THE DEPARTMENT OF ENERGY ORAL HISTORY PRESENTATION PROGRAM

OAK RIDGE, TENNESSEE

AN INTERVIEW WITH DR. JEFFREY WADSWORTH

FOR THE

OAK RIDGE NATIONAL LABORATORY ORAL HISTORY PROJECT

INTERVIEWED BY

STEPHEN H. STOW

OAK RIDGE, TENNESSEE

JUNE 15, 2007

TRANSCRIPT BY BRIAN VARNER

STOW: Today, we're interviewing Dr. Jeffrey Wadsworth. Jeff has been director of the Oak Ridge National Laboratory since 2003 and is leaving in the near future to assume a new position at Battelle Memorial Institute in Columbus, Ohio. [At the time, ORNL was managed by a partnership of the University of Tennessee and Battelle for the Department of Energy.] We look forward to some insight from Jeff over the next hour. Welcome. It's good to have you here today.

WADSWORTH: Thank you, Steve, good to be here.

STOW: What I'd like to review with you today are some of your early years and what got you into science and what some of your thoughts were at that time. Then we'll jump and spend most of the time on your three or four years here at ORNL. And then, we'll wind up with some introspective views on your part. You were born in Germany. You're of English heritage, of course, and you lived at many different places around the world --Yemen, Singapore, Germany, Holland, and other places. This is quite a diverse background. Do you think that that diversity has helped you in your professional career and giving you broader perspectives?

WADSWORTH: Yes, I do think it has. And, you're quite correct. I was born in Germany, then lived in Holland. Then we went to England. Then we went to India. Then we went to Singapore. Then we came back to England. Then we went to Bahrain in the Persian Gulf, then to what was then the Aden Protectorate, then the People's Republic of South Yemen, and now it's Yemen. Then we ended up in Berlin – in West Berlin – during the Cold War in 1966. And then, my father died and I went back to England at age 16. So, it was very disruptive from a schooling viewpoint.

STOW: I'm sure.

WADSWORTH: Every two years I was moving to a different school. Toward the end of that era, I actually went to boarding school for two or three years. I think living in India and the Middle East had a huge effect on me in terms of becoming familiar with the different cultures and seeing things from a different perspective.

STOW: I suspect that the international and interdisciplinary nature of the staff here at Oak Ridge National Lab has also given you the ability to deal with people from different cultures.

WADSWORTH: Yes, I think so. I think it helps. I'm sure you don't have to have had quite the lifestyle [I had] to also be able to appreciate other cultures. I think at last count we had people from about 80 different countries here at Oak Ridge. And certainly, I've also traveled quite extensively in my professional career to Russia, China, South Korea, and India, most recently. I certainly am very comfortable traveling to those countries; because, in some sense, I'm visiting places I've been before.

STOW: Sure. Your professional training was in the field of metallurgy and material science.

WADSWORTH: Yes.

STOW: Can you think back to when you first realized you had an interest in science?

WADSWORTH: Maybe because of the travel I did or maybe because of my intuitive abilities, I wasn't a particularly good student, or at least, I certainly oscillated between being okay and not very good in the years from 11 to really about 20. And in England at age 16, you had to make a decision between the arts and the sciences. So, at age 16, you have to decide whether you're going to do English, literature, French and history, or whether you're going to do math, physics, and chemistry. And my ability at French made that decision very easy, and I went into the sciences.

STOW: (laughs) The lesser of two evils.

WADSWORTH: Yes, the lesser of two evils. Nobody in my family stayed at school beyond age 16, so there was no expectation for me to do that or to go to college or university. But, my high school teacher in York, England, was quite insistent that I apply to go to college. He was my chemistry high school teacher. He actually told me I wasn't doing well enough to study physics or chemistry or math, but I could do either pharmacology or metallurgy. And after a few weeks, he asked me which college I had applied for, and I [told him I] hadn't done anything. So, he gave me a book called *Metals in the Service of Man,* but I didn't actually read it. But since I had a book on metals, I applied for [a university strong in] metallurgy. So, this was a very serendipitous route. I went to Sheffield University, and for the first couple of years, I struggled. I managed to get by, I passed exams, but I wasn't doing very well. And then, a professor named Gordon Richardson spent a lot of time with me on a mathematical proof in metallurgy that I didn't understand. And, at some point in that explanation, light bulbs went on in my head. And from then on, I was very, very interested in the subject and felt I could cope with it. I really went from strength to strength and got a good degree and went immediately into a Ph.D. [program]. And from then on, science was fun. I won prizes, but up to about age 20, I was not very good. So, nowadays, when I look at our educational issues and the S&T [science and technology] needs of this country, I worry about how many kids we lose, because they did not have that kind of mentorship or somebody to help them along at a critical point.

STOW: Was it a difficult decision for you to go to Sheffield University? I mean, nobody in your family had gone to college before.

WADSWORTH: Well, that's right, but I think that was true of a lot of people of my era. The baby boom generation in England certainly had a lot of examples of first-time college entrants. There were many people who were [the first in their family] to go to college. So, it wasn't intimidating in that respect. Sheffield was well known for metallurgy. And, I also had a friend there, and I stayed at his house. His mother and father put me up when I was at boarding school occasionally. So, I felt somewhat comfortable at Sheffield. And so, I was ready to move on. But, as I say, it was touch and go at various points.

STOW: Let's move ahead several years. You graduated with a Ph.D. degree and went into science at that point. What were your aspirations? Did you look down the road ten, twenty, thirty years and figure out where you might want to be in the field of science?

WADSWORTH: Absolutely not, and I never have done that. I have been a firm believer that you work as hard as you can and you enjoy your work. I believe that when you wake up in the morning, you should want to go to work. And our generation has been given the gift of being able to change jobs, whereas my father's and my grandfathers' generations didn't. They couldn't change jobs, but we can. So, the philosophy of being able to do something you want, which is really a gift, was the first thing that I worked on. The second is just to work very hard, which came naturally to me. So, the answer is that I didn't think ahead or didn't plan. Now, when I was doing that Ph.D., it seemed like all the interesting, cutting-edge work was being done in the United States. So again, like many of my generation at that time, I wanted to come to the States, because that was where the action was. In fact, there was a "brain drain" from England, which started in the early 1960s. And, it was called the "brain drain," but I'm not sure I was part of the "brain drain." But I was part of the drain, anyway, because I left in 1976. So, I planned [ahead a little] I came to do a one-year postdoc at Stanford [University in Palo Alto, California] and just never left. Although, I hasten to assure you, I'm legal.

