, in very small, one-point font, "Holifield National Laboratory."

STOW: (Laughs)

POSTMA: And, I still have some samples of that stationery.

STOW: Do you?

POSTMA: Yes. But, then we worked in the first year that Marilyn Lloyd was representing the area...

STOW: Yes.

POSTMA: ... and her task was to change that. She remembers it fondly. And, she was successful to get it changed back.

STOW: How long were we Holifield?

POSTMA: About one year.

STOW: One year?

POSTMA: Yes.

STOW: And, you had not been consulted about this ahead of time?

POSTMA: Oh no. (Laughs) Of course not.

STOW: (Laughs) Golly.

POSTMA: Why should they? It's not something they knew anybody would agree to.

STOW: Well, I understand. A number of other things happened while you were director of the Laboratory that had impacts. Three Mile Island happened. Chernobyl. How did these events impact the programs at the Laboratory, or did they?

POSTMA: Well, eventually, those two events meant the demise of nuclear reactor research.

STOW: Yes.

POSTMA: So, in the long term, it took several years. That was the outcome. In fact, our conservation programs got to be much larger than our nuclear reactor programs ...

STOW: Yes.

POSTMA: ... not too long after that. The immediate [impact in the] short term was that we, of course, deployed people -- reactor technologists, the robotics folks, the environmental folks that help physics people, to try to help in figuring out what happened and what the repercussions were. So, there was a lot of activity and responsiveness of the Laboratory, as it should be. But in the long term, it meant, of course, we were getting out of the [nuclear] business.

STOW: There were a number of things that got started under your tenure as Laboratory director. I want to get your thoughts on that. For instance, the seed money program got started, I believe, in 1974?

POSTMA: Yes.

STOW: And, what was your role in getting that seed money project or program under way? Because it still survives today, of course.

POSTMA: Oh, yes. It had always been a concern of ours that our weapons laboratory friends were able to spend a lot of money at their discretion.

STOW: Yes.

POSTMA: And, it was also true that in order to do anything outside of what was programmed, you had to really sequester a lot of money to take chances with.

STOW: Yes.

POSTMA: But, it was also true that Alvin got into trouble because he sequestered a lot of money in order to work on the Molten Salt Reactor, and that's what got Milt Shaw very unhappy...

STOW: Okay.

POSTMA: ... and, what got Alvin into trouble. So, I was caught between all these forces, see. So, I said, well, the only way to do it is to legitimize it. So, being unaware, I just went to Riche and said, "This is something we ought to do, and this is how we ought to do it." And, they bought it! I mean, it took maybe a year to persuade them.

STOW: Sure.

POSTMA: But, they said, "Well, it makes sense" -- for the reasons I just gave. And, of course, Congress ultimately says, every cent we give you for any program is supposed to be spent on that program.

STOW: Yes.

POSTMA: And, for you to scrape off any money for any other purpose is not desirable, because we didn't tell you to do that. So, DOE had to go back, of course, and check with Congress, and Congress said, "Yeah, that makes sense to within a certain range." So, that gave us the legitimacy. But, it was a battle we had to fight.

STOW: And, out of this came what we today know as the seed money program and the Laboratory Directed Research and Development, or LDRD, program, which is the backbone of our innovative research around here, as far as getting new initiatives under way.

POSTMA: Well, yes. And, after several years of having seed money in LDRD, we decided to study it and see what had been the impact of this [internal funding]. Our purpose was that we'd fund [innovative research], like a venture capitalist for a certain stage, and then, quote, "We'd go public." Well, in that case we'd go to the public fountain where we could get money. So one of the measures was that if we put in a certain amount of money, how much money did that bring in and in what kind of time span.

STOW: Yes.

POSTMA: And, we looked at that. And, it turns out that the seed money beat [other funding sources], resulted in a lot more patents, a lot more papers, and returned on the investment within a very few years. And, we'd say, "Well, this is good. We will write this up." So we wrote a paper -- an internal document at the time -- and decided we ought to publish this. It [pointed out the advantage of giving money quickly] to a scientist with an original idea, in three weeks instead of three years, as the old 189s required.

