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Jeffrey Wadsworth

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ORAL HISTORIES

Interviewed by: David Zierler

Interview date: June 3, 2020

Location: Teleconference

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▼ ABSTRACT

In this interview Jeffrey Wadsworth, retired and former President and CEO of Battelle Memorial Institute, discusses his life and career. He recounts: early childhood around the globe due to his father's service in the British military, later childhood in Manchester, England, and final school-age years in Bahrain; undergraduate at University of Sheffield where he focused on metallurgy; decision to stay at Sheffield for graduate work measuring lattice parameters and testing steel strength at high temperatures; opportunities that led to his postdoctoral research at Stanford and metallurgy research at Lockheed; Livermore recruiting him to work on technology transfer issues during the Clinton administration; work as Associate Director at Livermore for chemistry and materials science and the internal politics leading to Michael Anastasio being named Lab Director; Batelle's attempts to recruit him to run the Pacific Northwest Lab, and their offer for him to run Batelle Labs as a contractor to the newly-created Department of Homeland Security (DHS); complex administrative framework that developed between DHS and the Department of Energy (DOE), and the dynamics that led to his directorship of Oak Ridge; his initiative to make Oak Ridge a center of supercomputing research; return to Battelle to run the entire organization; origins of the Spallation Neutron Source; complexities of having oversight of eight major laboratory sites; decision leading to him being named President and CEO of Battelle; move away from science to become more involved in philanthropy, and his achievements in this role during the financial crisis; importance of the transportability of his leadership skills over the course of his career.

Transcript

Zierler:

OK. This is David Zierler, oral historian for the American Institute of Physics. It is June 3rd, 2020. It's my great pleasure to be here with Jeffrey Wadsworth. Jeff, thanks so much for being with me today.

Wadsworth:

Well, thank you very much.

Zierler:

All right, so to start, please tell me your most recent title and institutional affiliation.

Wadsworth:

Yeah, most recently, I was President and CEO of Battelle. Sometimes the full name is used, Battelle Memorial Institute. And I was in that role for nine years and retired a couple of years ago. And that was my most recent major…

Zierler:

Are you doing consulting work now?

Wadsworth:

I'm on two publicly traded boards: Carpenter Technologies that do solution — we talk about being a solution company nowadays. They're well-known for their alloy steels and other products, high-end alloys. And also 3-D Systems, which is a company — they basically were the company that invented 3-D printing.

Zierler:

Oh, wow.

Wadsworth:

Chuck Hull is the inventor, and he's still on the board, so I've got to know him. They both trade on the New York Stock Exchange, and so they're the two technical affiliations I have. And I was recently invited to join a group called Novim, N-O-V-I-M, which takes on interesting tasks. That's not compensated. That's a voluntary —

Zierler:

[laugh]

Wadsworth:

The first two are — you know — real boards?

Zierler:

All right, Jeff, so let's go right back to the beginning. Tell me a little bit about your family background and your early childhood in England.

Wadsworth:

Yes, so my father was an army tank commander in World War II. He was from Bradford, England. My mother was from Bradford. They got married. I was born in Germany because he was — they use the phrase "posted" in English army. You're posted to places, like a letter. He was posted to Germany, and I was born in Hamburg.

And when I was about 1 year old — we moved the first of quite a number of moves — to Hoek van Holland in Holland where the troops were being deployed and returned in 1951, '52. I guess it was. And we were there for four years. And we went back to England in 1956 for six months, and then left in May of '57 to go to India, where he'd been posted, and we went by boat at that time.

Zierler:

He was still in the military at that point?

Wadsworth:

Yes, he was in the military till he died at age 49 in 1966. And we went by boat. It was *HMS Circassia* was the name of the boat, and I had my seventh birthday on the boat. I remember it quite clearly because they made a cake for me; which surprised me. [laugh] And they had a swimming pool on the boat. And we had to go around the Cape of Good Hope because the Suez Canal Crisis was underway in 1957. So, we went the long way around, came up, landed in Bombay, now called Mumbai, and went across India by train, which took a couple of days, and ended up in Kolkata. And we lived there for two years. And I went to school at Miss Bath's Private School along with other army kids and British kids.

And two years in Kolkata was considered quite a stretch. It was very hot, very poor, but very safe. I used to wander around on my own at age 7 on rickshaws and stuff, no fear. Lots of beggars. Interesting things would happen. And a guy stopped me one day in the street and

asked if I wanted to watch a mongoose take on a cobra. And within what seemed like 30 seconds, there were hundreds of people gathered around, hoping that this white kid would pay. He had one mongoose and several cobra which [laugh] —

Zierler:

[laugh]

Wadsworth:

— is a clue to the odds. [laugh] So after two years, we then went again by boat to Singapore. And in Singapore, we spent a year, and then we flew back —

Zierler:

Also at a British school? You were at a British school in Singapore?

Wadsworth:

Yes, the Alexandria School, yeah, and I was 9 through 10 kind of thing. And we returned to England to a place called Harwich and Dovercourt on the south coast. And that's where I went to the last school before you go to, well — you'd call junior high — well, at age 11.

You know, in England, there's a critical exam you take called the eleven-plus. It's a dangerous exam because if you fail it, you're on a path to schools that don't usually lead to college or higher education. And with the disjointed background I'd had, you know, there was always a concern about that kind of exam. But I did pass it.

But, you know, I had a very varied — as we'll discuss — a very up and down academic career until I was early 20s, when I took off really, and we can talk about that. But I would be hot and cold. And I think a lot of it had to do with the teacher quality actually, you know, because if I had really good teachers, I seemed to do well.

But moving around as much as you do as a kid is just disruptive. But I do remember we were in a class of about 25. And one day, the top four kids were taken to see a submarine as the reward of some sort. And kid number four got sick and couldn't make it, and I was next in line. [laugh]

Zierler:

[laugh]

Wadsworth:

So, there was some signs of hope, I guess. And then we were sent to Manchester, England. So, we moved from Harwich to Manchester in 1961.

Zierler:

This was also a posting for your father?

Wadsworth:

Yes. Yes, and he was there for two years. And we went to something that no longer exists, Chorlton Grammar School, where you start at age 11, and progress. And that was a different world again. It was — as you know, Manchester's the hub of soccer — football, we call it — and Manchester United/Manchester City rivalries were played out every day in the playground. It could be a tough place. Fights there often involved bicycle chains and…

Zierler:

Jeff, given your international experiences up till that point, what allegiance to any part of England did you feel at that point?

Wadsworth:

[laugh] That's a good, funny question, and I'll tell you why. You know, so I'm sitting in Manchester, which is in Lancashire, which is the Red Rose. And Yorkshire, where my heritage is, is the White Rose. And one day, my dad took me to see a Lancashire/Yorkshire cricket match at the Old Trafford that was the cricket ground, not the soccer ground. And we're sitting there, and I suddenly realized we're on opposite sides of the [laugh] — who's going to win. You know, he was devoutly Yorkshire, and I was sort of assuming Lancashire, and I suddenly realized we're —

Zierler:

[laugh]

Wadsworth:

— we have that difference. But nowadays, I feel most allegiance to Yorkshire. It's where my whole family came from, and my mother lived after we returned.

Zierler:

And did you stay there long enough for high school?

Wadsworth:

I did two years of school there, and then he was posted to Bahrain in the Persian Gulf. And Bahrain had no school at that time, so we then were — we were then — they decided we'd go to boarding school. And we went through school in the Lake District called Heversham near Kendal. And that was the worst three years of my life. It was a Dickensian kind of —

Zierler:

[laugh]

Wadsworth:

— school. And that — so I was there for three years, so that took me from age 13 to 16. And at age 16, you do so-called Ordinary Level exams, O-levels. Typically, in a good school, you'll do eight — seven or eight exams. And, as you know, these are proctored heavily. They're marked by external teachers. Your school has nothing to do with the evaluation of those exams. And, as I say, I was pretty mediocre. I think we had a class of 35, and I was typically 31st, because they'd rank you. They didn't have any of the political sensitivities today about participation and stuff. It was —

Zierler:

Right. [laugh]

Wadsworth:

— you're 31st out of 35. Get better, you know, kind of thing. So, I wasn't expected to do very well. And then I got sick, quite badly sick during the course of these exams, which take place over a couple of weeks. So, you have all of these years of school, and then everything's compressed into a two-week period. And you take these eight exams, some of which have two papers or, you know, it's quite complicated. But everyone does it. And those results came out maybe eight weeks after the school term ended. And unfortunately, they came out one week after my dad died. So, at that point, we're at boarding school. He was in Bahrain, but then he was sent to Aden in the Aden Protectorate. And so then we used to fly out once or twice a year to stay with my mother and father in Aden.

So, I got to see a lot of the Middle East, and there's some exciting things there. Bombs going off all the time. Mortars being fired down into the residential areas. We lived on a place called Maala Straight. But it was exciting, I mean. You know, I think I wrote about a soccer game that the benches all blew up as we were about to kick off.

Zierler:

What rank did your father achieve by the end of his career?

Wadsworth:

He was a Captain. After the war, he left the army, as many people did, and there was no work on civvy street, civilian work. So, he rejoined the army, and you lost a rank if you did that. So, he was a Captain.

After 2 years in Aden, he was posted to Berlin and he became ill. He was starting to be ill, but we didn't really know it. So now I'm still at boarding school. These O-level exams are coming up. He and my mother are in Berlin. We'd go out to Berlin several times a year because it's a lot cheaper than going to Aden. So, we'd go out most holidays, which meant three times a year.

