

9531

Smithsonian Videohistory Program

Manhattan Project

Session Five

Collection Division 2: Oak Ridge

Stanley Goldberg, Interviewer

March 3, 1987

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Black, Colleen

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January 26, 1988
Date

Colleen Black
Signature

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Bolling, Connie

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CC Bolling

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Larson, Jane

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December 15, 1987
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Jane W. Larson
Signature

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Livingston, Audrey

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Dec. 16, 1987
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Audrey B. Livingston
Signature

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Manhattan Project:
Session Five

Life in Oak Ridge, Tennessee

Interview with
Connie Bolling, Colleen Black, Audrey Livingston,
and Jane Larson

March 3, 1987
in Oak Ridge, Tennessee

by Stanley Goldberg
Interviewer

for the Smithsonian Institution Videohistory Program

NAME LIST

RU 9531

Manhattan Project: Session Five

Interviewees: Connie Bolling, Colleen Black,
Audrey Livingston and Jane Larson

Date: March 13, 1987

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[Begin Session Five]

[Begin VHS Tape 1 of 1]

[Begin U-Matic Tape 1 of 2]

GOLDBERG: Why don't we begin. Let me just say, you know, this is not a documentary, it's for archival use, so don't worry about making mistakes. It will be nothing fancy. You can just forget we're on film, and just have a conversation. Feel free to talk to each other; don't wait for me. You can question each other, you can tell me I'm wrong, and from time to time we'll have stuff to look at. Let's see. Well, why don't we begin.

People began coming to Oak Ridge in about 1943.

BOLLING: 1943, yes.

GOLDBERG: And you came early.

BOLLING: Very early.

00:23:34:00

GOLDBERG: Tell us a little bit about what it was like when you first came, and why you came.

BOLLING: Well, I was teaching in Virginia in 1943 at Coburn, Virginia, in the high school there, and we had heard that there was a place near Knoxville that had a factory that would produce something that would end World War II. So I decided that I'd like to see about it, so I resigned. I gave 'em a little bit of notice, about six weeks' notice, so they could get another teacher then I came on to Knoxville--it wasn't called Oak Ridge--and hired in in what is known as the Daylight Building there in Knoxville, and came on over to--they said to come to Clinton Engineer Works. They told me what number of the road to drive. It was 25W, I believe it was. And come to Clinton and turn left at Clinton and come on to--they didn't say Oak Ridge; they said Clinton Engineer Works. There wasn't any houses, no houses in Oak

Ridge, and the road was just two-lane. And they were building dormitories frantically, trying to get housing for the top officials, more or less, first. Of course, they had the Alexander Motor Inn, they call it now. The big wigs, they stayed there for the first few nights until they could get them maybe into a dormitory. No houses, but they still were trying to get the old farmers to move out of their houses. Some of them just put their foot down and didn't want to move.

00:25:40:00 [Goldberg displays an enlarged archival letter]
 GOLDBERG: In fact, I think I have here a blow-up of one of the letters that the farmers got. I'll show it to you, and then we'll put it on the camera.

BOLLING: Right.

00:25:58:00 [Close-up of letter]
 GOLDBERG: This was dated November 11, 1942, and it says, "The War Department intends to take possession of your farm December 1, 1942. It will be necessary for you to move not later than that date." And I guess that was the first indication that these people had that they had to move out. Then it goes on to talk about how they might get their money quickly, whatever money they were getting. I guess it was rather shocking to people.

LARSON: It was a shock.

BOLLING: Some did, but some didn't. They still had their heels down, and they had to be moved out.

GOLDBERG: Did you talk to some of these people then? Did you know them then?

BOLLING: I didn't know them then, but I interviewed, in writing this book that--you had a book there. In writing this

book, I had a part in that. I interviewed these old settlers that had been moved out of there. Some were in their eighties, some were in their nineties, and they were still crying about it.