STOW: Yes.

POSTMA: [The paper stated] that if [researchers] got the money quickly, they would get enthusiastic about it, and they'd work hard. And, of course, they had a good idea to start with. Well, the outcome was what I mentioned.

STOW: Makes sense, doesn't it?

POSTMA: ... time, money, inventions, etcetera. We wrote this up, and Washington wanted to review it. Well, they didn't believe us. They said, "You can't publish that, because, look what would happen. If you publish that, it said we ought to give you all the money, because you can be a lot more innovative [using] it and get more results than if we dealt it through our system." And, I said, "Well, that is true, to a certain extent."

STOW: Yes.

POSTMA: So, they sent down a team to look at the results to see if we hadn't made them up. Well, it turns out that the results were true, and we eventually published the paper. Now, that becomes engrained. Seed money was given to people who had invented something or had a new idea and needed some money to get started. LDRD money was for research projects that management said were important to the Laboratory. We will fund [certain areas of research] over several years, and you need to come up with the best ideas in these areas. So, it was more constrained, and it was targeted research in a way. And, it cost more money, and it took a longer period of time than the seed money did [to get results that would bring in DOE funding].

STOW: Sure. But today, seed money programs and LDRD programs are common throughout the Department of Energy system.

POSTMA: Yes.

STOW: Are you saying that they actually got started back here?

POSTMA: Well, I think they actually got started at the weapons laboratories ...

STOW: Yes.

POSTMA: ... but they never quote, "legitimized in any other laboratory."

STOW: Okay.

POSTMA: So, we essentially started it and made it legitimate -- got it through all the hurdles that you have to go through in DOE and Congress.

STOW: That's an interesting perspective. I'd never known the origin of those programs before, so -- good. You've kind of touched on this, but during your tenure as director of the Laboratory, we began to get into tech transfer initiatives. And, I believe, you were fairly instrumental in initiating some of the tech transfer activities. Can you give us your thoughts as to what led you to the position of thinking that the Laboratory ought to be spreading out and getting into commercial activities and transferring technology out to the community, and so on?

POSTMA: Well, the policies of the Laboratory before my time went like this. It is both the Laboratory policy and the understanding within the agency that anything you invented belongs to the government, because you spend government money to do so. And, therefore, if it belongs to the government, it's open to anybody who wants to use it. Well, things that are open to everybody means that nobody's interested. Because, what do you do about your competition?

STOW: Yes.

POSTMA: So, we said, "That doesn't make sense." So, that was one factor. Then, the second thing was that I noticed we had a lot of foreign investigators at the Laboratory, which was fine.

STOW: Yes.

POSTMA: Except, they could take ideas back home and do things with them that we couldn't do here. That did not make sense. We were essentially doing R&D for foreign enterprises and not for our home-grown folks. And I said, that's also not very good. So, this [problem got attention from] the Laboratory directors [when they] met every once in a while.

STOW: Yes.

POSTMA: I remember a meeting early in my career in Chicago in the guest house where we were discussing this issue. I said, "Look, I'm [director of] the only laboratory that works for an industrial company." Union Carbide at the time.

STOW: Okay.

POSTMA: And, I was on a Carbide technical committee, so I would go up to New York and see what they did and how they did it. [So it had that other background. People in Carbide said, "Look, we will help you." So I said, "Look, I'll volunteer to pursue relationships with industry and someone else will volunteer to pursue relationships with the universities." So, we did that. We got interested in the IR 100 Awards [given to inventors of the top 100 innovations of the year by *Industrial Research* magazine].

STOW: Yes.

POSTMA: We started pursuing that vigorously, and we'd win about five a year. And, now our hallways are coated with them. And, we started overtaking General Electric as the leader in winning IR 100s. That was one way to get notices. We started speaking at the Industrial Research Forums. We started getting on committees [with members from] all the national labs, but we were the leaders in that.

STOW: Right.

POSTMA: And then we started working on Congress. At that time Al Trivelpiece [later director of ORNL] was head of Energy Research at DOE.