We first went to Berlin as a family, by car in 1965, and went across communist East Germany where they stop you every 20 minutes and give you instructions to the next guard post and stuff like that. But Berlin was fabulous, West Berlin. So that was very exciting. And then we'd go back to boarding school and then go out again to Berlin.

So, I take these final O-level exams, and he's really ill at this point. The army send him back from Berlin to York where there was an army base called Strensall. So, he and my mother and brother are in York, and I'm at school finishing up these O-levels. And then I went home, and he died a few weeks later in August of 1966. And a week after he died, these O-level results came through. And he knew I'd been sick, he knew I wasn't doing very well, but actually I got seven out of eight [laugh] which surprised everyone and was a pretty good result. So now I'm in York, and I decided I did not want to go back to boarding school.

And so I went and found a school in York, Archbishop Holgate's Gammar School and people were very kind. And I met the headmaster of this school, and he said, "Great. Show up when school starts in two weeks." Now at age 16, when you go from O-levels from A-levels, you have to be either on the science side or the arts side. You get to study three topics in great detail.

And the one exam I failed was in French, so I wasn't about to be doing anything with languages. And so chemistry, physics and mathematics were the traditional three you took. But you could sub one of those out and do biology if you had aspirations towards being a doctor or a vet or something. But those are the three topics, and I studied those for two years. And at the end of the two years, you took these A-level exams. And the A-levels were pretty tough, I mean, they were tough. There would be practical exams in physics and chemistry, as well as written exams. And the exams would typically be three hours. So, you'd have a three-hour written exam, another three-hour written exam, and a practical exam where you did titrations or physics things. And I was really struggling at this point. I was not doing well. So,

as you know, my mother was widowed. My brother was out of control. I'm trying to keep things together, going to school. So, when A-levels came — they also had something called a General Paper A-level. So, I took four A-levels.

What happened in England at that time was you would choose a topic that you wanted to study if you had aspirations to go to university, and then you would find up to six schools. You could list six that you thought you might want to go to. And they would look at your application — they would decide whether they were interested in you or not — this is before the results for the A-levels — and they would invite you to interview. Or they'd be so hard up for people, they'd just say, "If you pass two of these, you can come." The offers were just all over the place. Very good schools of course said, "You've got to get these three A-levels and get the best grade." So, the grades went from A to E, and then you could have a failing grade that said it's worth trying again, or a failing grade that said it's probably not worth it —

Zierler:

Right. [laugh]

Wadsworth:

— because you're so far off. So, it's A through E, and then two others. But that's the way the system worked. And I did not have a clue what to do — didn't have a clue. Just keeping going. And the chemistry teacher kept bugging me, and he said, "You're not good enough to do physics or math or chemistry. But you might be OK with metallurgy or pharmacology." These subjects were easier to get into at a University as well. So, he kept bugging me, and asked me if I'd done anything about it. I hadn't, so he gave me a book called *Metals in the Service of Man*. And basically, it's a terrible story. I wouldn't ever advocate it. But to get him off my back, I applied for metallurgy. And I chose schools that were not too close, but they were not too far away, or they were of interest for some reason.

One of them was Sheffield, and partly because when I was at boarding school, I had a friend, and I would go to Sheffield with him on occasional two-day holidays. So, I knew the city a little bit, and I liked it well enough. So, I applied to Sheffield, as well as other places. And Sheffield at that time had an experiment going. They recognized that some kids weren't quite ready, and maybe another year would help them. So, they offered me an option: If you get three B's or three Cs, you can come and do a three-year degree. But if you get two Es and a D, we'll take you on a four-year degree." And my results were two B's and two E's but one of the B's was in the General Paper that didn't count. So, I scraped into this four-year degree at Sheffield. And it was a very good thing I did because if it had been a three-year degree, I wouldn't have made it. I just wouldn't have made it.

Zierler:

How come?

Wadsworth:

That first year was really helpful. It covered material in a different way, and I wasn't very good, but I got through. And then I was into the normal three-year degree. So, you joined a class of people coming in to do the three-year degree. Second year, I was mediocre. Third year, something was happening in my brain.

But there was a particular professor, Gordon Richardson. He was going over a part of the theory in metallurgy, something called the Larson-Miller parameter, and it was a one-on-one tutorial. And he was a really nice guy, and he said, "Do you know what this is about? Do you understand this?" And I said, "No." And he said, "Let's go over it." And he went through it, and then he said, "How's that? Do you understand it now?" You know, he was such a thoughtful guy, I was able to say, "No, I don't." And he said, "Well, we're going to do it again then." And he did it again, and then he said, "Do you understand it?" And I said, "Gordon, I'm just not seeing why we're doing it. I just don't understand it." "So, OK, we'll do it again." And halfway through the third time, I suddenly realized why we were doing it, and it was like [clicks fingers] a moment that changed in my life. And I left the meeting and I said, "You don't have to go further. I understand it." And I left, and I think what happened was I went from believing I had to memorize everything to believing I could understand it.

Zierler:

Wow.

Wadsworth:

I was talking to the head of the medical school at OSU once, Ohio State University a few years ago, and he sort of stopped me in this story, and went to the shelf and pulled off a book called *The Developing Brain*. And he said, "You're not alone." He said, "Ten percent of people have a moment where they switch on." And that's why I never give up on kids because you just don't know when they might switch on.

Zierler:

So is it your feeling, Jeff, that even if you had this amazing moment at 11, it wouldn't have worked? That your mind needed to be at that point, at that point in time for this to have happened?

Wadsworth:

You know, I don't know. I was 20 years old at the time, maybe 21, and I don't know. I mean, you leave home, your father's died. You've been at school. You haven't been very successful. You start to meet girls. There's all sorts of stuff going on. You're not very focused. And I just don't know. As I look back, it's a miracle. But I left that meeting, and now I wanted to be number one. I wanted to win prizes and I just wanted to be as good as I could be. And I went from being sort of mediocre to being pretty good.

Zierler:

What did this mean for your degree in metallurgy?

Wadsworth:

Well, I missed getting the top possible degree by a very small amount, which had to do with the politics of how many they gave away, and this, that and the other. But basically, I got a very good degree, and I was put immediately into a Ph.D. program. Incidentally, I had what was — for me — a completely free education.

If you got into university in those days, your county, in my case in Yorkshire, paid for your undergraduate degree. Now I also worked 12-hour shifts at steel mills and food processing plants during the holidays to make money. But basically, you had a stipend that would pay for a hall of residence kind of existence, and some amount of money for books and an occasional beer or whatever. And then you'd supplement it by working, as most students did at that time.

At this stage in England, the number of young people who went to university was about 10%. In the States, it's like 50%. So, it was quite a different system, and you effectively were paid to go. And then when I got into a Ph.D. program, I was awarded something called a Science Research Council grant for three years to pay for the three-year expected time it took for a Ph.D. at Sheffield in that subject. And I went straight into a Ph.D., finished in three years, and won the prizes that were offered for the best thesis. So, I was feeling very confident, and really enjoying research.

Zierler:

What was your thesis on, Jeff?

Wadsworth:

[laugh] It was on a fairly complicated thing that happens with He high-temperature creep of stainless steels. When you add niobium and carbon to strengthen the steel, you get strange effects as you move away from adding the same number of niobium atoms and carbon atoms, the 50-called stoichiometric ratio. So, I was doing things like measuring lattice parameters,

very exotic density measurements, testing these steels at high temperature. And in doing so, I was reading the best literature in the world I could find on the creep of metals, which is a high-temperature, slow-deformation of metals. It applies to turbine engines and nuclear reactors and anything that's operating at high-temperature. You have to understand the creep properties. And one of the literature sources I was reading was from Stanford University, who were putting out some superb work in creep. One of the professors there was called Oleg Sherby. And Oleg Sherby was — he was of a white Russian descent. His father had escaped communist Russia to China. So, Oleg was born in Shanghai, but he was of Russian heritage. He came to the States when he was 10, so he was fully American by the time I met him. But he was very — he was quite famous.

Zierler:

What department was he in?

Wadsworth:

He was in metallurgy, which is now called materials science. But it turned out that he did a Ph.D. at Berkeley. And after his Ph.D., he won a two-year Office of Naval Research Award to go study in Europe for two years. Specifically, to spend one year at the Office of Naval Research in London, and then he could choose where to go for another year. And he chose to go to Sheffield. So, this was in 1957, '58. And he was well-known at the time because in his Ph.D. world, the Ph.D. was done in your evenings and weekends. During the day, you were a research associate doing something other than your Ph.D. work. So, it typically took five, six years. But he was publishing all the time. So, he was known at Sheffield for his work on creep. And they invited him to come for the year, which he did, and he wrote a paper in that time, which was published in a very good journal called *Acta Metallurgica*.

But Sheffield asked him, they said, "Look, you're already well-known. Somewhere in the future, we'd like to give you an Honorary Doctorate. It's actually an earned doctorate for published work. But in order to get that, you need to be a graduate of Sheffield. So, would you mind putting your one-year *Acta Met* paper in as a master's thesis? And that way we can give you a degree, and that way, 10 years from now, we can do this big-time honor." So he said, "Sure." So, he got a master's degree, which is very thin [laugh] because it was, you know, a final manuscript. And when he went back to Berkeley, his advisor, John Dorn, who Oleg called the late great John Dorn, was absolutely furious with him. He said, "What are you doing following a Ph.D. at Berkeley with a master's at Sheffield?"