BLACK: A lot of them wanted to do something for the war effort. They knew it was for the war effort, they were very patriotic, and they wanted to.

BOLLING: Some.

BLACK: They just had to find a place to go.

BOLLING: Right.

BLACK: And they were given \$45 an acre, which is not much money, and for a home place, regardless of the size of the house, they were given \$45 an acre, whatever was on the land. Some of them brought suits against the government, and they won.

LARSON: Some of those farms were just lovely places, too. They built the houses in the town site around a lot of these farms, and so we would go when we were having a day off. We couldn't use the car because of rationing, and there was no gasoline, but we would all go and explore those farms. I remember always, they all had daffodils and lilacs growing by the front door, and they were really nice places.

BLACK: They were. And the good thing about it, okay, they moved the people off, but they promised them a job, say, if they moved down to Oliver Springs or Marlow, wherever they moved, they could come back as firemen, laborers, and they did come back.

00:28:08:00 [Goldberg displays copy of These Are Our Voices]
 GOLDBERG: While we're at it, let me mention this book. This is the book that Connie Bolling was referring to, which was recently published here in Oak Ridge, called These Are Our Voices¹, edited by James Overholt, and available--at least the one place I know it's available is the Oak Ridge Children's Museum, but I think it's being generally distributed in the area.

BLACK: It's in the Knoxville bookstores.

GOLDBERG: And it's a very nice piece of work in which people who lived here--either they had been here before or they came for the effort--just put down their remembrances, including Connie Bolling and Jane Larson.

Well, let's take a look at some of the things you've been talking about. When you say the town site, I think I can get it out here. Is that the place?

00:29:05:00 [Goldberg presents an enlarged aerial photo of mid-town Oakridge]

LIVINGSTON: Oh, my goodness.

BLACK: That's mid-town. That's mid-town, where the present downtown is.

LIVINGSTON: That's the trailer village down there.

BOLLING: Those were very temporary, and they were just trailers, I believe.

BLACK: Trailers, but it also had a barbershop and a beauty shop and a supermarket.

¹Jim Overholt, (ed.) These Are Our Voices: The Story of Oak Ridge; 1942-1970 (Oakridge: The Children's Museum of Oakridge, 1987)

00:29:28:00 [Close-up of aerial photo]

BOLLING: And they took pains, though, to build theaters. I believe they had a theater in that area, maybe. They wanted to give entertainment, places of entertainment to these people because they might not hold 'em. They might go back home if they didn't have some recreation.

GOLDBERG: Did a lot of people come and not stay very long and then leave?

LARSON: They could if they wanted. If they didn't like Oak Ridge and couldn't adjust, they were free to go, which I think is perhaps not clearly understood today. But the effort always was to make it really pleasant, you know, a challenge, even though it was muddy and we were pioneers. Still, we had the challenge of helping with the war and making quite a contribution.

GOLDBERG: This is the town site.

BOLLING: No, no, no.

BLACK: That's a trailer.

LARSON: Trailer Valley. Happy Valley or something like that.

BLACK: It doesn't look like Happy Valley, but it could be.

LARSON: They had different kinds.

GOLDBERG: Who lived in these?

BOLLING: I believe laborers, possibly.

BLACK: Construction workers.

BOLLING: Construction workers.

LIVINGSTON: That's right.

BLACK: Operators.

LARSON: Guards.

LIVINGSTON: They're the ones that used to be right across from downtown?

BOLLING: No.

00:30:48:00 [Close-up of photo of house trailers]

LARSON: I think they were demountables. Weren't there a lot of demountables?

LIVINGSTON: There was a huge trailer village there.

LARSON: Then the trailer village, too. They just brought in all kinds of housing.

BOLLING: That's flattops.

BLACK: Huts and flattops. Hutments.

GOLDBERG: Hutments?

BLACK: Hutments.

GOLDBERG: What's a hutment?