STOW: (laughs) It never crossed my mind.

WADSWORTH: (laughs) I became a permanent resident. Just put that on the record. So, I went through all this visa thing. I came on something called the J-visa, which was difficult to transfer. And eventually, I became a permanent resident. And then, I became a U.S. citizen, and I was very proud and anxious to do that in 1984. And so, no, my aspiration at that time was to come and do one year of research at a great university, which I had read a lot about and where I [could do] very interesting research in an area I was interested in. So, that was why I came. I ended up staying there four years. But no, I didn't plan ahead.

STOW: At some point in your early career, you transitioned from a scientist to a manager. I mean, you never lost the scientist aura, to say the least. Was that a difficult decision for you when you went into management -- because you love your science, I know that, and still have your fingers in the "science pool?"

WADSWORTH: Yes, it's true. I dabble now. It's very hard to do in the recent jobs I've had, but I do still occasionally publish a paper [or give a talk]. Let's see, when I started at Stanford, all I wanted to do was research. And then, I joined Lockheed Missiles and Space Company at their research lab in Palo Alto, which is actually on Stanford-leased land. So, it still has very much of a research environment. For the first five years there, I pretty much did research and I had a small research group. I think, like many people, my first step into management, quite frankly, was more of a defensive move than it was a desire to go into management. "Hey, we want you to be manager of this group. And if you don't agree, then we're going to bring somebody in nobody knows, or somebody we did know who we didn't want in the job." And, it was really more motivated by that than any intrinsic desire to manage. Now, once you've managed 50 people, and have somebody above you who is managing 200 or 300, then, at some point, you want that job, because you think you can make better decisions than whoever is going to come in, so you end up in this "escalator" upper-management chain, if you're fortunate enough to be picked. And so, that's really what happened. I moved up in Lockheed and then joined DOE's Lawrence Livermore National Lab.

STOW: Speaking of wanting bigger jobs, let's jump to ORNL. What was it that brought you here in 2003? You knew of ORNL. You had been here before, I think, on visits. But what attracted you so much to this particular position?

WADSWORTH: You're right. I had been here before several times and given talks here. And, my colleague C.T. Liu had invited me on a couple of occasions. Back in England when I was doing my thesis, I had read about several national labs in the U.S., including Livermore, Sandia, and Oak Ridge. So, I had this mental image of these labs and wondered what it was like to be there. Two or three labs were always in the back of my mind. Oak Ridge was famous for its materials science, and that, of course, was my field, so there was always an attraction in that regard. Now, in the early 2000s, there was a fork in the road in my career. Bill Madia had been talking to me about joining Battelle on several different occasions. We got to know each other over the years, and he indicated that at some point, Oak Ridge National Laboratory would be looking for a new director [to replace him] when he moved to Battelle. So, I actually joined Battelle for a year and then came to Oak Ridge when he left. I was fortunate to be given his position. A lot of factors obviously affected how these things come about, but I was tremendously honored to be appointed the director of this laboratory and grabbed it very quickly when it was offered.

STOW: We're glad you did. Now, UT-Battelle took over management of the Laboratory in 2000.

WADWORTH: Yes.

STOW: You came in 2003. There had been an awful lot of progress and modernization of the Lab during the first three years of UT-Battelle's management tenure. When you came in 2003, what was the greatest challenge that you were faced with at that point?

WADSWORTH: Well, I don't know if there was a single challenge. So many things were happening that they had to be handled in parallel. I think, in some sense, the challenge was to [manage multiple processes]. But certainly, the Spallation Neutron Source was on everyone's mind, because the Department of Energy was really relying on us to deliver that on cost, scope, and schedule, because of the fact that it had been very hard to [get] other big projects done in that manner. So, the Spallation Neutron Source was a big challenge. Starting the race to [achieve] really large-scale computing was something that happened shortly after I arrived. I worked a lot with Thomas Zacharia [associate director for computing and computational sciences at ORNL] on thinking about how to do that, although he certainly had all the good ideas. So, that was a major challenge. The third one was biology. As you know, we had been a tour de force in the 1970s, and we, along with DOE, were looking at where biology was going. I was very interested in that part of the Lab, because I had helped create the Joint Genome Institute when I was the director at Livermore. I was aware of all the very good work Oak Ridge had done in the Human Genome Project. A [fourth challenge] was the continuation of the modernization of the Lab, which was a big deal. We had to make decisions about how much debt we were going to take on and how much more we were going to do in terms of third-party financing of new buildings. There [were also challenges in sustaining] the materials work and physics research at the Lab. There was the need to ensure [the scientific world that] we didn't just build user facilities for the rest of the country and the world, but that we also built powerful [research] programs of our own. There were changes in the political scene. There was a need to really engage in the community. And then, there were the continuing operational issues around safety and cleanup of the central campus. Oak Ridge is a very complex laboratory with a lot of ambition and a lot of legacy issues. So, there was a very full plate that still [exists today].

STOW: And, correct me if I am wrong here, but we had an aging workforce too, didn't we? So, we really needed to lower that average age [by recruiting bright, young researchers].

WADSWORTH: Yes, sure. I have to mention the nanoscience center, as well [called the DOE Center for Nanophase Materials Sciences]. We won DOE funding and had to build that. Yes, the human resource factor continues to be one of the major challenges. As this baby boom bubble moves through the workforce, and I am part of it, there are a lot of us around. And, now a lot of us will be retiring in the next five to ten years. So, the recruiting challenge is not only to replace the people who are going to retire, but also to replace them at a time when the number of people available [and qualified to be hired] is going down. Two groups of people are available: The U.S. trained people, and the number of them is going down, and the foreign nationals, like myself, who come to this country and remain, but that number is going down. So, you've got an increased need, and you've got two source terms that are each diminishing. That's the heart of the problem, and that means that we are all going to be competing for the same reduced number of [qualified] people. I think that is a major challenge for all of us in this country in the next five to ten years.