STOW: Yes.

POSTMA: And, we had [George Keyworth, the] presidential science advisor, who had worked at the Lab as a graduate student and also worked at Los Alamos [as director of its Physics Division]. And, both of them were amenable to technology transfer. And, we started getting in '80 the Stevenson-Wydler Act [Stevenson-Wydler Technology Innovation Act of 1980].

STOW: All right.

POSTMA: So, we had DOE and the Administration [on our side] -- and I'll take some credit for that. But, I won't take credit for what happened in Congress, because national forces were pushing in a direction of [transferring government lab technologies to industry]. And, we just happened to say, "All right, let's go with it." And then, maybe the biggest thing was when the bid came up for the Laboratory in '83 [when DOE announced that the contract to manage the Lab for DOE was up for bid].

STOW: Yes.

POSTMA: Well, one of the components of a winning contract bid was this famous Volume 4 within the city. The idea was that those companies that bring the ability to transfer technology and create industry in Oak Ridge ought to be given preference, other things being equal.

STOW: Right, yes.

POSTMA: And, Martin Marietta got that Volume 4 in as part of the bid.

STOW: Okay.

POSTMA: Martin Marietta, at the time, took that very seriously. So, they said, "Well, we're going to create a park." (Now known as Commerce Park) And, we're going to create some businesses, and we're going to put ten percent of our fee into creating these businesses. And, we're going to put somebody in that knows how to transfer technology -- and Bill Carpenter came.

STOW: All right. I remember Bill.

POSTMA: And Bill was a dynamo. He worked very hard. He was good. He was a pain at times to me personally. But, that's all right, you know. I said I'll put up with the ninety-nine ideas you have that aren't worth a hoot for the one idea you have that's really good. He had enough ideas to make a lot of them good. And, they paid off. And, we really got rolling. And, now, of course, DOE has sort of changed its mind. It's not encouraging technology transfer ... they have their reasons. I don't like their reasons, but, fortunately, we've got UT-Battelle on this last bid who did feel that it's important and are pushing it, in spite of DOE's reluctance.

STOW: So, let's tick off various things that got started under your administration. We've got the seed money program, LDRD, IR 100 awards, industrial interactions, tech transfer. What about the Distinguished Scientist program with UT?

POSTMA: Yes.

STOW: Tell us a little bit about that.

POSTMA: Well, Jack Reese, who was the chancellor at UT at the time, and I were good buddies -- or got to be good buddies.

STOW: Yes.

POSTMA: I forget exactly the originator of the idea, but we both latched onto it simultaneously. And, we said how nice it would be if UT and the Laboratory were strengthened with some mutual arrangement. So, we came up with joint appointments. Of course, that required a lot of negotiation again with the Department of Energy about how do you do that, who has what kinds of rights, and how are the patent rights shared?

STOW: Yes.

POSTMA: So, it went on and on. And, we had all kinds of frustrations. But anyhow, we decided to formalize a program, and Jack and I signed an agreement. Neither one of us was empowered legally to sign anything.

STOW: (Laughs)

POSTMA: Even though I was director of the Laboratory, all the legal matters had to go through my boss, because I was a conduit.

STOW: Yes, sure.

POSTMA: And, Jack was the chancellor, so all the legal things had to go through the president of the University of Tennessee system.

STOW: All right.

POSTMA: So, we decided to sign this thing. And, it took about seven or eight years before the lawyers finally got everything straightened out so it could be legitimized. And, you know, we weren't going to wait that long. What were they going to do? They weren't going to fire us.

STOW: (Laughs)

POSTMA: They could have killed the program, but that would have been stupid. They'd know that. So, we just went ahead and did it.

STOW: All right.

POSTMA: And, it worked fine. We selected a number of people and got the appointments done. And, of course, about that time Martin Marietta came in, and they wanted to get credit for it. But, of course, we'd already done it, but they got credit for it, too.

STOW: Well, that's fine.

POSTMA: Let's give everybody credit.

STOW: It's another program that survives to this day and thrives very well. And, speaking of that, there's another thing that survives in a different form today. SNS, which has its origins back in the days of the Advanced Neutron Source, got started under your tenure here at the Laboratory.