So when it came time to think about what to do after my Ph.D., Professor Greenwood at Sheffield suggested I write to Oleg because he knew the university. And it turned out Oleg had enough money to have me as a one-year postdoc. So I borrowed the one-way airfare, and what I thought would be enough rent for three months in Palo Alto, California, and I took a loan from Lloyd's Bank — I had no money — and flew with a briefcase and a small suitcase,

and landed in Stanford and — well, I landed in San Francisco. Oleg met me, and it turned out that was the start of a 30-year friendship and collaboration. We published over 100 papers together eventually. And so Stanford was my starting point in the US. And it was a very, very lively place — very competitive. We went to all the big conferences. Oleg was always wanting us to present, to publish, to, you know, be on stage to mix with the cutting edge.

That was a big difference I saw in the States. At places like Livermore, and places like Stanford, you were expected to be world-leading. Being number two wasn't interesting. It put you under a lot of pressure, but it also was a great motivator to get stuff really understood and done. So, I worked with him —

Zierler:

Jeff, I'm curious, at what point did you start to think of yourself as — you know, the United States was going to be where you were going to build a life and a career for yourself?

Wadsworth:

After one week.

Zierler:

Really? [laugh]

Wadsworth:

Yeah.

Zierler:

That's it? That's all it took?

Wadsworth:

I had no desire to go back to England to work. And I've said this on many speeches and occasions. This is the greatest country on Earth. This is the greatest country on Earth. And I don't believe I could've had my success running a $6 billion operation had I been — you know, if I was in Iran, I wouldn't, or France or Belgium. Maybe Australia, I don't know. But there's not many countries where you can go as an immigrant, brand new at age 26, and ultimately end up with that kind of responsibility. In the States, it's a meritocracy, I believe, mostly. In England, it wasn't. It very much depended on the schools you'd gone to, and there's still a lot of that kind of stuff going on — still is if you look at [laugh] parliament, you know, all Old Etonians and stuff like that, Cambridge, Oxford.

I thought America was the greatest country I'd ever contemplated. In fact, I had to fight very hard for Visas. And jumping ahead, you know, I joined Lockheed. And by that time, I had a green card and I held security clearances. And one day, some security people at Lockheed came to see me and said, "You know, we really have to have citizens to hold these clearances. But since you've got the clearance with your green card, and you're not eligible to be a citizen yet." Because you had to hold the green card for five years before you could be a citizen. And I remember saying to them, "Hey, bring it on. If [laugh] you can speed this up, I'm ready, you know." But I had to wait five years.

Zierler:

So how long were you at Stanford for?

Wadsworth:

Four years. I was there almost exactly four years. And when I was at Stanford, as part of our research, Oleg and I would go to Lockheed. They had a research lab in the Stanford Industrial Park — Stanford had taken a bunch of their land and created an industrial complex. Xerox was there — other big-name companies — and Lockheed had their research and development division there.

Just down the road, seven miles away was the parent Lockheed Missiles and Space Company, which was massive. It employed 30,000 people. The R&D facility employed about 1,200 at that time and was right next to Stanford — a beautiful place. And Oleg and I used to go over to Lockheed to do mechanical deformation of metals. They had rolling mills and furnaces, and they allowed us to use those.

And so we were able to do a lot of our research, the heat and beat, we called it, heating and beating of metals. So, we did it mostly at Lockheed, so I got to know the Lockheed people. After four years at Stanford, I was now married, and I had a kid on the way, and it was time to grow up and go get a real job. And Lockheed was one of two places that offered me a position, and I took it, so I started there.

Zierler:

What was the title of your initial position?

Wadsworth:

Research Associate, I think, something like that. And I just loved working there for the first few years. I was working on something called the Post Boost Control System (PBCS) of the Trident missile. This was the working piece of the [laugh] nuclear missile that goes into space. So the PBCS goes up on a Trident missile, and it goes into space. And it deploys and positions

using hot gasses at a very high temperature of 1650°C, which is above the melting point of steel. And it lasts for 12 minutes. And it is molybdenum alloys, tantalum alloys, niobium alloys, tungsten alloys, every exotic material you can imagine that operates at a very high temperature. And it was absolutely fascinating. And we were continuously having to solve problems, and invent better ways of manufacturing this stuff, testing it. And that was like half of what I did. And then the other half, I was doing research using discretionary research funds which were competitive, but I usually did a pretty good job of getting money.

Zierler:

So, there was a basic science research culture at Lockheed?

Wadsworth:

It was very mixed. There were a lot of people who were focused on just getting stuff out the door, and they weren't interested in publishing at all. Then there was a bunch of us who were able to do both real work for products but also carry out research and publish it. Some of that research could be quite basic, and interesting things would happen.

I was working with the Missiles and Space Company, solving a lot of the — well, trying to help solve problems, and they had more money than we did. And one day, a guy calls me, who I knew, and he said, "Hey, Jeff," he said, "we've got a program here on welding of molybdenum, it's about 400,000 bucks. Do you think you can spend it?" And I said, "Oh, yes, no problem." [laugh] You know, they'd got the money. They didn't quite know what to do with it. So, I had this money for a couple of years to study how molybdenum — it's difficult to weld, by the way — behaves. I was doing very basic research, so-called In-situ Auger spectroscopy. I had the freedom to play. And that work that I did at that time came back to pay Lockheed handsomely several years later when molybdenum parts were fracturing and almost grounded the U.S. fleet of missiles because following refurbishment they couldn't put them back together without breaking parts. And I understood how to fix it, and as a result of that basic work that had been done several years earlier.

So, things like that happened. It was a fascinating place. Then my boss didn't get on with the guy above him who happened to be English. And Aldo Vidoz was my boss. He was from Argentina. And it was a fairly — I've got to say the metallurgy department at Lockheed was a fairly all-white male place.

I hired the first woman ever into the metallurgy group, and the first Asian. And that was with some strife, people were still very biased. One of my bosses told me we shouldn't employ women because they distract men. [laugh] Well, they do, but [laugh] you know, that's not a reason not to hire people. And just looking at an Asian guy who's very talented, one of the guys there just gave me a thumbs down sign without ever talking to him.

Zierler:

Wow.

Wadsworth:

So that was the '60s, '70s aerospace environment. And it changed. So, anyway, this boss of mine, the Argentinian, he didn't get on with his boss. So, the Argentinian guy, Aldo Vidoz, was a manager, which was a fairly good rank at Lockheed. And then his boss was called a director. That was how it worked. And there were about six directors at the Palo Alto R&D labe and 1,200 people worked there. So you can get a sense that each Director had about 200 people. Managers had 50. But that was the scale of it. And Aldo didn't get on with the Director, so he left, which meant the manager's job was open, and I was seen as a candidate for that. And like many first-level Supervisors I already had a few researchers working for me, but this was a big step up. And basically, to be honest with you, you sort of take that first job because you don't want somebody else to have it. It's not so much that you want it as if you don't have it, this guy's going to have it. And you say, well, I can't deal with him making decisions [laugh] about my future.

So, I was made Manager, and at the relatively young age of 35. It would've been more typically to be mid-40s at Lockheed to get that. And so that was how I got into management. But unlike a lot of managers, I continued researching and publishing. And I had this wonderful side thing going with Oleg on quite a few topics but in particular on Damascus steels.

It turned out that the steels we were working on for technological insertion for commercialization were unusual in that they had a very high carbon content. And we subsequently — as we were researching them for technology, we discovered that they were very similar to ancient swords of Damascus. And so I got very involved in the history of those swords, and duplicating the unusual patterns on their surfaces. And they've a very long, rich history, and going back to the Crusades. Movies have been made that include them and all sorts of controversies over them — still are.

We thought we'd rediscovered how to do it. We still do believe that. We made the front page of *The New York Times*. And the floodgates opened, and all these people started deciding we didn't know what we were doing, or they'd done it already, and stuff like that — archaeologists and people. Anyway, so that was all going on. I lectured on Damascus steels including at San Quentin inside the high-security prison. It was a real blast. And then suddenly 10-years at Lockheed had elapsed, the director who caused Aldo to leave was PARA, to our great surprise, made Deputy Lab Director, the Deputy — number two guy, which meant his job was open. And so that was then "Well, Jeff's going to get that."

But I'd been getting into sort of fight…not fights, but disagreements with him, to be honest with you, and he chose a friend of his for that job, at which point, I didn't want to stay. And some years earlier, Livermore had contacted me, partly because of Oleg Sherby, who was a consultant there. And they'd asked me if I'd be interested in joining them. And at the time, I'd just got this new manager's job, and I wasn't. But we stayed friends, and they'd asked me to be on some review panels. So, when I didn't become Director, I wrote to them saying I'm now looking around. And one thing led to another, and I was hired to Livermore.

Zierler:

Jeff, I'm curious, your years at Lockheed, how much exposure you had to, you know, the larger national security federal policy world?

Wadsworth:

Very little, very little. That happened — that all changed at Livermore. That all changed at Livermore.

Zierler:

So, this was all a new world for you when you got to Livermore, essentially?

Wadsworth:

Yeah. Well, it was a very interesting time. Hazel O'Leary was the Secretary of Energy at that time. And there was a moratorium on underground testing that had been declared by President Clinton. And so there was, in a sense, a lot of uncertainty about the role of these weapons labs: Los Alamos, Sandia, and Livermore. But one of the underpinning assumptions was that since these places were high security, and had done all this amazing work, there must be a lot of intellectual property that could be transferred. And now, you know, that could be a mission. This idea was heavily disliked by many people at the lab, by the way. They didn't agree with it. But there was something formed organizationally to look at it.

So, Hazel basically ripped several hundred million dollars out of the weapons program and put it into a technology transfer program. And there were the three labs — really four labs because Oak Ridge joined in because of Y-12. There was a mechanism put in place to compete for that money. And the idea was you would team up with an industry partner — Ford Motor Company, Boeing, whatever — and you would use laboratory skills and people matched with industry skills and people.