STOW: Is it possible, as you look across the breadth of talent here at ORNL, to put your finger on what ORNL's greatest areas of strength are?

WADSWORTH: Well, I can't [address] the many strata of the Lab. I can only talk to the piece that I was intimately involved in. I think there is a degree of collegiality at the Laboratory that [differentiates Oak Ridge from other laboratories].

STOW: Is that right?

WADSWORTH: Yes, I believe there is. Certainly, the leadership team I inherited was first rate. And, you do get first-rate people all over the Lab's systems. But for some reason, this particular team seems to be able to participate in vigorous debate but then follow a unified direction. I think that, at the end of [the] day, that's the real "trick" to success. You're able to have quite passionate debates, yet, at the end of each

debate, the members of the leadership team all line up, even though some had a decision go in the direction they didn't vote for. And, we've got some specific examples of this. But, I was always impressed by the way this laboratory could marshal behind a decision once it had been made. At other labs where I have been, that was not always the case. The people who did not get the decision they wanted would work to undermine the new direction, or they would continue to debate it endlessly. So, that was something that I noticed was different here.

STOW: Well, from my perspective, that was instilled in the staff here when UT-Battelle came in. That was one of Bill Madia's directives, really. He said we can debate an issue, but once we reach a decision, then everybody [must be] on board.

WADSWORTH: Yes. Andy Grove, the Intel CEO, wrote the book *Only the Paranoid Survive*. He said this also. He came up with a quote that I've used a lot, which has to do with this vigorous debate. He talks about companies that are in crisis or not in crisis, and he talks about the need to have an open discussion but then to get aligned. I think that is a basic management paradigm that differentiates [successful companies and laboratories from their competitors].

STOW: Let me switch gears just a little bit here. When you came in 2003, a lot had been done to renovate and revitalize the Laboratory, but a lot more has been done since you've been here over the past four years. Looking back over the past four years, what are you most proud of that has been accomplished?

WADSWORTH: Well, certainly, in terms of facilities, the SNS came in on cost, scope, and schedule.

STOW: Very much so.

WADSWORTH: On that April day, in 2004, we had 100,000 control points all work, and Thom Mason and his team are to be congratulated. The nanoscience center was completed and Linda [Horton] did a terrific job in helping us do that. With our new supercomputer, we're heading off to a petaflop (thousand trillion arithmetic calculations per second) from really nothing. When we started, we had an old computer and an old computer floor, and we took a business risk and built one acre of world-class computer space. And, [Thomas] Zacharia took that charge and we're heading off to 250 teraflops in a couple of months, and a petaflop next year, and success begets success. Other people want to come and put their petaflop computers here. We've got a proposal in for 20 petaflops. And years from now, when people look at this interview, maybe they'll giggle at petaflops, saying that it's no longer that big of a deal. They'll be talking about exaflops, which is the next 1000-fold increase. But for us, the era of getting to a petaflop was a tremendous one. As for biology, we await the decision on the Bioenergy Sciences Center [which ORNL won]. We are very confident. We put [in] a terrific proposal and we got tremendous help from the state and the University [of Tennessee]. So, I'm very proud of [the people who came] through, and Oak Ridge has developed a reputation for being a winner in nationwide and worldwide competition. At the same time, we have continued to publish. The people who are [in] very small research teams have continued to flourish. It's not all about big science. We set a world record in microscopy at 0.6 Angstroms resolution; that's a $3- or $4-million area, not a billion-and-a-half area of research. So, in our modernization efforts we built [a number of buildings, including] the Multipurpose Research Facility [for national security work]. So, we went to $120 million in debt. This was a good thing to do, but most contractors don't do it at national labs. It is, however, how U.S. business works. You're taking other people's money and putting it to work and giving yourself a competitive advantage. That takes nerve and, collectively, the leadership team made those decisions and the risks have paid off. Our National Security Program has grown tenfold. When I came, the program had $40 or $50 million, and we may close the books this year at $400 million. We converted all the money we had for construction into the operating budget, so the Laboratory is now [operating on] a billion [dollars] of real money. And, I think it was $500 million when UT-Battelle took over. I think our operations have been fantastic. You know, we've reduced the number of nonreactor

nuclear facilities from 10 to 3. I am very proud this week to be able to tell the world that HFIR [High Flux Isotope Reactor] ran with full power for a full cycle with a world-class cold source, [slowing] neutrons down to liquid hydrogen temperatures and opening up new fields of science. That's been a huge lift. Kelly Beierschmitt and his team have done a fantastic job [on the HFIR upgrade]. Human Resources under Lori Barreras has really started to change. We are doing a lot more exciting things in HR. I see so many good things happening, and they needed to happen. Otherwise, this laboratory would have struggled. I have to say, we do nothing on our own. It's all done in partnerships.

STOW: Yes.

WADSWORTH: Whether it's the Tennessee Valley Authority, the University of Tennessee, DOE, other laboratories, or universities, generally, nearly everything we do is in partnerships. So, that's another characteristic of this lab, a great willingness to partner. And, I have to say, of course, our elected officials are probably the strongest group of elected officials in the country, New Mexico not withstanding. And, they have been extremely gracious to me and very welcoming. I should mention U.S. Senators Bill Frist, Lamar Alexander, and Bob Corker [who replaced Frist]; U.S. Representatives Zach Wamp, Lincoln Davis, and Jimmy Duncan; and Governor Phil Bredesen [of Tennessee]. This is a tremendous asset for this laboratory to have politicians who are that talented, that hardworking, and that committed to the success of the Oak Ridge National Laboratory.

STOW: Well, I was going to ask you about the support that you have gotten from your elected officials.

WADSWORTH: It's unbelievable. The third week I was here Senator Frist called me and asked if I would be able or willing to meet him on Saturday and show him around the Lab. Again, it didn't take long for me to understand the right answer to that question.

STOW: I understand.

WADSWORTH: Yes, sir! And, he came out sure enough -- a wonderfully gracious man -- and toured the Laboratory with me and did a press conference with me. And when he was asked a question about Iraq, he turned to me and said, "Do you want to handle that one?" But, I was already a few feet away at that point.