POSTMA: Yes.

STOW: Can you go back and reflect on how ANS got started?

POSTMA: Well, back in the early '80s, every Laboratory director realized that for a laboratory to do well, it has to have, as I mentioned earlier, certain rallying points or functions.

STOW: Sure.

POSTMA: One of those is to be a steward of a large user facility that can't be put at a university because it costs too much to build and run on an enduring basis.

STOW: Sure.

POSTMA: So, all laboratories are trying to [identify research facilities] that science needed and that they could [get funding for]. And, there's got to be a sort of agreement that is worked out. And, the laboratories were then coming up with lots of ideas, some of which conflicted with each other.

STOW: Yes.

POSTMA: Like Berkeley and Argonne wanted certain things in common. And Brookhaven was doing similar things, etcetera. So, it turns out, about that time, a site for DOE's proposed CEBAF accelerator was going to be selected. And, Argonne and the Newport News Consortium were in competition. DOE selected Newport News, Virginia, as the site, probably to some extent because Senator John Warner of Virginia was the head of an influential committee and he wanted it located in Newport News.

STOW: Yes.

POSTMA: Well, Argonne managers fought this decision tremendously. They went to their congressmen and tried to get it changed, saying that the accelerator legitimately belonged to Argonne and asking why Congress was creating a new facility, and on, and on, and on. And, CEBAF appointed Herman Grunder as its director, and Herman is a feisty ole boy. And it ended up that this got to be a battle that was embarrassing to the Department of Energy and to Al Trivelpiece, who was head of DOE's Office of Energy Research at that time.

STOW: Okay.

POSTMA: Trivelpiece said, "This shall not happen again." But, in the meantime, of course, a couple of years ago, Herman became director of Argonne National Laboratory, which is justice of some sort. And, the Laboratory director at the time who was leading Argonne's fight (Bob Sachs) eventually disappeared.

STOW: All right.

POSTMA: But, now we return to Al Trivelpiece. He called the Laboratory directors into his office in Washington one time and said, "Look, you guys, we're not going to have this happen again. I'm going to let Brookhaven have this, and I'm going to let Argonne have that. I'm going to let Berkeley have this. I'm going to let Oak Ridge have that."

STOW: Yes.

POSTMA: We were last in line because we had an upgraded reactor. It was going to be terribly expensive, and the design was not easy. So, Brookhaven got its Relativistic Heavy Ion Collider. Argonne got its Advanced Photon Source and Berkeley got another kind of light source. Everybody got things that they wanted that were legitimate. Peace reigned, more or less. There was ...

STOW: ... a little infighting.

POSTMA: Yes, but that's all right. That's always true. But, essentially [peace] reigned.

STOW: Yes.

POSTMA: Well, we had the ANS at the time and the need for a reactor, or [some other facility to study materials], was part of our long-range plan.

STOW: Yes.

POSTMA: We knew that materials research was terribly important to the long-term future of the Laboratory and the country. I generally give credit to Alex Zucker for having forced this issue on us, because at the time the HFIR [High Flux Isotope Reactor] was twenty years old. Postma's Rule -- that it takes ten years to get anything done -- meant HFIR would be thirty years old. Well, Postma's Rule was wrong. It's really twenty years, not ten years, [to get a research facility built].

STOW: Yes. (Laughs)

POSTMA: But, we started down the path. We sold [the ANS concept] to Al Trivelpiece and legitimized it. Alex Zucker and I went around to all kinds of committees and material science committees, the National Academy of Sciences, groups within DOE, etcetera. Everybody agreed that the physics, the science, needed that. But the cost kept going up.

STOW: Yes.

POSTMA: So, by that time, I had left the Laboratory and Al Trivelpiece came in as director. I hired Al and made this point: "You got to get the ANS here. You legitimized it. Now we've got the longest route and it's last on the list. You've got to get it here." Well, it turns out that he got a phone call that said, "You've got forty-five minutes to decide whether we dump [the ANS] or do something else." And, he decided wisely to do something else. And he brought home the bacon.