We would use our money. They would use their money. So. they'd be getting a factor of two leverage on their own investments, and we'd be doing something useful. That was the idea. And I was actually hired to run that program at Livermore in the materials arena. There were

five areas, one of which was materials, and each of them had a representative from each of the four labs. And we would meet in places like Albuquerque with proposals from each lab in each area, and fight it out. And out of that emerged a series of programs that then would hopefully light up the U.S. economy by getting all this innovation from the labs into industrial hands. That was the theory, and some of it worked.

We had one of the biggest tech transfers ever in the country when we commercialized uranium separation using lasers. We had another huge one with Intel Corporation on submicron lithography. So big things did happen. But a lot of stuff just, you know, went along, and you wouldn't be able to find evidence for it nowadays.

Zierler:

So, Jeff, in retrospect, was tech transfer the right policy to pursue, in your view?

Wadsworth:

You know, I didn't see anything wrong with it. But it wasn't the sort of big mission that a lot of the giants of these labs, Edward Teller and the weapons leaders envisaged. It was seen as kind of a distraction and "it's not a priority for us. Why are we doing that?" and so on. But I personally thought it was OK.

The reason they hired me for that program was they were worried that if they threw a party, no one would come. And because I'd been in industry, I'd figure that out. It turns out this was a no-brainer. I mean, if you were at Lockheed doing molybdenum welding, and you had 300K, and Livermore said, "Well, we'll put 300K into that as well. Here's three of our best scientists," sure. So instead of it being hard to sell, for every proposal we were able to fund, there were 20 we couldn't, literally. So, you had this really interesting dynamic. If you failed, it was sort of OK. If you were successful, you were by definition now taking market share from some other company that hadn't shown up to share with you, to do this work with you. It's an interesting paradox. So by definition, if you were working with Intel Corporation on making better chips, you were taking market share from their competitors, who suddenly woke up and said, "Hang on a minute, that's my tax money going to Livermore to pay my competitor to be better than me."

Zierler:

[laugh]

Wadsworth:

Right? I mean, that's — if you failed, no one cared. But if you were really successful, people cared. So, Bruce Tarter, who you know well, he and I had some amazing fractious meetings with outsiders on this topic. In one of them — he may have mentioned it — this guy shows up who's a friend of Hazel O'Leary's, and he says, "I want all your patents on micro impulse radar." It's called MIR. "I want all those patents, and I want $5 million in cash. And if you don't do that, I'm going to create hell for you." And we said, "Go ahead." And so he did. He did. [laugh] We were — I received letters signed by 70 Congressmen condemning us for things they didn't understand. And eventually the thing worked its way through the Patent Office, and we were completely legitimate. But Hazel's friend claimed that we'd — that our inventor had stolen it from a meeting in Los Alamos. It came down to things like receipts from parking lots at airports. But our guy wasn't at the meeting. Look, he left the airport — you know, stuff like this. Bruce and I, we couldn't believe what we were going through sometimes.

Zierler:

When did you first meet Bruce?

Wadsworth:

I met him after I joined Livermore, because the interview process for Livermore was really with engineering and materials, not so much with physics, which he was in, or the weapons program, which he was certainly involved in. I had two offers, actually: one from engineering, and one from chemistry and materials. And so I joined and, I went from having a lot of direct people responsibility and direct financial responsibility to very little. And I was really enjoying myself. No money, no people, you know, just money came in with very few strings attached. And then the man who'd employed me, Chris Gatrouris, he was head of chemistry and materials, and he was the one who'd invited me to be on these panels in prior years. The University of California came up with one of these early retirement incentive programs. It was just too good to pass up. I mean, he — you'd be like working for nothing if you didn't take it.

So, Chris decided to take the retirement package, and that left that Associate Director (AD) job, which was a pretty powerful job, open. And this time, I was selected to do that. So, I became AD for chemistry and materials science. That was 500 people and a bunch of money again. But I loved it — being there. It was wonderful. And I got to know Bruce at that time. So probably a year in, I first met him.

Zierler:

And you kind of joined forces with him right away, it sounds like.

Wadsworth:

Yeah, well, what happened was we got on very well. But then he had a man called Bill Locke, great guy, who was his deputy for science and technology. And that was always a temporary role for Bill. He was really into computing and other stuff. So, Bruce was looking for a Deputy for science and technology. So, I've maybe been there now two, two and a half years. And Bruce was looking for a Deputy, and he does the usual thing. He creates a search team of employees — senior employees, mostly. He wanted somebody with industrial experience who was also academic in something. And I think the person chairing that committee turned to him and said, "Bruce, you've got Jeff."

Zierler:

That's right. [laugh]

Wadsworth:

"You know, he's sitting there in chemistry. He's got an industrial background. He's more academic than most of us and we all like him and trust him." And Bruce decided that was a good motive for him to pick me.

Zierler:

Was that a quantum leap for you in terms of — how many positions did you leapfrog to get to there?

Wadsworth:

None. So, there were like six Associate Directors, a Deputy, and Bruce. Because then there was a CFO and an HR person and the usual other support portions. But in terms of technical areas, there were maybe five of us — maybe five or six Associate Directors. And so, yeah, it was a big leap in terms of how many people I was responsible for — my total budget, authority, visibility, all those things. But it wasn't like I leap frogged. It's just that I went very fast.

The local newspaper said my rise at the lab was meteoric, in something they wrote. So, you know, I'd only been there a couple of years, and I was suddenly the number two guy in the science and technology side anyway. But it was a wonderful lab, and Bruce and I got along famously. And Bob Kuckuck was my opposite number in operations. So, basically you had a CFO, and, you know, you had legal people, HR people. But the two deputies, one ran all the operational side of the lab, and the other ran all the science and technology.

And I think Bob Kuckuck, who was the operations guy, he and I worked so well together that I think it really — and I'm only saying this because Bruce told me on many occasions. We never took him a problem. We never went in and said, "OK, I think we need a million bucks, and Bob thinks this. We can't agree." — we never ever did that — never ever. We would recognize we had differences of views, and we'd work it out. And so we had a fabulous relationship. And I think that really helped Bruce to do what he had to do, which was think great thoughts about strategy, and the role of the lab, and so on and so forth. But I was involved in most of the — I mean — I had held very deep clearances there. And I just had an absolute blast — absolute blast. Then one day, Bruce decided he was going to retire, and that opened up his job. [laugh] And I don't know if you read that in my account, but things went to hell. The University of California basically just screwed it up.

There was a guy called John McTague, who was former R&D guy from Ford Motor Company. And he was in charge of selecting — not selecting. He was in charge of the committees that looked at picking the next director, which in classic university fashion was an arcane process. They had committees that dug up names. They had committees that reviewed names. They had committees that interviewed people, and all this stuff went on. And the bottom line was four of us were left standing then. There was me. And then there was Mike Anastasio, who ran all the weapons work, great guy; a guy from CalTech, Steve Koonin, who was a very highly regarded physicist; and then —

Zierler:

I know all these guys, and I have or will interview everybody you're talking about right now.

Wadsworth:

OK. [laugh]

Zierler:

This is great. [laugh]

Wadsworth:

And then there was the guy from Los Alamos, whose name escapes me. But he was a — he was unknown to us. He was unknown. So, we have this interview in Oakland at a hotel. All four of us get a letter saying, "You have to show up at," in my case, "9:00 A.M. on Friday. Go straight to the escalator. Go to the top, and you'll be met by a woman called Layla, and she will explain how you're going to go to the room for this interview."

They were worried that the press leakages and that The Press were all there looking to — trying to figure out who was interviewing for this job. So, it was all very mysterious. So, I get to the top of the escalator, and there is no Layla, but there's some guy who says, "Layla's unwell, so I'm here." OK. And eventually I go in an escalator — an elevator to some floor. And Dick Atkinson, who's — who was the president of the system, and Jud King, who was his right-hand man, they met me — very gracious — and took me into a very cramped room with about 15 people in it. And Dick had learned that you can't control academics unless you have very firm rules on time. So, our instruction was to make an opening statement that was not to last longer than two minutes and 10 seconds, or something. And then it was free-for-all questions. That was the mode of the interview.

And I'd prepared very carefully this opening two-minute thing, and I had a terrific interview. And Dick escorted me out from the interview room, and he basically said, "Look, there are three other people coming in. But you are" — he said, "I had no idea how good you were, no idea." He said, "I'd better shut up because I essentially," — he — "I can't give you the job but you did really" — you know, he was — and I went down the elevator on my own, and I did a whoop.

Zierler:

[laugh]

Wadsworth:

Nailed it. I was sure I'd gotten the job — I was sure. Needless to say, I had a Deep Throat on the committee because some were lab employees. One of them called me and said, "Something very strange happened. We did a vote. We said we know who voted for who. You were clearly the choice" — he thought I'd clearly won the vote. But then Dick McTague picked up all these slips of paper with the names on, and said to Atkinson, "We need to talk because I have information from the customer, the client, the DOE client," he said. So next week on the Monday, this guy McTague called me and said, "Dick's decided" — he said, "You did the best interview." He actually said that. He said, "But Dick's decided to go in a different direction." And I said, "Well, who's got the job?" He said, "Well, I can't tell you, and I'd like you not to tell anyone you don't have it," which was asking a lot under the circumstances.

Zierler:

Yeah.