STOW: (laughs) Conveniently.

WADSWORTH: Conveniently. Lamar Alexander has also been very, very helpful. So, we have really been blessed with support in that respect. We've been careful to use it the right way. Our goal has always been to urge that science be supported in this country. And, if the science support is there, we will then go out and fiercely compete for it. We've tried very hard not to ask for Oak Ridge favors, because we believe we are strong enough to compete on an equal footing, or better. But we need that legislation passed to increase the investment in science and technology in the nation, because that is so critical to our economic future. So, we've advocated Lamar [Alexander] as being a real leader in legislation in science, technology, and education.

STOW: I hit a gold mine with that question. I asked you what you're most proud of, and you've covered the waterfront. But, that's great, because you ought to be proud of all that. Is it a fair question to ask you what might be a disappointment that didn't develop as well as you wanted it over the past four years?

WADSWORTH: Yes, sure. It's a fair question. It's a good question. One area that we've been disappointed [in] is the central campus. We sit here in the east campus, which is revolutionized. It looks like a twenty-first century university, really. We wanted the feel of that, because we're recruiting and

competing with modern campuses and modern laboratories for [talented researchers]. So, as you drive up to the [east campus of] Oak Ridge Lab, you have the feel of entering a twenty-first century national laboratory. The west campus where the biology and environmental work is being done under Reinhold Mann [then associate director for biological and environmental sciences] has started to look [modern, like the east campus]. We've built the Joint Institute for Biological Sciences there [which later housed the Bioenergy Sciences Center]. Of course, up on Chestnut Ridge, we have the new SNS, the Center for Nanophase Materials Sciences, and JINS [Joint Institute for Neutron Sciences]. That also is a well-operated, energy-efficient, twenty-first century complex. The central campus is a [disappointment because we've not been] sufficiently persuasive to get a more rapid start on what in the end is about a billion-dollar cleanup legacy from the Manhattan Project [and from the Lab operations] in the 1950s and 1960s. We've made a small start with the Oak Ridge Science and Technology Park [for commercial technology firms] at the north end, which is uncontaminated. The next revolution, in a sense, is that companies want to come in and build their buildings with their money on our land, so they can access our researchers [and have the benefit of increased security]. But, the remainder of the central campus requires a big, expensive cleanup. That's a problem because the Secretary of Energy has to decide where that billion dollars goes. Does it go into science? Does it go into Hanford's cleanup? Does it go into other projects? So, we understand the difficulty, and he and I have debated that quite extensively, as a matter of fact. I understand the difficulties of making those tradeoffs. Nonetheless, that's something that remains a problem and will be for some time. I wish Building 3019 had been emptied of the [radioactive uranium-233] material in there, so that's part of the central campus cleanup, of course. But, that would be the major facility area. Other than that, I think we are well positioned to meet the other goals I mentioned.

STOW: Good. It is obvious that ORNL has come light years over the past couple of years. As far as progress goes, we are riding the crest of the wave right now. Is there any single event that could really undermine the progress and the success that we've experienced here?

WADSWORTH: Yes, there is. People here wonder why I am so passionate about safety. I didn't used to be, but, like many people in my kind of role, I had my epiphany on this, as it were. I am strongly of the belief that we have the responsibility for people to be safe at work, and, for that matter, at home. I believe that if [staff are] operating [on] one set of rules here and another at home, under pressure or a crisis, they will default to the lowest standard.

STOW: Yes.

WADSWORTH: It's human nature. So, I've spent a lot of time on safety. I think an accidental death at this laboratory would be the biggest single tragedy for that person and his or her family, but it would also be the single biggest problem for the Laboratory. We know this. We have the data. Directors at other laboratories who had very severe accidents under their watch have run the risk of having to close those laboratories, literally. So, I think that carelessness, in that sense, would be the single biggest worry that I would have, in that we have to ensure the safety of our employees. Now, you know, we're a small city of 4,200 + people, spread over a lot of acreage, so there is always the possibility you'll have somebody do something bad. That doesn't worry me so much in terms of somebody misbehaving in a criminal way. I mean, it's obviously not something we want. But, though that's a very rare event, I think we have very good processes in place for [to deal with misbehavior]. But, it's more human behavior than scientific misconduct. You can see what happens in South Korea when somebody becomes overly ambitious [in research on] human stem cell lines and gets carried away. The whole country now has a pall cast over it as a result of that [scientific misconduct]. So, I think that our philosophy of simultaneous excellence -- where we strive to be excellent, not only in science and technology [but also in operations, community outreach, and ethical behavior -- is a good one], because scientific misconduct would clearly have a big [negative] impact, for all the reasons I mentioned. We [emphasize] safety and [protection against] radiation to make sure we are very safe [when we run our] complicated, high-hazard operations. And, the

third [area of importance to us] is community outreach. We've spent a lot of time on community. I think that the community around East Tennessee knows more about this laboratory today than they ever did in the past, and that that transparency in the end is extremely important. First of all, it's the right thing to do [to help the community], and secondly, it's very important, because we have the community's support. So, another way to fail is to not have the support of the community. When something goes wrong, it maybe reinforces the [community's] fears that something strange is happening at that weird lab that's fenced in. And, then the community may support the Laboratory. Our community outreach has included holding open houses [and family days at the Lab, my spending lots of time in the community and explaining in talks] what happens at the Lab, and helping [push the modernization of] Oak Ridge High School. In all those [ways], we have embraced the community. And, in return they embrace us.

STOW: You've read my mind here, because my next question was to ask you about community support and its importance to the viability of the Laboratory.

WADSWORTH: It's extremely important. I spent a tremendous amount of time in the community. Whether it's giving talks, attending various community functions, helping the Methodist Medical Center hospital, [supporting and guiding the renovation of] the high school, or building the finishing tower for the Oak Ridge Rowing Club, we are interested in it. And, we spend a lot of time on that. Again I live in this community, so [ORNL's efforts to bolster the community] is both the right thing to do and a good business decision. The Oak Ridge High School is perhaps the clearest example of that. It's a bit like [our administration building], Building 4500. It was built in the early 1950s. The people in it are terrific, but the building needs redoing.