STOW: Yes.

POSTMA: I mean he did it!

STOW: He did it. And, it's emerged now as the Spallation Neutron Source, basically.

POSTMA: Yes.

STOW: You mentioned materials research. HTML [High Temperature Materials Laboratory] was built under your tenure, also.

POSTMA: Yes.

STOW: Any brief stories you want to give us on the history of HTML and the way it got funded and legitimized?

POSTMA: Well, we legitimized totally at the Laboratory "user facilities," which I view as sort of a landmark, too. "User facility" meant facilities where we make it possible for industry to use them for a fee and get patent rights [to the technologies that industry develops at the user facility], etcetera. But, we legitimized user facilities, and we also realized that if you're going to get something through, you're going to need broad support for it. You're going to need support from universities, industry, and government agencies, because that was the nature of life. So, the HTML was one user facility that we had said was important to have, so the planning for that started in '74 or '75. It was planned fairly early in the game, and it got on a fast route, because it was something that could be done by politicians. Also, we had a great friend in Bill Manly.

STOW: Yes.

POSTMA: Bill, who was with Cabot at the time, would go to Congress and say, "We (industry) need a facility like that."

STOW: All right.

POSTMA: Bill wasn't associated with the Laboratory at the time. After he retired he did come to ORNL, but he was very important in helping to sell [the HTML concept to Congress]. So, it became a real-life entity and the first new facility in a long time for the Lab.

STOW: It's still a crown jewel at our Laboratory today. It's amazing the number of things that got started while you were Laboratory director. We've ticked them off. Seed money, LDRD, tech transfer, ANS, HTML, industry interactions, IR-100 awards, Distinguished Scientist program. And, during that period ...

POSTMA: Well, I was director for fourteen years. You got to do something during that time.

STOW: Well, you did something! You grew the budgets from under a million bucks a year to \$500 million or so, I believe. So, that's a lot of accomplishments. As you look back, Herman, over your fourteen years as Laboratory director, what are you most proud of?

POSTMA: Well. You ticked off a lot of things I am very proud of. I think that just getting the Laboratory on a more solid footing -- in terms of its kinds of programs, in terms of facilities, in terms of our interactions -- was very important. Something else you didn't mention is computing, and that's another story.

STOW: That's right. Yes.

POSTMA: We had gotten out of one way or another a lot of things that we should have been in. We had tentative entries into things that the course of world events enabled us to get into, like energy research.

STOW: Yes.

POSTMA: Now, let me come back to computing.

STOW: Okay. Let's go back to it.

POSTMA: Oak Ridge was at the edge of a lot of computing. [We had one of the first Lab computers called ORACLE, for Oak Ridge Automatic Computer and Logical Engine]. Our money got founded with the ORACLE stuff.

STOW: Yes.

POSTMA: And, over a period of time – Alston Householder [head of the Mathematics Panel] was the driver. Over a period of time, it languished, because nobody at the Laboratory really pushed it very hard. I think that both Eugene Wigner and Alvin Weinberg were analytical types and didn't much, as we say, "cotton to that kind of computing." And so, we'd get our device, and we, of course, meshed in with the rest of Carbide, which complicated things, because nobody wanted to take ownership of a computer or fight for it.

STOW: All right.

POSTMA: So, [getting the Lab a new research computer] sort of fell between the cracks. And besides the other labs, the weapons laboratories were taking off like bandits and getting all the big computing machines and sucking all that resource, I'd say. We decided that that was a bad state of affairs, because computing is terribly important for science. What happened was that parallel computing processors came in. And we said, by God, this is our chance. And, this was another opportunistic thing. So, we took LDRD money, gave it to Ray Ward, and said, "All right, we need a program in parallel computing. Go buy computers. Set up things." They were using the PDP/As computer to simulate parallel computing, etcetera.

STOW: Yes.

POSTMA: And, all of a sudden, we became the leading laboratory within the DOE system in parallel computing -- ahead of all the weapons laboratories. And ahead of Argonne, which is the main competition in all that stuff.