Wadsworth:

So, I assumed Mike Anastasio had got it. So, I called Mike, and he was in a limo on the way to the airport; couldn't get hold of him. I was in Washington later that week. And I was with Ari Patrinos, who ran the DOE genome program. And I'd done a lot of work with Ari setting up a human genome sequencing center in Walnut Creek. And Ari said, "What's going on?" And I said, "Well, I don't have the job. And I've talked to Mike now, and he doesn't have it. So, Steve's got it." And I said, "Well, they're announcing it tomorrow" — it was a Friday or something — "at 10:00 a.m." And Ari said, "I've just been with Steve. I was in a meeting with him." And he said, "He's here in Washington. He's meeting me in the morning." And I said, "No, here's my prediction. He's going to pull out of that meeting because he'll be heading back to Livermore tonight." And Ari came back and said, "Not so, I just talked to him" — so the fourth guy that none of us knew had got it.

Zierler:

Dark horse.

Wadsworth:

Yeah. That was the guy at Los Alamos. So that was kind of fascinating. So, there we are on Friday morning in Washington, and I'm having lunch with Ari. And we've learned that the fourth guy, whoever it is, got this job. And I didn't have my phone with me, and Ari keeps getting calls.

He eventually answers it, and it's my administrator from Livermore. And she says, "What's going on? I need to talk to you. Why aren't you answering your phone?" And I said, "What's going on?" She said, "All hell is breaking loose." So, one o'clock lunch, 10 o'clock in California, the time for the announcement, and everything had gone to hell because Edward Teller had found out —

Zierler:

[laugh]

Wadsworth:

— that they were about to put a junior guy from Los Alamos in as Director at "his" Livermore. And the weapons guys were furious, and there was a revolution going on. [laugh] And so of course I was delighted. And so on Monday, Dick McTague called me again and said, "We're reopening the search. We hope you're still interested." And I said, "Well," I said, "here's the thing, John, the weapons guys have basically reversed the decision, so they're in charge. I'm not a weapons guy, but Mike is." I said, "I think you've just handed the job to him." And that's what happened. But Mike was a terrific choice. He was a great choice.

But it turned out that Battelle had been trying to recruit me to run the Pacific Northwest Lab a year or so earlier. And that had fallen through for bizarre reasons to do with Secretary Richardson. He wanted a woman in that job and refused to take my name. But I wasn't sure I really wanted the job — but that's actually what happened. It was reverse discrimination of some sort. But I wasn't particularly concerned about it. So, when I went down —

Zierler:

Was that the sign, Jeff — Jeff, was that the sign that you were looking for your next opportunity? Did you know that your time at Livermore was coming to a close?

Wadsworth:

No. No, I was hoping to become Director at Livermore. I was hoping to be the next lab director. And I hadn't really given much thought to what I would do if that hadn't happened. But when Battelle offered me the PNNL job, which they couldn't carry through on, I was at least now aware that I was on a list of people for big lab assignments.

So on the way to Washington for this meeting which I had with Ari — where on the Friday it had all blown up. On the way there, I stopped in at the Oak Ridge National Lab, actually in Knoxville, and had dinner with Bill Madia, Director of Oak Ridge National Labs, and essentially of all Battelle's labs. And he himself had been very disappointed because he didn't get picked as the President and CEO of Battelle. The Battelle Board went to an outsider called Carl Kohrt. And Bill was absolutely sure he'd get this job, but he didn't. But he was running the empire of Battelle National Labs, which was a pretty big job.

Zierler:

Yeah.

Wadsworth:

And he and I were — he'd been the one who tried to get me to PNNL. So, he said, "Why don't you come by and talk about what's going on? We'll have dinner." So, I did, and he said, "So, who's the new Director at Livermore?" And I said, "I don't know but it's not me." He said, "Really?" I said, "Yeah." And he said, "Let's go walk the dog," and he had a Labrador. And we went outside, and he said, "Would you be the Lab Director at Oak Ridge?" He said, "We're going to have to wait a year." Because of contractual reasons, he had to be there for three years, and he'd been there two. And of course, the Oak Ridge Lab was a fabulous place. So, I was very interested.

Zierler:

Yeah. What did you know of Oak Ridge before this moment? Were you aware of what they were doing?

Wadsworth:

Yeah, not in detail, but I'd given lectures there. I'd given talks there. I knew some of their key scientists. And it was a perfect match for me: multidisciplinary energy and materials. And it was a lab director job. What I'd learned at Lockheed, when I kind of got screwed over the job there, was it's a very bad idea to hold a grudges; you want to get up in the morning and want to go to work. You don't want to get up and say, "Well, if I do this really well, it'll make this other guy look good." You want to be happy in your work. And I wasn't happy after I didn't get the job at Lockheed. So, this was very good timing because I only spent a month or so after that interview before I left. And Bill and I had an old-fashioned handshake, and I joined. And Bill was very innovative, a very interesting guy. So, at that time, it was a year after 9/11, and there was a need to coordinate the laboratory response to 9/11. And that was the job I was basically offered at Battelle; was to run the Battelle Labs roles for the new DHS.

Zierler:

It was as a contractor to DHS?

Wadsworth:

Yes. Technically, I was assigned to DHS to their science and technology program, and technically I was a PNNL employee because you couldn't do it directly from Battelle because they were a contractor. And it was a National Lab thing. So, I was commuting from Columbus, Ohio. So, I moved to Columbus, Ohio, and I commuted for eight months to Washington every week and worked on these various programs. There was a guy called Parni Albright who was running the R&D side of it. And that was fascinating, you know, bringing all those agencies together, and all those different people, and trying to get a cohesive program going.

Zierler:

Who were your key partners in D.C. on this mission?

Wadsworth:

Basically, it was all the National Labs, representatives from all the labs, which, as you can imagine, was a nightmare to figure out. Everyone said they could do everything. And the three weapons labs, they thought they could do everything without anyone else doing anything.

Zierler:

And where was DOE in this?

Wadsworth:

The Homeland Security Department was created using some of their resources along with other agencies.

Zierler:

So, it was really DHS that was quarterbacking the whole thing? It was not DOE?

Wadsworth:

Really.

Zierler:

That's interesting.

Wadsworth:

That was a new agency with a new secretary, new structure, very complex.

Zierler:

But the mandates are difficult to understand because the National Laboratories are under the DOE framework.

Wadsworth:

That's right. So, it was confusing. So, what happened was there was a big change underway at DOE also in 2000 and the national Security work was created as a semi-autonomous agency within DOE called NNSA. General John Gordon, who died recently, was the first head of NNSA and he elected to keep all of the infrastructure of DOE for things like salaries and benefits and pensions, all that stuff, which was a very controversial decision because there was a thought that you could really pull out all the good stuff you need, and leave all of these decades of bureaucracy behind. But that didn't really happen. So, you know, NNSA had been formed and they were part of the response to Homeland Security, and General John Gordon ran that piece. And after eight months, DHS became a separate — or a real cabinet position or an agency. And at that point, I was not eligible to work for them.

Zierler:

Why not?

Wadsworth:

You had to join them.

Zierler:

Was that offered to you?

Wadsworth:

Oh, yeah, but, you know, it was never on my screen to become a federal employee for them and — but some people did join and became permanent federal employees.

Zierler:

But you had Oak Ridge in your back pocket this whole time?

Wadsworth:

I had Oak Ridge in my back pocket informally but no promises. Battelle couldn't do that because they would — there would have to be a search of some sort or some — well, the Secretary of Energy had to approve the decision, or his deputy did. But obviously a contractor of Battelle's size and scope, if they wanted somebody in as Lab Director, mostly they could make it happen. Although at PNNL it didn't for an anomalous reason. But so, yeah, I had this job in my back pocket all the time.

Zierler:

Were you looking to impress DOE people with the selection at Oak Ridge in mind? Was that part of it?

Wadsworth:

No.

Zierler:

It didn't matter?

Wadsworth:

No. No, I was doing this kind of work with DOE money for Homeland Security purposes. It was all getting sorted out, and it was interesting work. It was pretty good. And then as time went on, the following year in August I think, Bill was able to step away, and he took on the formal role of running the labs for Battelle, which he was doing anyway. And I had various interviews with DOE, and was approved as Director of the Oak Ridge National Lab. And that was a wonderful thing, a wonderful thing.

Zierler:

That must've been a very exciting moment for you when that announcement came out.

Wadsworth:

Yeah, you know, it really was. And, you know, there was no animosity at Livermore at all. They were all thrilled that I became a Lab Director. It was just UC, and in particular one guy, John McTague, who really made a hash of things. George Miller made it very clear as well, right. Do you know George?

Zierler:

I don't know George, no.

Wadsworth:

George was running the weapons program for Livermore. He actually was also Director. He was Lab Director for a while, subsequent. George was quite a fierce guy. And when we had our first meeting with UC following this debacle, at which Mike was announced, he just let rip into the university over how they'd embarrassed themselves and the country in this nonsensical selection process. And he was right — he and Mike Anastasio were very close. But, you know, there's no animosity at all. I understood that this was political. Mike was a great guy. On retrospect, I think it worked out very, very well because Mike was better at the Livermore job than I would've been, I think. And I was better at Oak Ridge.

Zierler:

What did you see as your mandate as incoming Director at Oak Ridge?

Wadsworth:

It was fascinating. It was fascinating. Oak Ridge had been — there were — and by some listing — there were lots of different lists of national labs, you know, the single purpose, multipurpose, big, small, so on. But then at some point, there was like 31 labs, and somebody

had ranked them, and Oak Ridge was 29th. And it looked like you were still in World War II, when you went there, you know, crappy infrastructure.