STOW: Yes.

WADSWORTH: And, in that case, we decided to do that shortly after I arrived. And, with Billy Stair [then director of Communications and External Relations], we plotted a course, and, essentially, we gave a million dollars, as did the parent company of Battelle. Carl Kohrt [the Battelle CEO] gave a million. Ron Townsend, who's a terrific asset to this community and runs ORAU [Oak Ridge Associated Universities], gave a million. That $3 million was leveraged again and again. There was a referendum in Oak Ridge to increase the sales tax with a pointed purpose of helping the high school. That [half-cent] sales tax increase passed. It was the only sales tax increase that year in the State of Tennessee to be passed. That was leveraged with State QSAB bonds. I still don't know what those are, but it was a good thing. And, then [with the additional support from] private giving by individuals and families, some $56 million was raised. Now, that's good. That means it's good for the Oak Ridge High School, a terrific high school with very good teachers of science and technology.

STOW: It always has been.

WADSWORTH: It always has had that, and it's no surprise, given the population here. The fact is that people come here -- and we're recruiting them -- to do exciting work. That's what attracts them, but, quite honestly, the second question we've often had is, "What's the high school like?" And, it's not [a question that comes] just from people who have kids in high school. People want to join communities that care about education. Even people who don't have kids, or whose kids, like mine, have graduated from high school and college, still ask about the high school.

STOW: It's a measure of the vitality of the community.

WADSWORTH: Yes, it is. It's a measure of the quality and the vitality and the nature of the community.

STOW: Since you have been here for the last four years, you have interacted considerably with the research staff. It is my impression that they have responded very positively to you. Any idea why that is?

WADSWORTH: Well, I think they have. I'll put a caveat up front. I think that some of them have worried that I've spent too much time on the big facilities. And, I've discussed that with them. The fact is that one of the things a laboratory director has to do is to make sure that the big investments are being done appropriately and being described to the public appropriately. And, it's almost inevitable that my speeches or talks are biased in that direction. However, I think that the fact I have published a great deal myself – and been fortunate enough to be recognized and sought in the scientific community – has certainly helped. I think that the scientific staff members recognize and respect a fellow researcher, even one who's buried under a lot of management layers.

STOW: I think you've got around 275 open-literature publications.

WADSWORTH: Yes, something like that.

STOW: That's something to be pretty proud of.

WADSWORTH: I think [my publication record] has certainly helped. But, I have to say, I feel fully engaged with everyone at this laboratory. One of the interesting things I did on safety that really paid off was to give [a couple dozen] lectures on safety. I wanted to talk to everyone at the Laboratory, and so I gave 26 presentations to audiences of about 200, 300 or 150 employees over the course of several months. I really wrote my own lecture. I got interested in safety and tried to make it not only interesting but also to try and explain the importance of it. And, I think, a lot of that helped as well, because, when I walk around the campus here, I get friendly waves. And, the union guys were really funny, because they took me at my word to be willing to be challenged [and to bring safety problems to the attention of other employees]. So, when I had a tail light out on my car, a couple of them stopped me and pointed that out. So, that afternoon I went and got it fixed. And then another day, they pointed to a tire that had a scuff or a mark on it and I [responded the same way]. So, I think my engagement with the entire staff, not just the research staff, is something I am very proud of.

STOW: Good. You've got various philosophies that you go by. For instance, there are other people out there who are smarter than I am. Use them. Can you think of an example or two where you've used somebody who's very smart out there to benefit ORNL over the last couple of years?

WADSWORTH: Oh, goodness me, many! Lots of people -- most of the people on the leadership team to start with -- a bunch of new corporate fellows and our old corporate fellows, for that matter. Yes, absolutely. The best thing I think somebody in my kind of role can do is to hire and encourage people who are better and smarter than I am and to position them for the future. I always look for that in our leaders. Are our leaders willing to go out and hire people who could be better at that job than the person in the job? We should be. We should all be doing that, fearlessly. I see a lot of evidence that people are going out right now and hiring the very best. One of the things that will be needed as we move ahead is that capacity, because with all of the tools that we have, the facilities, the competitive nature of the international scene we're moving into, as well as the recruiting challenges, we're going to have to have the very best people. I think that's probably the number one mission for the next lab director: To inculcate that value into all of the hiring that we do and to try to hire [the brightest people], just as we're unafraid now to say we are the best in the world. And, Ray Orbach, who runs the DOE Office of Science and is also now the Under Secretary for Science, made this very clear to us. That was a management credo that I hadn't quite got when I joined the Lab. But, I got it pretty fast once we had a couple of reviews with him. He was fearless in insisting that, as we invest large amounts of money, whether it's in computing or neutrons or materials or biology, we have to come up with proposals that make us nationally ten times

better than the best in the world. To spend a billion-and-a-half dollars and go to him and say, "We're as good as the French," doesn't work. You've got to be 10 times better than whoever is currently leading, whether it's Japan or some other country. So, we became fearless in thinking that way -- and by the same notion -- we've now got to go and hire Nobel Prize winners or future Nobel Prize winners and bring them into this laboratory or collaborate with them in some way, in order to continue to increase the scientific excellence of this laboratory.

STOW: I had a question you've touched on a little bit but, I'll still throw it out at you. Are there any key philosophies that you operate by that help make change happen? Change has really gone on here at the Laboratory over the last many years -- and with the exception of hiring very smart people -- do you have other insights?

WADSWORTH: Yes, I do. When you hire very, very smart people, the next thing you have to do is delegate to them. Most scientists and engineers have a very difficult time delegating. It's because they feel a very deep responsibility to the end product. They want to stay with it, marshal it, and make sure it's done to the exacting standards they apply to their work. And that's a very natural trait. As you move to increasing management responsibilities, you must learn to delegate. So, with that limit, you don't have a job in a funny sort of way. If you surround yourself with people who are better than you are -- and you delegate to them -- that's the ultimate solution. So, I have learned to delegate. When I say Thom Mason built the SNS, Thom Mason built the SNS. I didn't build it, but I talked with him about it. Had he been doing something that I thought was odd, I would certainly have discussed it with him. When I say Thomas Zacharia built the petaflop computer, he did it. We certainly would discuss things, but you have to delegate to people. Reinhold Mann is building the Joint Institute for Biological Sciences [Bioenergy Sciences Center]. We had a vigorous debate about it. Alignment and delegation -- once you've got that done -- you have to let people go and do it. Vigorous debate, alignment, and then delegation.