STOW: Yes.

POSTMA: And, we started getting better and better machines. We started being able to hire people. Of course, weapons laboratories woke up and quickly got into it. And, with their kinds of resources, they outpaced us in a few years. But, we got established. We got to be known in the world of computing again.

STOW: And, then your successor, Al Trivelpiece ...

POSTMA: Al hired a couple of people ...

STOW: ... got on top of that and built it even greater.

POSTMA: Al [recognized the importance of] computing to national labs. And, he hired someone who was very well known in the computing world, and he made it happen [that ORNL got] bigger and better machines. Now, of course, we're in the position, partly due to state money and partly due to the opportunities that come in, to have the best computer in the entire country -- or world.

STOW: And, you know, if history repeats itself, we may have the best one for a day or two, and then someone else will be ahead of us.

POSTMA: Yes, that's right.

STOW: That's the way life is, though. Now, we are celebrating the 60th anniversary of ORNL. That's one of the reasons we're doing these oral history interviews. Somebody, forty years from now, is going to be in charge of celebrating the 100th anniversary of ORNL.

POSTMA: Maybe you and I will do that.

STOW: As they look back over 100 years of ORNL, the name of Herman Postma is going to crop up as a very effective manager and director of the Laboratory. How do you want to be remembered down the road, as a director of the Laboratory? What are the words that you would want to be described as?

POSTMA: Well, let's see -- an optimistic, entrepreneurial, science administrator.

STOW: That's good. Taking advantage of a situation, that's one of your strengths, isn't it? Opportunistic?

POSTMA: Yes, but in a couple of cases, I didn't know that I had to do that. I mean, in the case of the fusion division and in the case of the Laboratory, both were in worse shape than I had realized. Maybe I would have added strengths to each had I known the full facts behind it. Or, maybe I would have been scared away.

STOW: Well, if you could go back and do anything differently during your tenure as Laboratory director, and your previous tenure as a division director, what would you do differently now that you can look back and have the value of 20/20 hindsight?

POSTMA: I'm not sure I would have done much differently in terms of the programs or how the Laboratory ran. I probably would have worked harder to get stronger research people here when we had the chances to do so. We upgraded substantially, and Jim Barker was an important part of that. And, Dan Robbins helped an awful lot.

STOW: Yes.

POSTMA: So, we recruited very well. Some people would sneak through and bypass my system and screens. I was sorry they got in, but that's all right. We all make mistakes. I wouldn't have changed those things too much.

STOW: Okay.

POSTMA: My personal style of doing things was maybe not as soft as it should have been. That's what my wife tells me. I have softened a bit as I've gotten older.

STOW: That happens with all of us.

POSTMA: I find that if I'd done that earlier in life, life probably would have been a little more pleasant for me and other people. But, I tried to be open and more democratic about the way we reach decisions. And, I had a wonderful set of associate directors that made life easy. But, they jumped on me a little bit.

STOW: Well, they keep you honest.

POSTMA: Yes. They kept me honest.

STOW: Speaking of associate directors and other people you've worked with, has there been anybody in your career who has influenced you to a large degree -- scientifically or administratively -- anybody that comes to mind as having been a real influence on you?

POSTMA: Well, of course, everybody you meet and spend any time with is going to alter things one way or another.

STOW: Sure.

POSTMA: You're going to learn from them, on a continuing basis. I had a boss, who was Roger Hibbs, who appointed me.

STOW: Yes.

POSTMA: The wonderful thing about Roger -- other than his brilliant insight into good people to appoint to things -- was the fact that he'd leave you alone. He'd make you report back to him on certain things, but his words were, "I want you to be doing something every year that would give me the grounds to fire you." He wanted me to go beyond the comfortable.

STOW: Pushing the envelope, as they say.

POSTMA: Yes. And, I think I found some of those things with him, but that was a big influence.

STOW: Yes.

POSTMA: I think people like Alex Zucker and Murray Rosenthal and Truman Anderson and Stan Auerbach -- all of these folks, for one reason or another -- were a very positive influence on me at the time.