And Madia, Bill Madia, had done a fantastic job of creating the start of a revolution to bring that lab into the 21st century. He'd done a spectacular job — he brought in a whole new team. He'd won the contract for that lab from Lockheed who were asleep at the wheel. But it was barbed-wire fences, and it was just terrible. And Bill had started the process of how do you bring this lab into a new environment, and make it excel? And he handed me those reins, and it was wonderful. We created something called "third-party financing", which was almost a shell game but a very legal one. But what we did was we were able to borrow money, and build buildings that DOE would need, using private capital, and then lease them back to DOE. So instead of it being a line item, approval by Congress, we could just go ahead and move fast. And Bill had started this, and I continued it, and we built three buildings this way, big buildings. And one of them, we took a business risk, and built one acre of world-class computer space, one acre. No programs put in it. But we were pretty good at computing. But Argonne and Berkeley were better. So, we built this building, and then we built another one, and then we built a third one.

Zierler:

So, you saw an opening in computing?

Wadsworth:

Oh, yeah.

Zierler:

Yeah, you did.

Wadsworth:

Oh, yeah. And we had a leader there who's now the Lab Director called Thomas Zachariah, and he was running a very, very good program on a very thin budget really. So we…

Zierler:

Were you using the term "exaFLOP" in those days, or that came later?

Wadsworth:

No. [laugh] No, TeraFLOP.

Zierler:

TeraFLOP, right.

Wadsworth:

I even got a clock inside a box with an award for one TeraFLOP from Livermore. That's where we were. But Thomas was very good, and so we took this business risk. It was a business risk. So, we'd invested all this money, but we were leasing the building back to DOE. And then we did it three times. Actually, we did it four times in the end. And I'll just sidestep to say I think it was the IG who came to investigate us. And they said to me, "I don't know what you're doing here but, you know, you've managed to build all these buildings and get all these wins." — and of course because we were building these buildings, we're starting to win things — the computer being a big one, which I'll get to in a minute. But they actually investigated us — me.

Zierler:

On what? For what? What were you doing?

Wadsworth:

They were suspicious. It was like, "How did you build these buildings when normally it takes 10 years to get one." — so how do you get a building in DOE? You ask for one, and they say "no" three or four years running. Then they put it in the budget —

Zierler:

[laugh]

Wadsworth:

— and somebody in Congress says "no" for three years. And then after seven or eight years, you get an approval, and then it takes four years to build it.

Zierler:

Right. So, what they were really investigating is how well you mastered the bureaucracy?

Wadsworth:

Yeah.

Zierler:

[laugh]

Wadsworth:

Yeah, and they sent me a letter. They sent me a letter a few weeks later, and it was a wonderful letter. In the front end of it, it says, "What you have done — we've looked into all of this. What you have done is legal, comma," that's good, "highly innovative, comma, and we don't like it."

Zierler:

[laugh] How dare you? [laugh]

Wadsworth:

[laugh] Yes. They didn't say we don't like it. They said "but" and then they had a bunch of caveats. But we'd done everything legally. It was completely legal. And we built our building with the computer in 18 months at 200 bucks a square foot. And DOE had built a building nearby, and it took four years and 370 bucks a square foot. And the State of Tennessee, as part of the contract we won, had agreed to build a building, and they were in the middle. You know, it was like they took nearly three years and 300 bucks. So, this private way of doing it was just fabulous, and it gave us a platform.

So, we won the big computing program. It was a big deal because we — everyone thought Berkeley or Argonne would win it. And when you win the biggest computer in the world program, you attract the best people in the world because they all want to be on that computer, either as computer scientists or as users, because you've got more power than anyone else to solve a problem, and they want to all win the Nobel Prizes or whatever. So, we won that. Then we won a big biology program. And then we won a big National Security program. So, we were on a real tear. It was an absolute blast.

Zierler:

How involved were you in recruitment? I mean, personnel obviously has to be central to this story.

Wadsworth:

Yes, so I would — as in most of the jobs I had, I would be personally interviewing leaders. But I wouldn't go too far down because I wouldn't know enough to know whether somebody was the best research scientist or — but we had all sorts of committees evaluating our work and

our people, so I had various other ways of assessing how we were doing. But basically, we were seen as rocketing up that — we ended up being perceived anyway as number one on that 31-list.

Zierler:

That's remarkable.

Wadsworth:

So that was the achievement. That was the achievement. And, you know, Bill Madia got it going, and I think I was able to do a very solid piece. And then Thom Mason took over from me. So once again after four years, Bill Madia retired. He'd had five years in this role which had been created for him after he was disappointed not to become CEO. So, I was recruited back to Battelle, Columbus, to run all the labs.

Zierler:

Now had you felt at this point after four years that you essentially had accomplished what you'd set out to do?

Wadsworth:

Yeah, a little bit — a little bit. But I had tremendous learning experiences there because for the first time in my life, I was of the — when you're a Lab Director in a state like Tennessee, you are a big fish in a pond. You're a big fish. At Livermore, you're really not because you've got Silicon Valley 17 miles south of you. But in Knoxville, you're a big dog. So, I knew the Governors. I knew the Senators. I knew the Congressmen and women. I knew everyone. I was deeply entrenched in the politics of the state because when they want to talk to somebody, they only want to talk to a Lab Director. It wasn't that they wanted to talk to Jeff. They wanted to talk to the Lab Director, whoever it is. That's where they meet at that level. So, I was heavily involved with the local business giants. It was fabulous. So that was a really exciting world. But, you know, after four or five years, you start to see the same things happen a little bit, you know, you — I always thought five to seven years was the optimum time to be in a high-powered job because either the world changes or you do, and you're not going to. You are who you are. So, I saw people revitalized after 9/11 because their world changed. Their world changed. They went to 24 hours a day instead of eight, you know, that kind of thing.

Zierler:

Jeff, in terms of above you, at your level at Oak Ridge, who were you working with in Washington? Is it mostly DOE? Who are the Institutional partners there?

Wadsworth:

Mostly DOE because most of the budget came from DOE. But it came in a lot of different segments. But I was mostly working with DOE mostly in the Office of Science, but also in all of the other departments, NNSA, other entities. Because we had a very broad-based budget, and it was growing. You know, we were going up in terms of budget and head count. And it was a ride, you know.

I remember giving a speech to a fairly large group of political people as well as lab people and others. And they asked me about the growth, and I answered in a roundabout way. I said, "I love this country. I love everything about it. I've one objection." I said, "I don't like the NFL draft. I don't like this business of parity. I like dynasties." And the place erupted, you know.

Zierler:

[laugh]

Wadsworth:

I like dynasties. We wanted to be number one in everything and, you know, win everything. And, yeah, we've won the biology and the computing and this. But we also want to win this, you know. We don't believe in handing — smoothing things out, you know. So, we were very competitive, quite aggressive.

And we also built the Spallation Neutron Source at that time under Thom Mason's leadership. He was a very young guy doing it then, and that was built on cost, and scope, and schedule, which was a rarity for something of that cost. At Livermore, we had NIF, which was [laugh] — you know, it cost four billion instead of one. And the Spallation Neutron Source was on target. So, we were — it was a fabulous four years. But then —

Zierler:

The opportunity at Battelle was the right opportunity at the right time?

Wadsworth:

Yeah, it was the right thing to do. It was to go and now see how could we continue that — those philosophies and practices across the labs. And I knew all the Lab Directors of course. And I think that job was one that required a very even hand and trust, because you're going to have to make decisions about which lab got positioned for which purpose, sometimes against what they wanted to do. But we tried to let them do their thing. But, you know, it was an interesting job. So, I was then working for Carl Kohrt, who was the president and CEO of Battelle. And I had this very large responsibility, and we won a couple of labs in addition at that time. And we won the UK National Nuclear lab. We renewed the National Renewable

Energy Lab, NREL. So, we were — you know, we were winning stuff as well as maintaining stuff. And no, I don't think anyone could touch us as a contractor — they just couldn't. We were just in a — and, again, I'm giving a lot of credit to Bill Madia on this. We were in a — we were just better. We were just better.

Zierler:

Did you see this as a lateral move?

Wadsworth:

Going from Oak Ridge to running the labs?

Zierler:

Right.

Wadsworth:

No, no, I saw it as a —

Zierler:

It was a step up?

Wadsworth:

— different job — different job and a step up, yeah, very much a step up, yeah, and posit…

Zierler:

Because you're now in charge of multiple sites?

Wadsworth:

Yeah, I had eight national labs at the time. I had eight. And my job was to ensure they were all doing well, that they were all being understood by the clients, so like DOE and DOD and whoever was responsible for them. It was very complicated. The labs were all — had their own cultures and dynamics. Brookhaven was highly academic. You know, it just varied a lot, and we were —

Zierler:

Were you traveling a lot to the different sites?

Wadsworth:

Oh, yeah, oh, yeah. If you look in my book, towards the end I listed all the trips I took one year, and there's like a page and a half of single space, yeah. I was on the road all the time. But once I got to Battelle, at least after a few months, I was able to use one of our planes. So, we ended up — when I became president and CEO, we had two planes. And eventually I sold one of them and bought a second jet. So, we had two Hawker jets, and they were used — you couldn't do these jobs without a plane. You'd die. I mean, you couldn't go to Brookhaven and Oak Ridge and the Pacific Northwest and down to Livermore. I mean, you'd be — all you'd be doing was sitting at airports and getting trapped by airlines not showing up on time, and stuff like that.

Zierler:

Now was your sense that this new position was only going to last two years? Did you feel like you were being groomed for the top spot?

Wadsworth:

No, no. People have often asked me, "How did you plan all of this?"

Zierler:

[laugh]

Wadsworth:

And my answer is I didn't. I really didn't. It's one of those funny things. You look backwards, and it seems very evolutionary.