STOW: Let me switch directions just a little bit here. Alvin Weinber was the longest tenured director of the Laboratory, from 1955 to 1973. During his time at the Lab, he made tremendous contributions. Do you see the signature of Alvin Weinberg in ORNL today?

WADSWORTH: Yes, very much so. I had the privilege and honor of both meeting him and knowing him. He once showed up at a couple of lectures I gave and I was astonished to have him there. I felt very privileged that he showed up. His signature is on everything we do. I think he was really a pioneer in understanding that big labs do big things [e.g., research projects] and have bold visions, and his management wisdom is very prevalent. In fact, I'm giving a lecture on how he influenced national labs in a couple of weeks at the ORICL (Oak Ridge Institute for Continued Learning] series.

STOW: Oh, yes?

WADSWORTH: I'm enjoying once again revisiting some of his teachings. So, Alvin was a giant. He set the course of this country on nuclear energy. I think his big regret was that [commitment to building new nuclear power plants in the U.S.] had been dropped. We're about to embark upon it again, I believe. I think a lot of what we'll see in the world's [nuclear power future] will reflect Alvin's philosophy.

STOW: I've never come across a man who had more foresight and ability to predict ten, twenty, thirty years into the future what the needs will be.

WADSWORTH: Yes, absolutely. He was a great visionary. He was a great social thinker. He was able to transfer his science and technology background to economics and sociology and the well-being of the world -- a great man.

STOW: Very much so. We have a sister organization over in Bear Creek Valley – Y-12. What's our relationship been with Y-12 in your tenure here? Has it improved? Has it stayed about the same?

WADSWORTH: I think it's improved. Certainly, when I arrived, there were some concerns about the relationship because we were recruiting quite heavily. Y-12 was not growing. People were leaving Y-12 and, in some cases, were joining us.

STOW: Yes.

WADSWORTH: But, that's a natural occurrence. I think we've been a lot more thoughtful in the recent past about teaming with them. George Dials is now the manager of Y-12, and we have a number of joint programs with them. I went over there in the first few days I was here. And, I had a good relationship with all the leaders there, from then to the present time. Certainly, we do collaborative work with them now. Y-12 is another billion- program in the valley.

STOW: Very much so.

WADSWORTH: And, they do tremendously important work in national security in the weapons complex. They're also now modernizing that facility. As you drive by it, it's unrecognizable. They've got a beautiful new building out front.

STOW: A wonderful visitor's center.

WADSWORTH: Yes – a wonderful visitor's center – and I think they're a very important part of the Nuclear Weapons Program. They have a different mission from ours. By nature it's more secretive. There are more guards, guns, and gates than we have, so it's a little harder for them to embrace the community in the way we do and have people come in. So, we need to support them in those endeavors. They teamed with us on the high school and other endeavors.

STOW: I'm always struck by the confusion that exists out there in the public, not only locally but nationally and internationally on the differences between ORNL and Y-12. ORNL, as we know it, is a very distinct entity – distinguished from Y-12 and what used to be K-25 – but the public sees Oak Ridge as just a mishmash of different programs. Is that a problem that you have come across as you go out and talk to the public, that there is lack of understanding of the distinctions among the different facilities?

WADSWORTH: I think there is some confusion. I think that is one reason why it is in our best interest to have everything be successful. By the way, but I'm not a driver for it. I think on the whole that people understand that there is a difference between the Lab and Y-12. People who live farther away don't necessarily know the distinctions -- and I'm not sure that that's something they should know. Our responsibility is to continue to be open with the public. For many decades, when [members of the public drove] past X-10, Y-12, and K-25, they saw barbed-wire fences and guards. It's natural to think of the three plants as an entity as opposed to differentiating among them , so I haven't found this to be a problem. For example, people on the whole don't think that we at ORNL build or design nuclear weapons. I think they understand that Y-12 is [less] diverse than we are. And, that's probably an important distinction. We have researchers from 80 different countries here, for example. That [kind of diversity] is probably not an aspiration Y-12 would have.

STOW: Let me wind up with a final question related to ORNL. Then, we will move a little bit to you. If ORNL did not exist today – given its uniqueness and everything else as well – do you think it would be necessary to invent an entity like ORNL in order to address social, economic, and scientific problems?

WADSWORTH: In the literal sense you ask the question, yes. I think this country needs to have [a] world leadership position in nanoscience, which we have through the SNS, microscopy, and the nanoscience center. This country needs world leadership in computing, which we have. And, we need world leadership in bioenergy and other energy programs. And so, I would invent it. Because we lead in many of those fields, and the country needs to be leading the world in those fields, we can talk about [our country's position in the] international science arena. It is very important to have that leadership in the United States to stay ahead. So, my short and long answer is yes.

STOW: As you know better than I, science advances very rapidly in the field of computing. We may be number one today, but tomorrow, perhaps we're not. What does ORNL need to do to stay ahead of the power curve here over the next several years?

WADSWORTH: Well, what we've done is take business risks.

STOW: Yes.

WADSWORTH: So, when you say you can build a Spallation Neutron Source on cost, scope, and schedule, and no one has done it before, and you're going to do it for $1.4 billion, and when you say you're going to build a nanoscience center and supercomputer and bioenergy programs, then you have to deliver. So, the first thing you have to do is take business risks, and that's what they are. We have taken risks with [our] reputation, money, and resources, and now we have to deliver. If you take business risks and you deliver, then people [willing to invest in] other large projects are more likely to come to you.