STOW: All wonderful people.

POSTMA: Yes. And, I mentioned my early career here was greatly influenced by John Dabbs and Louis Roberts, who taught me science can be fun.

STOW: Yes.

POSTMA: And, Clarence Barnett, who I went to work for initially, taught me that hard work is very important, and if you're wrong, admit it.

STOW: Good lessons in any world.

POSTMA: (Laughs) Yes, yes.

STOW: What are you doing nowadays? When you left the directorship here in 1988, you took on a vice president role for Martin Marietta. That was many years ago, though. What are you up to nowadays?

POSTMA: Well, I've been retired now for twelve years. That seems almost impossible. That's almost as long as I was director.

STOW: That's true.

POSTMA: And, retirement has been varied. I was on the board of trustees at Duke University, and that took some time.

STOW: Yes.

POSTMA: I've been on the boards of small companies, trying to help them get started. Most of them have failed, but some of them have been a little bit successful. Last year, I had a wonderful undertaking. I was an arbitrator in a construction dispute. One of three arbitrators spent – well, it took over two years from start to finish -- three intense months of trying to resolve a \$50 million dispute between one company [that] accused the other of not doing things right, and the other accused ...

STOW: Did you use your physics background in ...

POSTMA: Well, actually, this was a radiochemical processing facility ...

STOW: All right.

POSTMA: ... and so, I had to use things I'd learned, like ALARA ...

STOW: Yes.

POSTMA: ... conduct of operations, change orders ...

STOW: Yes.

POSTMA: ... a little mechanical design here and there. And, that was interesting because I'd never been a legitimized judge. And, this time I was a judge of a sort, with no appeal rights – so, that's always wonderful...

STOW: (Laughs)... a bit of immunity there, right?

POSTMA: My wife retired three weeks ago, and she went to work about three months after I retired. She went to work full time.

STOW: Now, she's got a doctorate in economics, right?

POSTMA: Yes. But, can you imagine why she wanted to get out of the house?

STOW: (Laughs) You didn't take that personally, did you?

POSTMA: No. Yes, but now I want to get out of the house since she's come back.

STOW: (Laughs) Well, you'll have all this on tape so you can show it to her, and she'll know what your real faults are.

POSTMA: There's nothing I can say that she hasn't heard, at least two dozen times.

STOW: Okay. Fair enough. Is there anything that we have not touched on today that you want to talk about?

POSTMA: There's one thing I remember that was fairly influential. It was back when Truman Anderson was the head of planning at our laboratory ...

STOW: That's right, I remember Truman.

POSTMA: And, he was involved in many, many of these things. But, we decided that -- this was back in the mid-'70s -- that we ought to write down what were the important energy problems of this country — sort of give us direction, etcetera.

STOW: Yes.

POSTMA: Well, this evolved into a book. This book was then available. We had it as a thick internal report initially.

STOW: Yes.

POSTMA: Then, we decided to publish this. We found a publisher -- not a vanity publisher. We found somebody legitimate and proceeded to publish this thing. Well, at the time, Bob Hart was the manager of the Department of Energy's Oak Ridge Operations.

STOW: I see.

POSTMA: He didn't like it because that went counter to Ronald Reagan's early policies about energy.

STOW: Okay.

POSTMA: Because, we were still pushing "coconukes"...

STOW: Yes.

POSTMA: ... coal, conservation, and nuclear, but with a lot of other things, trying to point out the relative benefits and the problems, etcetera.

STOW: We've got one minute left here ...

POSTMA: Well, he didn't want us to publish it, but we did. He said, "You can't publish it or you'll have to pay for it out of fees." About three years later, the Secretary of Energy ran across this book and said, "This is wonderful!"

STOW: Wonderful stuff.

POSTMA: And, it became required reading within the Department of Energy.

STOW: (Laughs)

POSTMA: I thought that was a wonderful footnote.

STOW: And, did you ever speak to Hart about that?

POSTMA: Well, he knew it.

STOW: He knew it. Great! We appreciate it. It's been a good hour. Thank you, Herman.

----- END OF INTERVIEW -----