BLACK: Well, a hutment was--sometimes they were used on construction site, and they had four men in there and a stove in the middle. And in the summertime, they took the stove out, and you could get five men in there. You could live for \$5 a month, I think.

GOLDBERG: Five people lived in one of these little things?

BLACK: Yes.

00:31:22:00 [Close-up of hutments in photo]

LARSON: It was sort of a wooden tent.

LIVINGSTON: The things that. . .

BLACK: A wooden tent describes it very well. No bathrooms.

LIVINGSTON: The soldiers lived in it, didn't they?

BLACK: Well, they did later, but they lived all together. The soldiers lived all together in one spot where downtown is.

GOLDBERG: Would this be. . .

BLACK: That's the stove, and that's the inside.

GOLDBERG: That's the inside of a hutment.

BOLLING: That's the inside.

00:31:42:00 [Close-up of photo of a hutment interior]

GOLDBERG: Well, let's put that up here.

LARSON: Now, a demountable was another step up. Essentially, there was air underneath your floor, and it was on pilings. But then it looked sort of like a tent from there on up.

00:31:58:00 [Goldberg indicates the stove in the photo]
GOLDBERG: That stove, is that a wood stove or a coal stove?

BOLLING: Coal.

GOLDBERG: Coal stove.

LARSON: Soft coal, too.

BOLLING: The whole valley was filled with smoke.

LARSON: Sure was.

LIVINGSTON: Your whitewash was not white; it was polka-dotted.

LARSON: You could not dust or clean house too well.

GOLDBERG: Let me try this one. Is this town site?

LARSON: No. [Laughter] Those are demountables.

BLACK: Demountables are flattops.

LARSON: Flattops.

LARSON: Oh, yes, you're right. You're right.

BLACK: They called them both, you know.

GOLDBERG: What is a demountable?

BOLLING: They were manufactured away from--out of Oak Ridge, and they were hauled in. Sometimes a truck would haul a complete flattop. Sometimes if it were larger, it would take two loads to haul it.

BLACK: And they were put together, and they were already furnished. They had the curtains, the furniture, everything. Just add people.

GOLDBERG: Who lived in one of these? Would it be families?

BLACK: Families, operators, construction workers, people waiting for bigger houses, bigger and better houses.

GOLDBERG: And who would live in the hutments?

LARSON: They were single people.

BLACK: Single people, construction workers, blacks.

LIVINGSTON: That's all the blacks had to live in, I believe, for a while.

BLACK: The soldiers.

00:33:17:00

GOLDBERG: The camp was segregated?

BOLLING: Segregated. Yes. Strictly.

GOLDBERG: I've got more here.

BLACK: I like this show and tell. [Laughter]

GOLDBERG: Is that the town site?

LARSON: That's a Cemesto.

BLACK: It could be close to town site. It's a "C" house.

BOLLING: That's a Cemesto.

GOLDBERG: What do you mean by "C" house?

BLACK: They had different designs.

LIVINGSTON: They had "A," "B," "C," "D," "E."

LARSON: It went all the way to "F."

LIVINGSTON: No, an "E" was the apartment.

LARSON: Yes, that was a house that had four apartments.

00:33:50:00 [Close-up of photo of a "C" type house]

BLACK: The housing was controlled by the Army. You could not just go in and say, "I want an A house, or a B house or a C house." You put your name on the list for housing, and it was done according to the size family you had, and you had to have so many children over a certain age of the opposite sex before you could get a two-bedroom or three-bedroom house. Most people went for the big house, you know, and they had big families. Oak Ridge had big families back then.

GOLDBERG: Do you remember what the rents were like? Did you have to pay rent?

BLACK: Yes.

BOLLING: Very, very reasonable.

BLACK: Fifty-four dollars, I believe, for a "C" house. Fifty-four dollars a month.

GOLDBERG: That would be a two-bedroom house, a "C" house?

BLACK: "C" house was three bedrooms.

BOLLING: I had a two-bedroom Cemesto.