Zierler:

That's like asking how you planned to have that light bulb go off when you were 20 years old. [laugh]

Wadsworth:

Yes [laugh], yes, that's right. That's right. So, no, I had a very strong philosophy that you should put 110% into every job, and be passionate about it, and then good things would happen. Now, was I conscious that there was a CEO job? Yes, I was conscious of it. But basically, Battelle had two arms at that time: all the labs and all of the contract work at Battelle, which was about a billion dollars. And I had five billion but it's a different color of money. And so the guy running the billion was an obvious succession person, or should be, and the guy running the labs should be, or there's an outsider.

You know, those — it would be unusual to have somebody other than those two people be in line to be CEO, and leapfrog either myself or the guy doing the other job. And so after a year, or a year and a half, the CEO decided to [laugh] — you see, it's like I show up, and people get pushed out. But they weren't. They just — it was just their age and timing. So, he was 65. And the agreement at the time was you had to retire at 65 if you were an officer of the company, as a refreshment thing. It was just seen as good policy. They actually changed it for me, and pushed it out to 67 —

Zierler:

Oh, that's nice. [laugh]

Wadsworth:

— which was a nice compliment. But Carl was 65. And so the process for a search by the Board so — now Battelle's run by a Board of Directors, just like a — this phrase "non-profit" is very misleading. I refuse to use it. I used to say we were tax-exempt, and that's a business advantage. "Non-profit" implies all sorts of nonsense that — we made as much profit as we possibly could because we had this wonderful purpose to give money away, in particular to kids who wouldn't otherwise make it, was the mantra I used — kids who wouldn't otherwise make it. And you had that, and then you had reinvest in the future. So, we wanted to make as much profit as we could to be as strong as we could in the future and to have a wonderful impact on society through education. So, it was fabulous, and that was the job.

The — my opposite number kind of shot himself in the foot when he learned he wasn't going to be a candidate and departed Battelle. So, I was left standing, really. [laugh] I mean, there was me or somebody they didn't know and — is the way I sort of came to look at it. But the Board went through all this stuff with a search firm and this, that and the other, a bit like the time when Bruce decided I — why not me, because I was there and qualified. Yeah, it was a bit like that. They suddenly said, "What the hell are we doing? You know, give it to Jeff." And so they called me into a Board…

Zierler:

Well, what about the same idea way back in Lockheed where you said, you know, you took the job not because you wanted it but because you didn't want some other bloke, you know, thinking about your future?

Wadsworth:

Yeah.

Zierler:

Same idea, or this was a different world?

Wadsworth:

Yeah, no, look, that's a fair comeback at me on that. It would've depended who was given the job. If it was somebody three layers down in an obtuse part of Battelle, I would've wondered why. But if they'd brought in the head of GE or something, you know, I'd have said, "Oh, I see." You know, it would very much depend. But, no, I wasn't looking to leave if I didn't get the job. I didn't have anything else lined up. I had no aspirations to go anywhere else.

Zierler:

And you were happy in this role? I mean, there was a lot of travel, but this was good? This was good for you?

Wadsworth:

Yeah, oh, yeah, it was fabulous. I mean, you saw every cutting-edge piece of science going on. You were interacting now with — I was interacting a fair bit with Ohio politics; not as much as I would be when I became President and CEO. But nonetheless, it was a very highly community engaged job. And, yeah, it was fabul…I mean, I was enjoying myself.

But then at one Board meeting, I was — we knew the search was underway. We knew that, you know — they called me in and said, "We'd like you to be the next President and CEO." And I said, "OK [laugh], great." [laugh] Everyone was waiting outside for committee meetings, and it went on and on, and we were like an hour of doing nothing. And then they called me in, and they all applauded me, and we took a snapshot of the Board and myself. And I sort of remember saying, "Well, we [laugh] better get on with the committee meetings. Everyone's waiting." Whereas that's — is never discuss salary. Never discuss money.

Zierler:

Was there an expectation that with new leadership was going to come a new direction for the company, or was your sense was from the Board of Directors, you know, keep the ship on the course it's on?

Wadsworth:

Well, it — the company had been doing OK. It wasn't like it needed surgery — radical surgery. It was more a question of externalities. I mean, this game we're in is so dynamic. I mean, like right now, COVID-19, you know, Battelle's in *The Wall Street Journal* yesterday because of the face masks they say they can clean 20 times. And they've had $400 million of business

from the feds, and the average cost of a face mask is 120 bucks or something outrageous. And that's because that's a good journalist story. As they produce millions of them, it'll go down, but that's not an interesting story.

So, you know, everything changes. And so it wasn't so much it needed to change direction as you needed to be very agile, and anticipate what the next wave of change was. You had to know whether you were getting into trouble on programs and fix it. And then of course there was what's the near future? But that was always the case. It wasn't that Battelle didn't have a plan. It's just we were continuously looking at strategic change. You had to. You had to. So, it was more — it was going to be different, but not because of something Carl had or hadn't done. It was more just the nature of the beast.

Zierler:

Who were the major competitors to Battelle? In other words, a project that you didn't get right, who was going to step in and do it that you were thinking about?

Wadsworth:

Well, there were people who were small versions of us, like MRI, SRI, the so-called non-profits, you know. There were those. But we didn't see those as our competitors. They were, but they weren't interesting. Lockheed, Boeing, major military industrial providers, they couldn't stand us. They couldn't stand us. And they would resent the fact we were tax-exempt because we could price things maybe a little better. But, no, it was industry mostly.

Zierler:

Maybe also that you're — that Battelle was a bit more nimble? It could move faster on things?

Wadsworth:

Yeah, we could — we didn't have any of the — I mean, not any. We followed all the rules and regulations, environmental safety and health. I mean, we were very, very good at that. That was something I transformed at Oak Ridge, by the way. They had a terrible safety record, and I took it to number one in the country by a lot of hard work. Because you couldn't afford to have a bad safety record. You could be shut down overnight if somebody died. So, we were very conscious about safety. I learned a lot about safety, as a matter of fact. But, no, the competitors were everywhere. It wasn't monolithic at all. Could be the private companies, public companies, other labs.

We were moving into Asia at the time. That was something Carl had done, which I ended up reversing. He believed that we should be — we should have presence in Asia. And it seemed like a good idea at the time. Asia was burgeoning and — but, you know, deep down I always

felt it's hard enough to win business in the US, you know. Going to India, and winning a major program is — that's tough. But we tried it. But over the first couple of years I was there, I just couldn't see the business return. Nobody was winning anything big. We had some success in Malaysia but — so if somebody in Malaysia wanted to build a lab, we could do that for them. We knew how to do that. We start competing for contract research in India, you know, pricing is — you're not going to do it. Japan, we thought we could do something in Japan, South Korea. I visited all of these places. China, I did a lot with China. I was actually elected to the Chinese Academy of Engineering, which is unusual for an American. Not unheard of, but not so usual.

Zierler:

Jeff, I'm curious if at this point in your career, you're so far removed from your science background that you're really not relying on that on the day-to-day, or are you?

Wadsworth:

No. No, I think somewhere in the — I continued publishing occasionally, but it was more people were being very kind to me. Something we've thought about 10 years ago, they're finally publishing, they've put my name on. And I'd say, "Well, let me read it, and make sure I make some sort of contribution." But that was the extent of it.

I was a businessman. I had to become a financial business-person who could judge where to make money. Because although we had this wonderful philanthropic and purposeful mission, we were evaluated on the bottom line. My incentive compensation was financial, not "you did a good job with the school". It was "here's your targets and here's your financial target" — you know, just like I do at Carpenter now with them. It was a financial job. It was a community job, big-time in Columbus — big-time community job. Everyone wants something from Battelle. You know, you're seen as having a lot of money that you can give away, so why not give it to me? So, I had to deal with some really interesting philanthropic stuff. So, I spent a lot of time on philanthropy, you know, and I did some very unpopular things. Like I didn't like the United Way. I didn't like it.

Zierler:

Why not?

Wadsworth:

Well, you paid money to them, they paid themselves actually quite a lot of money, took stuff off the top, and then gave to something you might or might not like. We were big enough that we knew what we wanted to do. We wanted to get into STEM education and a few other things, and we just didn't need the United Way. And the way we got money from our

employees was through a United Way program. And so in Columbus, there was — as in every city, there are different areas around the city where people live. So, if you lived in Dublin, Ohio, which was a popular place to live and work at Battelle, and you gave to the United Way, it didn't go to Dublin, Ohio. It went to Downtown Columbus. So, people weren't giving because they knew that their money wasn't going to their local programs. And a lot of philanthropy is local. So United Way, interestingly, changed their own philosophy, and had a program where you — when you gave the money, it went to your district. And that meant that it didn't go to Downtown Columbus. So, the woman running the program in Columbus lost half her money when United Way introduced their own program. My thinking was an extension of that. It was why not say you can give to United Way, and have them spend it in Downtown Columbus; or you can give to United Way, and have them spend it in Dublin, Ohio; or you can give directly to a registered charity of your choice. It's all about choice. I'm not saying you shouldn't give to United Way. I'm just saying if you'd rather your money went directly — and nowadays, even then, people would get online, and investigate these charities, you know. And they'd find they get one star out of five because they're not very good. And so they'd say, "Well, I don't want to give to them." And so it became much more of a direct giving program. And as a result, we tripled how much employees gave. It just went through the roof, because we had always matched. We match. If you give a dollar to the dog pound, we'll give a dollar. You can't use it for tithing at churches. That's your problem. But if your church has a 501(c)(3) that gives food away, we'll let you give to that, and we'll match it.

So we put a lot of structure into philanthropy, and that caused — not caused. That was a very — we were seen as leaders in a new way of doing it, actually. A lot of people wanted to do it the way we were doing it. So, I think United Way was very interesting back in the '50s. You know, you didn't know who was in need, and you had this central agency that was — their job was to find that out, gather money, and spend it in the most effective way possible to help society. That was the United Way purpose, and it was a great purpose. But as time went on, they didn't keep up with other ways of doing it and make that easier for people to do.