STOW: Success will follow…

WADSWORTH: Success breeds success in this regard. So, consider the United States investment of $1.12 billion in ITER, the world fusion program based in Cadarache, France. That $1.12 billion was transferred to the Oak Ridge National Laboratory as a responsibility just last year (2006). The [transfer of responsibility for managing that large investment] was done was because of our success on the Spallation Neutron Source. Entities want to bring their petaflop supercomputers here because of our success in building the supercomputer program and the infrastructure that goes with it, and our ability to articulate the difficulty of doing this from scratch. So, I think taking business risks and then making sure you deliver on what you promise will ensure future programs coming. I can't quite resist giving you my one concern in this regard -- and I'll do it hopefully humorously. The one thing I don't like is the NFL draft, you know, the conventional professional football league draft in the U.S. That system says, "We're going to take the worst team and put your best player there." I don't like that. I like dynasties. I'm all for success on top of success. I don't think I see evidence of this [NFL approach]. But the notion that some big project wouldn't come to Oak Ridge, because we are being successful in various things, and, therefore, somebody else should get the next one, is a concern because parity is not the name of the game. The name of the game is leadership and continuing to build on success.

STOW: That leads me directly into my next question. There are multiple DOE laboratories around the country. There is some duplication, and there is certainly competition. Can the U.S. government continue to support this diversity of national laboratories in the next decade or two, do you think?

WADSWORTH: Well, the laboratories do have different strategic directions, and there is some overlap. Plurality is, in some sense, good in science. It's good to have different groups working in the same areas, because they will approach problems in different ways. So, the overlaps on the margin, in fact, I think we should encourage. But you can't have five SNS facilities.

STOW: True.

WADSWORTH: And, you shouldn't have five computer centers that all want to be world leading – other than for the purpose of competing to make sure you are. So, in that sense, I think the laboratories that will have the hardest time are the single-purpose laboratories, because when that single-purpose physics machine has delivered its research, then reinventing from a single-purpose lab is more difficult. If you are a multipurpose lab like we are, then you're really helping to solve the country's major mission area problems. And those are [improvements in] national security and in energy and environment, principally, with some materials and biology research thrown in when they engage these two missions. So, in my mind, those big mission areas – those big national leads – are constant. There is always going to be a national security imperative, and there is always going to be an energy and environment one. However, when you double-click on those, they are quite different. When I was growing up, national security was about Cuba and the missile crisis, the Cold War arms races, and mutually assured destruction -- all those worries of the 1960s and 1970s. Nowadays, national security is all about counterterrorism, nonproliferation, and multiple small wars. The energy likewise shifts. So, a great laboratory has a foundation that is constantly vibrant in science, and it applies that vibrancy to solve the problems of our time.

STOW: I have learned a lot from you today. If I were to become director of the laboratory, which is, of course, not my objective …

WADSWORTH: (laughs) There was an opening for it recently.

STOW: (laughs) … I'd be better off for it because of our discussion. There was an opening recently – Thom Mason, whom you've mentioned, has been selected. Have you given Thom advice as to how he might best run the Laboratory and where he needs to put his attention, or are you going to let him learn that himself?

WADSWORTH: He and I have had a few discussions, of course, over time. I wouldn't really be presumptuous to say here's what you've got to do. Hopefully, he's seen what's worked. Well, I know he has seen what's worked.

STOW: He has been a part of it.

WADSWORTH: Yes, he's been a very big part of it, and he will adjust that to his own style. I think one of the things that he and I have certainly agreed upon with Ray Orbach is the need -- the pressing need -- to recruit the world's best scientists to Oak Ridge.

STOW: Okay.

WADSWORTH: The UT-Battelle era up until now has been about reinventing and growing facilities and modernizing and putting in place the tools for the future. I think Thom's era as director will [focus on delivering] the science that these advances made possible. The key attribute -- as always -- will be people. We need people to build, renovate, and modernize, and we need people now to do the science.

STOW: Thom is going to inherit a laboratory that is very healthy. He is also going to inherit a laboratory at a time when the federal government is going to change in some way or another. Do you have any insights on how the 2008 elections might impact ORNL – not knowing whether it is going to go Democratic or Republican?

WADSWORTH: To be honest, I don't think it matters.

STOW: Okay.

WADSWORTH: We in science have created sustainable programs that will move across different presidencies and different administrations. I think that's really what great labs should do. It should almost be neutral vis-à-vis who is in. Now obviously -- on the margin -- how [national labs approach the nation's] nuclear energy future under a Democratic versus a Republican administration will be different. Nonetheless, I think nearly everything we do is relevant to the needs of this country and to the present and the future. We are an asset that whoever is in power will want to use. So, I don't have a concern over that. I think there is constant change -- we went through changes -- we are always going through changes.

STOW: Speaking of politics, have you ever entertained the feasibility or possibility of going into politics in your career at some point?

WADSWORTH: No, I haven't.

STOW: No?

WADSWORTH: I don't think I've ever been voted in on anything. Maybe a committee here and there – or a board of directors approval vote -- but I think politics becomes more and more intriguing as you enter a lab director's role, because you intersect more and more with politicians. It's the nature of the job. In fact, it is a very important part of the job and it's a part of the job that, really, only the lab director should do, because the representatives usually want to be talking to the lab director. Not somebody else. So, it is an important part of the job, but the political world is a different world…

STOW: Not your cup of tea is what you're saying?

WADSWORTH: I don't think so. I'm intrigued by it.

STOW: You'd be good at it.

WADSWORTH: Maybe. I don't know. As a lab director, you have to compromise, and you have to make a lot of decisions that aren't black or white. There is a lot of gray. In politics, there's tremendous compromise and tremendous gray.

STOW: True.

WADSWORTH: And, I think that's something that's hard for us to sometimes grapple with.

STOW: What about academia? Do you have any interest in eventually going back to a university?

WADSWORTH: No, not really. As we sit here today, I'm 57. I'm about to go to Battelle, and I know I'm going to have to leave at 65, because Battelle has a rule about that for the officers of Battelle. So, right now my plan is to try to help Battelle for the remainder of those years. After that, who knows?

STOW: Okay, fine. Let me turn to you a little bit more. You have had a very distinguished, productive career and hopefully that will continue for several more years. Is there anybody out there who has really influenced your career? I know you mentioned Gordon Richardson earlier because he helped you learn to persevere and to understand some metallurgical concepts. Other than Dr. Richardson, does anybody come to mind?

WADSWORTH: Yes, the man I came here to work with as a postdoctoral scientist at Stanford University. He is Oleg Sherby.