LARSON: "B," "A"?

LIVINGSTON: "B" or "A"?

BOLLING: Let's see. I believe, when I first came, they called it a "G" and two bedroom.

BLACK: That was out in East Village probably.

BOLLING: East Village. And it was twenty-seven dollars a month, and you got your coal, and it would come in on the inside of the house. All of the coal that they had to heat the homes, the utility people would put it in a little window and then put coal in through this window, and it was on the inside of your house. When you fired the furnace, you'd lift up the door, and they gave you a shovel, and you'd shovel it in your furnace.

BLACK: From the closet to the furnace.

- BOLLING: And whenever it got hot enough, why, the blower would come on, and it was very hard to regulate that heat, very hard, very hard.
- LARSON: And if you had children at crawling age or, as I did, cats and dogs, we kept them in the furnace room at night, and they'd come paddling out across the floor in the morning leaving black footprints all over the place.
- GOLDBERG: These were more hutments, I gather.
- LARSON: That's a hutment.
- GOLDBERG: That's pretty typical.
- BLACK: No, that was at Scarborough. That was where the blacks lived, the black community.
- LARSON: And notice the boardwalks. That was what we walked on all the time.
- BLACK: The boardwalks, the clothes line, that's right.
- 00:36:19:00 [Close-up of photo of the Scarborough community hutments]
- GOLDBERG: You mean you didn't have regular sidewalks.
- BLACK: No.
- LARSON: No, and you couldn't walk in a path of dirt because when it rained, it was absolute gum.
- GOLDBERG: Well, that explains another picture I have here.

- BOLLING: How long did that last, this type? Seems like it lasted about three years or four.
- GOLDBERG: You mean the hutments?
- LARSON: I think through the war. You know, they had up to, I think, 102,000 people here at the peak of the war, and then it dropped.
- BOLLING: It dropped, yes.
- LARSON: I think that's what they took out probably first.
- GOLDBERG: 102,000 people here, is that what it was?
- LARSON: I believe so.
- GOLDBERG: So from nothing, essentially nothing.
- LARSON: From nothing, yes. But that included the construction workers who built, and then the people who had to manage it.
- BOLLING: That's right. The regular citizenry of Oak Ridge when it was at its peak, you know, the citizens living there, put down their anchor, the number was 75,000. But as she says, the construction workers living there, too, made the peak in Oak Ridge reach around 102,000. That's right.
- BLACK: People came in from other areas to work in the daytime or the nighttime, so that made the numbers more.
- LARSON: [Laughter] Oh, yes, stuck in the mud.

00:37:43:00 [Close-up of photo of a car stuck in the mud]
GOLDBERG: Stuck in the mud. I've seen a lot of pictures like that at Oak Ridge.

LARSON: Yes. Well, you just did.

BLACK: See, the roads weren't paved.

LARSON: The way they made those roads was they brought in-- they cleared the stumps out, you know, the woods out, and then they brought in gravel, and they would put in, as I remember it, it was three or four times a year they would put a layer of gravel on the road. And then people would drive over it, the buses mostly, because none of the rest of us had gas, and then that gravel would sink out of sight. And after it had sunk out of sight for a couple of weeks, they come along and put another layer down. Remember? They had to put about forty layers down before they could pave it, and it took a couple of years before they could really make paved roads. But it was just bottomless mud, red, gooey mud.

BLACK: They didn't have time to pave the streets, so none of the streets were paved, except the first street that was paved was around the hospital, because the doctors complained that the dust was settling in the sterile instruments, and they said, "We need these streets paved." So that was one of the first.

00:38:45:00
GOLDBERG: I guess one of the problems was since they built the whole town at once, everything was dug up all at once. Have you ever talked to anybody who lived in the Hanford area?

BLACK: No.

LARSON: Yes, I have.

GOLDBERG: They had a similar problem, but they also had--it was almost desert, so they had high winds and dry dust, dry dirt just blowing everywhere. When it did rain or when they did water it down. . .