So, we ended up giving a lot more money away all to good things. We checked everything that people wanted to give to. You know, we did [laugh] — we weren't going to have matching money go to some organization that wasn't appropriate.

Zierler:

Right. Jeff, I'm curious —

Wadsworth:

But that was a big job in the community. That was a big community in Ohio.

Zierler:

— your tenure coincided almost entirely with the Obama administration, and he had two physicists at the Secretary — as the Secretary of Energy. I'm curious if that was a notable fact for you, if that changed, you know, your responsibilities or your relationship with the administration or Washington in general?

Wadsworth:

Not really. Not really. The Nobel Prize winner was — you know, he was always hard to deal with. [laugh] He'd never met a problem he couldn't solve better than you. But it was interesting having scientists at such high rank. And, no, I thought it was fine.

Again, it's like all organizational things, they can set a tone, just like I was at Battelle. You can set a tone. But you go four layers down where money changes hands for services, and people know each other and, you know, it either works or it doesn't. There were certain things that we were able to do based on leadership, big things. Like the Human Genome Program back in the '90s, that was a very bold move by Ari Patrinos. We sequenced three chromosomes. And the major fight was between the, you know, NIH and the private sector. But being — you needed to have somebody at the top of DOE who wasn't going to scupper that.

Like when I was at Oak Ridge — I'm trying to remember who it was — somebody came in and said, "Why the hell do you guys deal with mice? That's not your job. That's NIH's," or something, you know. And I said, "Well, when you have radiation damage to living matter, you'd really rather be experimenting with mice and not humans, and understanding if you're changing gene — you know, corrupting genes and stuff."

So, people just didn't understand things like that, so you needed leadership that did. I mean, there was huge interest in the National Labs on medical stuff, and we developed some — well, we developed the fast sequencing methodologies, and it came out of the weapons labs. It came out of Livermore and Los Alamos. It wouldn't have been done in the private sector. And the ambition to do three billion base pairs, nobody had it except the labs. And then it became mainstream for the private sector and NIH. But actually it all started at the weapons lab, which is very curious and doesn't get a lot of acknowledgment. But that's where it started.

Zierler:

That's right. People think that it all started at NIH. It did not.

Wadsworth:

It didn't at all, you know. And I was part of a meeting in Bermuda for the standards for sequencing, which I didn't know anything about. I didn't understand, I mean, it just wasn't my thing. But I was seated in a — alphabetically by surname, 30 of us at a horseshoe table. So, I ended up next to Watson, James Watson.

Zierler:

Pretty cool. [laugh]

Wadsworth:

Yeah. And after about 20 minutes, he turned to me and he said, "Who are you and why are you here?" [laugh]

Zierler:

[laugh]

Wadsworth:

And I said, "Well, I can answer who I am. I can't tell you why I'm here."

Zierler:

[laugh]

Wadsworth:

He said, "Well, what do you do?" And I said, "Well, I'm a metallurgist by training." And he thought about that for a minute or two, and then he turned round and he said, "You mean you're a metallurgist," using the English phrasing for it. And we got along fine. But, you know, I mean, things like that would happen on a — I mean, what a job, right?

Zierler:

Yeah.

Wadsworth:

Fantastic. So, yeah, so I became a businessman and a community player, and dealt with politics. So, the then —

Zierler:

What were your — what would you say is your — were your main achievements in, you know, leading Battelle?

Wadsworth:

Well, I think I took a pretty good organization, and made it somewhat better in turbulent times. Because I was CEO in '08 when the crash hit, so we had to make a lot of difficult decisions, a lot of directional decisions. We couldn't just keep doing what we'd been doing. We had to anticipate where the markets would come back, where our value would be found. So, I think leadership in turbulent times without seeing permanent damage to the company was one of them. At Livermore, I was there during more of a tricky start but then a burgeoning era. So, you know, you have to manage through different externalities. And keeping calm is very important. You can't be seen to be excitable about stuff. Employees get very nervous if they see you worried or overly concerned.

Zierler:

That's not to say that you don't worry. You just don't convey that.

Wadsworth:

That's right, you do worry. But, you know, people would ask me about the pressure of the job, and I never really felt it that way. You know, I was surrounded by great people, you know, at every level. I had a style of very open communication. I met anyone who wanted to meet me. And I think it — you know, somehow that was all — all worked in my favor. It was — I didn't make enemies. I mean, I had to fire people, don't get me wrong. But mostly it was a — I woke up wanting to go to work. And I didn't — I mean, there were times obviously where, you know, you had the pressure. I remember once we had to write down a facility. We'd built this big facility in Columbus, on the outskirts of Columbus, for medical purposes. And the work just wasn't filling it, so I had to write it down. So, you learn certain phrases in this. It's a one-time non-cash [laugh] and that's the phrase you use, you know. It's non-cash.

Zierler:

Non-cash.

Wadsworth:

So, you have all this business coming in and you have — you make money or whatever, and then you have an asset that is no longer worth 200 million. It's worth 50. But it's kind of, well, OK, so what? It's still there. But then on your income statement, you have to show that loss of 150 million, and that's a bad news day. So, things like that I'd certainly be stressed about. And

the Board wasn't happy, but I wasn't happy. Actually, they told me, they said, "You better warn the community about this $200 million write-down, otherwise you'll" — technically, we were a registered charity in the State of Ohio. And in the State of Ohio, as in 30 other of the states, those entities are held responsible by the Attorney General of the state. So, we had a relationship with the Attorney General — five relationships in my [laugh] time in charge. And we would write a letter every year saying, "Here's what we've done, and here's — we haven't exported jobs, we haven't this, that and the other." And the Board was worried that they would be exorcised or by this loss. It turns out they weren't.

But I started telling key members of the community or giving them a heads-up. One of them was Les Wexner of L Brands. He's a very powerful man in Columbus, and I knew him quite well. And I went to see him, and I said, "Les, we've got some bad news coming up." And he said, "What is it?" And I said, "We've got a $200 million write-down on a building." And he said, "I've done 250 million." [laugh] You know, competitive to the last. [laugh] He'd done a bigger write-down than I had. And then I talked to AEP and Huntington Bank, and they were all in the billions. It's just a piece of doing business. You know, sometimes you build something, it's — and a year, a year and a half later, we're filling those buildings you know. But at the time, it was a worry. So, there were things like that. But they weren't — it wasn't like I woke up with dread every day. I didn't.

Zierler:

Jeff, when did you know it was time to step down?

Wadsworth:

Well, when I was 64, there was a Board meeting, and they said to me, "You know, it usually takes a year or two to find somebody." And Carl had demonstrated he'd been working on me for a year and a half or something. That was on their minds. A little bit of revisionist history there, but that was about right. And they said, "That's only a year away. That's not a lot of time." And it was really up to them to do that process, not me. And so at that meeting, they asked me if I'd stay on till 67, 2017. And we had a little bit of a joke about what date. I said, "Well, there's several dates. There's January 1, there's my birthday, and there's the end of the fiscal year, and the end of the calendar year. So, it's four dates." And we agreed on the fiscal year end, so September 30th. So that was just a decision that was made up front that I would be CEO until that date. And so then I became part of the process also of selecting the next CEO. But it was the Board's decision, but I was asked to help, which I did. Now I think the more —

Zierler:

What were you looking for in a successor?

Wadsworth:

Somebody with great enthusiasm who could carry the company forward, anticipate the changes that were coming up, and had a demonstrated major role in leadership already. Because I don't think you want to jump into these jobs if you haven't had — a Lab Director is really like a President and CEO. You know, you have autonomy over a large complex organization, and that's the experience. You obviously grow into the job. But if you jump into it from too low of a level, you could get into trouble. So, you want a certain experience, and the experience you want is some version of a prior CEO-ship. So Lab Directors are a great pool to look at. They've had to deal with the community. They've had to deal with the politics. They've had to deal with money. They've had to deal with changing environments, complex customer relationships. And then you hope that that translates one level up in size. And that's really what I had and did, so I was looking for that.

Zierler:

Do you feel like your mission was accomplished in terms of leaving the company in strong new hands?

Wadsworth:

Yes. Yeah, I do. And the Board were very kind to me and very appreciative, and expressed that in various ways. The thing I would say about longevity in those jobs is I broke my own rule a little bit. It was eight and nine years instead of five or seven years.

Zierler:

I just wanted to ask you one last broadly retrospective question about your career, if that's OK.

Wadsworth:

Yes.

Zierler:

So, if you can — it's a retrospective question but it's also forward-looking. And I'd like you to think about, you know, the sum total of your career in private industry in the National Laboratories within the federal bureaucracy and framework, right. What do you see as the best way forward for that complicated mix of the National Labs, private contractors, and D.C.? How does that complicated relationship work in the best way forward for our country looking to the future?

Wadsworth:

Well, the simple answer is leadership, and who gets in those jobs. And if you get a career bureaucrat running DOE who doesn't know what science is about, that's not going to have a good outcome. And if you have a scientist who doesn't care about safety, it's not going to have a good outcome. So, you need leadership that appreciates the history and the breadth of these organizations, and their relationships. And without that, you can go ahead — you can go off in a very bad direction.

Zierler:

Right, right. Well, Jeff, it's been phenomenal talking with you. I really appreciate —

Wadsworth:

Yeah, it's been good.

Zierler:

— your perspective.

Wadsworth:

Sure.

Zierler:

I'm so glad you wrote that book because it was great prep. But it was great to hear it in your own voice. So, I really appreciate your time. Thanks so much.

Wadsworth:

Thank you, David.

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