STOW: Yes.

WADSWORTH: He is a famous professor, or he was at that time at Stanford. He's now retired. He was a tremendous influence on my life. He invited me to come to the States. We worked extremely well together. He taught me a lot of life lessons, as well as scientific lessons. He was a man of great integrity, great humor, and great generosity. And, I think I learned a great deal from him. Maybe more than anyone else, I would attribute any success I have had to him.

STOW: Okay. In looking through some of your presentations, you've generously noted people like Henry Fonda, Gregory Peck, and Monte Montgomery.

WADSWORTH: (laughs)

STOW: Do you get inspiration from their movies and other artistic works, and so on?

WADSWORTH: Mostly [those references] came through the leadership and management training I went through, mostly at Lockheed, to be honest with you. They were very good at putting us in world-class venues for teaching us management principles. We were at Santa Clara University and we even intersected with Hollywood to learn about how to respond to TV [news reporter] questions and stuff like that. Anyway, those kinds of influences really came from that. Although some of those movies, on the surface, appear to be just general entertainment, [they] are used heavily in management training.

STOW: They've got a message in there.

WADSWORTH: They've got a message in there about how to manage, and that's where some of those names came from. My father fought under General Montgomery, and he had an amusing management lesson in his memoirs. That's where that reference comes from.

STOW: What do you personally think your greatest strengths and assets are as a manager and a scientist?

WADSWORTH: I think I'm willing to collaborate, partner, and delegate and [let go of] things that I shouldn't hold onto.

STOW: Okay – and what among your personal traits needs development yet? In other words, where is your greatest weakness?

WADSWORTH: Probably listening [to what other people are saying].

STOW: Is that right?

WADSWORTH: We tend to, sometimes, not always listen. I tend not to always listen.

STOW: I find that surprising, but I'll take your word for it. Some 25, 30, 40, 50 years from now someone is probably going to be looking back at the history of Oak Ridge National Laboratory and will read about Jeff Wadsworth, who served as director for four years. How do you want to be remembered down the line by somebody looking back on the history of the Laboratory?

WADSWORTH: Well, I don't think it's because of me, but I think the era from 2000 to 2007 will be seen as a transformational era when the Laboratory could have gone into a gradual decline -- or could have been revolutionized and positioned for the future. I hope people will look back and say that was a critical era in the Lab's history, that a great team of people positioned the Laboratory for the future, and [that the risks they took] paid off.

STOW: Throughout the years, you've received lots of awards, honors, appointments, fellowships in the American Association for the Advancement of Science and other professional scientific societies. Does any single award or honor stand out as the most prestigious, the most remembered, if you will?

WADSWORTH: Well, it's always wonderful and always a surprise to get any honor. My election to the National Academy of Engineering is one that was very special to me. My mother and other members of my family were there with me in Washington when I received this honor.

STOW: That was just about a year ago, wasn't it?

WADSWORTH: Ttwo years ago. Another award was the honorary doctorate I got from Sheffield University. That's the highest honor they give. I also got an honorary doctorate from Lincoln Memorial University recently, and that was very touching. I've been blessed with two honorary professorships in China. So, I have been very fortunate, and every time it happens, I'm quite humbled by it, to be honest with you.

STOW: Toward the end of the month, you and your family are going to be heading up to Battelle in Columbus, Ohio. What are your feelings about that change?

WADSWORTH: It's tough to leave East Tennessee. My wife is from Campbell County.

STOW: I didn't know that.

WADSWORTH: Right next to us here, although she spent most of her life in California. Nonetheless, it's tough to leave. On the other hand, I am on the board of directors of UT-Battelle now. I'll be coming back. I'm not giving up that position.

STOW: Good.

WADSWORTH: It's like the Hotel California, where you can check out anytime you want but you can never leave.

STOW: (laughs) How does Jerre feel about the move?

WADSWORTH: Well, she has been wonderfully supportive. She is very willing to return to Columbus. We spent a year there [when I was at Battelle] before we came here, so we know a little bit about it. [Serving as the president and chief executive officer of Battelle Memorial Institute is] the next exciting era of what I view as a very fortunate career for me. As we sit here today, I think [Battelle is involved in the management of] seven national laboratories. That's the job I'm going to do now – try to figure those seven out.

STOW: I understand. So, you're going to be under more pressure than you have been here?

WADSWORTH: Probably.

STOW: What do you do to relax? Relieve that pressure?

WADSWORTH: Jerre and I walk our two Jack Russell terriers daily.

STOW: Badger and Katie, right?

WADSWORTH: Very good. Yes, Badger and Katie.

STOW: How are they going to take the move?

WADSWORTH: Well, they seem to own anywhere they go. They have instant ownership, so I'm sure they'll do fine. They don't like the interim period I've noticed. They'll be happy to get up to the new house, I think. That's my main relaxation. I cook.

STOW: Oh you do? Any particular specialty?

WADSWORTH: No – pretty much across the board. It's almost like legal relaxation. Somebody has to. You know, you have to eat, so you get to cook -- so I do it. It's metallurgy really. It's transformations, temperatures, and times.

STOW: I'm going to catch you with a final question here, which you don't have to answer, but the old adage is that anyone with a British accent automatically has 10 points added to their IQ. Any reaction to that?

WADSWORTH: (laughs) It would certainly explain the data. I think people are gracious and very kind about the fact that I'm from another country, originally. And, I think, many have been to England, came from England, or have family, relatives, or friends there. So, it's a nice icebreaker in many respects -- whether the accent smooths over a lot of things is something I haven't thought through.

STOW: No, it's a lovely accent. I've tried to mirror it myself. Anything I can do to add to my IQ I'll try. Any final things that we need to mention or cover?

WADSWORTH: I think we've covered a lot of ground. The obvious statement that I'd like to make is that this is a wonderful laboratory. I do believe that in many respects -- if it isn't already and parts of it are already -- the Laboratory, as a whole, should be the best laboratory in the world for what it does. And, it's been a great privilege for me to be part of it.

STOW: Well, we thank you for your efforts and wish you good luck in your new position at Battelle.

WADSWORTH: Thank you, Steve.

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