BOLLING: We had water.

LIVINGSTON: We had all the rain.

00:39:20:00

LARSON: Remember they used to fuss about some of them would want grass in their front yards, you know, and then they had to really water and worked so hard. You know, you said everything was built at once, but the guest house, I believe, wasn't that there originally? Or maybe that was the first thing they built.

BLACK: That was the first thing they built.

BOLLING: That was the first thing they built.

LARSON: Was it? The first thing they built.

BOLLING: The guest house, they called it. It's called the Alexander Inn.

LARSON: Alexander Motor Inn now. I know it.

BLACK: And people stayed there while their houses were being built and while the schools were getting ready.

LARSON: I thought maybe--maybe it was the church that was still there.

BLACK: No, the church was a regular [United States] Army design, and it was built according to Army specifications.

BOLLING: They built one. . .

LIVINGSTON: An original one.

BLACK: No, there was an Arkansas house that was here, another church out on the turnpike, but it was just. . .

BOLLING: See, they built the chapel on the hill first, and later on they built the chapel in East Village.

LARSON: And it served all the different denominations, didn't it?

BLACK: Well, we went to church in the theaters, too. Remember that? Every denomination had a certain time. We were Catholics, and we got 5:45 in the morning for the chapel on the hill. Then the Baptists and the other people came in, and then the other. . .

LARSON: You must have been a minority. [Laughter]

BLACK: Well, no. Then later on in the day, we got the theaters. At eleven o'clock we had Groves Center.

LARSON: Is that right?

BLACK: And theaters.

GOLDBERG: I guess this would be--here's a sort of typical scene, I guess.

LARSON: The trailer. Isn't that a trailer and a beautiful garden.

GOLDBERG: These pictures, by the way, were taken by Ed Westcott, I think.

BOLLING: Made a real good history.

LARSON: Yes, he did.

00:40:52:00 [Close-up of photo of a house trailer]
BLACK: That's not a typical one, but that's a beautiful one.
[Laughter]

LARSON: Yes. People really enjoyed gardening.

BLACK: Really, when they could get stuff to grow.

GOLDBERG: Connie, you came in early '43.

BOLLING: '43.

GOLDBERG: The rest of you came in '43 as well?

LIVINGSTON: '44.

GOLDBERG: You came in '44.

LARSON: I came in September of '43. You probably came in August, because you apparently--before they were

employing people at the plant, I mean, you had to be employed in Knoxville.

LIVINGSTON: You didn't have a job before you came? Before you left Virginia?

BOLLING: I was teaching in Virginia.

LIVINGSTON: I know, but you didn't have a job here? You took it on faith.

BOLLING: They interviewed me in Knoxville.

LARSON: And that was before they had an employment office out at the site.

BOLLING: And they didn't have an employment office or anything. They hired me after they took my pedigree and everything. [Laughter] And told me to go to the Clinton Engineer Works, to go out Clinton Highway, Route 25W, I believe it is, and then get on 61. Route 61 came through Oak Ridge, right smack dab through Oak Ridge. Two lanes. It stayed two lanes coming through there, Oak Ridge, until they opened the gates in '49.

00:42:22:00

GOLDBERG: By open the gates, you mean just let people come and go?

BOLLING: They had about seven gates around Oak Ridge.

LARSON: And a chain link fence.

GOLDBERG: All the way around.

LARSON: All the way around.

BOLLING: All the way around.

LARSON: Couldn't get through.

BOLLING: They opened the gates, and we had a big celebration in 1949.

BLACK: They opened the gates to the city, but the gates were still closed to the plant.

BOLLING: They're still closed.

BLACK: They put up new gates to go to the plants.

LARSON: And you know, even after you got in through the gate, then you really weren't free to go. I mean, when we were interviewed to be employed, I remember there was just a small area where we could go, and then we had to get back out of the-- we couldn't stay because we had no assignment. We had to get back out through those gates. Remember? And they were always checking your pass and being sure that you were supposed to be where you were.

GOLDBERG: Colleen, when did you come?

BLACK: I came in July 1944. I was nineteen years old, and I didn't want to come, and I didn't want to stay, and I never dreamed I'd still be here forty-three years later. [Laughter]

00:43:32:00

GOLDBERG: Well, now let's talk a little bit about what you did when you got here. Three of you, I guess, worked in Y-12.

LARSON: I did.

GOLDBERG: That's electromagnetic separation. Colleen, you worked in K-25.

BLACK: I worked in K-25.

GOLDBERG: Let's begin with Y-12. I think it would be good to start with you, Connie. You trained people, right? I mean, you trained people to work in Y-12?

00:43:54:00

BOLLING: Yes. When I first came, they kept us at the main administration building there, the federal building, and gave us special training for about six to eight weeks before we could go on down into the Y-12 plant. Of course, [when we] went into the plant, we didn't have a building operating. Alpha One building was just about ready to come on line with its close to 200 calutrons operating, but they had something wrong at that building. Of course, they had hired all these people in and hundreds of technicians, and they didn't have anywhere else to go except to come into this building at Alpha One. We were trying to get it into operation. It's a very technical thing to get these calutrons into operation. You had to go through a great deal of technical operations before you could get into operation. You had to have a lot of--you could write a volume about the. . .

LARSON: You had to have a vacuum, for instance.

BOLLING: . . .vacuum system of one of those buildings. And then you could write a whole volume about the operation of the cubicles and what each one meant. But I didn't know what everything meant about a cubicle or about a track at all. I wasn't supposed to ask any questions. All I was supposed to do is to get the proper reading on certain needles. [Laughter] And train the operators

who came. As soon as we got the buildings in operation, they hired the operators by the hundreds, and by the time they got to peak production in Y-12, there was 22,000 people in Y-12. I checked this over with an old timekeeper to make sure before I came here, and his name was Mr. Rice, who was the first timekeeper in Y-12. I said, "Is it a fact that we had 22,000 people working in Y-12 trying to operate these calutrons and all the support workers?" He said there was more than 22,000. It's unbelievable.

As soon as they started coming in, why, we established classrooms in different buildings to train these operators.

GOLDBERG: That was your job?

BOLLING: That was my first job.

GOLDBERG: To train the operators.

00:47:02:00

BOLLING: Training operators and also vacuum operators. The vacuum operators, they had the biggest load. If they made one valve opening that they're supposed not to open, they'd ruin--I believe they had eight of those calutrons hooked on to one header, and if they opened the wrong valve, if the handler foreman called down from the floor, from the track, to say, "We're going to pull tank (they didn't call it calutron), we're going to terminate D number 48 . . ."

GOLDBERG: They called it a D?

BOLLING: No. "We're going to terminate number 48." We'd call 'em from the track. I mean, call them from the cubicle room. The charges run out, you know. And we'd call the handler, we'd call the vacuum. First we'd turn the heater off, of course, of the calutron, the operator would, and then the operator would call a kind of

a very secret number, a telephone number, and that was the people who would come and get the material, get the material out of that E-box.

00:48:25:00 [Goldberg displays an aerial photo of the Oakridge facilities]

GOLDBERG: Okay. Now, we've got a lot to straighten out here. I'm going to go back and question closely. First of all, this is the area we're talking about, right?

BOLLING: Right.

GOLDBERG: The town is behind here?

LARSON: Yes, that's right.

00:48:38:00 [Goldberg indicates the town in the photo]

GOLDBERG: So the town is behind here, and if you're in the town, then you really couldn't see into here.

BOLLING: Oh, no. No, no, no.

GOLDBERG: That's one of the reasons that we put this--that the Army picked this place.

BOLLING: Secret. I mean, if something blew up or anything, why, it wouldn't hurt anyone.

00:48:53:00 [Goldberg indicates the Y-12 buildings]

GOLDBERG: So all these buildings here are part of Y-12 as it was during the war.

00:49:02:00 [Goldberg hands the enlarged aerial photo to Bolling]

BOLLING: Yes. Let me see here now.

LIVINGSTON: Is this looking east?

LARSON: Isn't. . .

BOLLING: Yes, this is looking west, and right here is. . .

LIVINGSTON: If we're looking west, the town is over that ridge.

BOLLING: We're looking west.

GOLDBERG: But the point is that the town. . .

BOLLING: Here is the present water plant of Oak Ridge today, and this is, I believe, Beta Four right here.

GOLDBERG: Where?

BOLLING: Right here. Beta Four.

LIVINGSTON: When you're looking east.

00:49:38:00 [Bolling points to each of the four Beta buildings in the photo]

BOLLING: They had four Beta buildings. Here they are right here. One, two, three, four.

GOLDBERG: Let me put it down over here so that we can get it on the camera.

BOLLING: And they had five Alpha buildings.

GOLDBERG: These are the four Beta buildings, here, here, here, and here. The five Alpha buildings were back here?

BOLLING: Back. They were back east.

LIVINGSTON: They were east of the Beta ones.

GOLDBERG: Oh, east of the Beta ones.

LIVINGSTON: And that picture is made looking east.

GOLDBERG: I see. So that they'd be back this way.

BOLLING: I believe it's looking west. [Laughter] No, it's looking east. Yes, you're looking east. That's right.

00:50:18:00
GOLDBERG: Okay. Now, you said you trained people. Did you know what you were training them for?

BOLLING: No! We just trained them.

LARSON: To look at the needles.

BOLLING: To put the needle on one thing. I didn't know what it was.

GOLDBERG: The needle in a meter.

BOLLING: Yeah. Keep it on there.

LIVINGSTON: R, Q.

LARSON: maximizing. . .

BOLLING: They soon learned what made the better readings, you know, and the perfect readings. Of course, you

couldn't get a perfect reading, but they soon realized if they got too much heat on the unit, that it would spark too much and they couldn't keep their cubicle on, the calutron wouldn't operate. Or if they let pressure maybe--sometimes they'd develop a leak. And before you could operate the calutron, you had to have almost a perfect vacuum. Sometimes leaks did develop, and it would throw the operation all off, you know. Sometimes it was cooled inside there with water, you know, circulating through copper tubing all around your D unit. And sometimes these beams that were arced across, they would hit these water lines and your run would be bad. You'd have to pull it.

00:51:48:00

GOLDBERG: What I want to do is go back now. If you didn't know what you were doing, what did they tell you you were doing? And what did you, as a trainer, tell someone you had to teach?

BOLLING: I'll tell you one thing. I didn't tell 'em anything. I had 'em ask me, "What is this? What's that stand for?" I would not answer. I'd say, "I don't know." Because many did answer questions and say things or even guess what it is, and they were gone the next day.

GOLDBERG: [Laughter] Well, let me turn to you and ask you, Jane, what were you told? You ran one of these cubicles. You were a cubicle operator?

00:52:40:00

LARSON: No. No, I was hired as a historian, and then I became a technical editor. So I went through the course that explained what we were doing in Y-12, because after that course was through, which was another six to eight weeks, I went down to the plants and went to XAX, where they had the first experimental D that was blown up in size from the small one out in Berkeley to what they thought they wanted for Alpha, for XAX, the Alpha production building. And this

XAX had just the one dee, and they were experimenting with it to be sure that they had blown it up to the size without wrecking it. So I did know more or less what was being done, but my job was, I was kind of a reporter. I would go every morning to these men who were trying to get the vacuum, or they were trying to get the--you called it heat--the electrical power way up high, and they were always having trouble, always having leaks, spending the nights at XAX, trying to correct something. And I would have to report, then, what their progress had been and take it into the division head. So it was all classified, which meant that I couldn't talk about it. I could ask questions, and they would tell me what to write down. I would take it to my boss, but I couldn't talk about it to anybody.

GOLDBERG: You were a cubicle operator?

LIVINGSTON: Uh-huh.

00:54:20:00

GOLDBERG: What were your instructions?

LIVINGSTON: I went to a training class up at the castle on the hill, we called it, at the AEC [Atomic Energy Commission] building.

LARSON: Manhattan District.

LIVINGSTON: Yes. And I think we were in a holding pattern until our building--I started in Alpha Five, and it was not quite ready, I think.

LARSON: Oh, yeah.

- LIVINGSTON: And they didn't tell us much of anything. It was mostly scaring us. [Laughter] You know, "You can't talk about anything at all."
- GOLDBERG: Something like this?
- LIVINGSTON: Well, we didn't see anything until we got down inside the building.
- 00:55:05:00 [Goldberg selects a photo from the interior of the Alpha Five building]
- GOLDBERG: Right. But this is where you ended up.
- LIVINGSTON: That's where I started. The first day I went to work on my own, I got terribly lost. [Laughter]
Everything looked the same in the building. How many floors? Two or three.
- 00:55:23:00 [Close-up of photo of female operators seated at their cubicles]
- BOLLING: It had two floors, one main floor, where the cubicles and the calutron. . .
- LIVINGSTON: And there was a heater room and then a. . .
- BOLLING: And then under that was a heater room. It was kind of a--well, it wasn't really--it was just on--they had to sit on a platform, just a half a floor, you might say.
- LIVINGSTON: I was eighteen years old, and it was pretty frightening to walk in a building that looked like that. [Laughter]
- GOLDBERG: Was it noisy?

LIVINGSTON: Very noisy. Very noisy. And I didn't want to ask anyone how to get to where I wanted to go, and I didn't actually know where I needed to go. [Laughter] So I kept wandering around and wandering around and kept passing the same group of men, and they were enjoying it thoroughly. [Laughter]

LARSON: In XAX, where this experimental D was, the engineers--there were a lot of G.I.'s who were engineering students or perhaps were just within a year of graduating in engineering. They would struggle with the cubicle, you know, and it was a very difficult thing to try to maximize the different variants in order to be able to get a beam. And then if you could get a beam that was maximized, that happened maybe once a week. And here to have women, particularly East Tennessee women, some of them, who were able to run a cubicle. And didn't you say that you ran several cubicles?

LIVINGSTON: Yes, later on we did, but we just--I just learned by watching the person.

GOLDBERG: By rote, essentially.

LIVINGSTON: Yes, right. And everything was coded, you know. You had a Q- and an R-meter and the temperature and all that.

GOLDBERG: Do you remember what the instructions were?

LIVINGSTON: You had a telephone. No, I don't recall any of that. But as you say, you just get used to knowing what. .

GOLDBERG: What you had to do.

00:57:24:00

LIVINGSTON: What you had to do. I knew that there was a charge bottle; I knew that we vaporized something, and it went into collectors, and I knew that you had to use the telephone. We had people who stayed out on those tracks, and they used liquid nitrogen traps, you know, and had to maintain your pressure, your vacuum, and so on. And so you'd say, "Add some 714 to unit so and so," or something. That was the code word for liquid nitrogen.

BLACK: For liquid nitrogen. We called it L-28.

LIVINGSTON: Did you? [Laughter]

BLACK: Same thing.

GOLDBERG: So you called liquid nitrogen 714.

LIVINGSTON: 714.

GOLDBERG: But you didn't know what it was?

BLACK: Oh, we knew what liquid nitrogen was.

LIVINGSTON: Yes. You know, they carried it around in a bucket. [Laughter] You could see the. . .

GOLDBERG: Fumes coming out.

LIVINGSTON: Yes.

GOLDBERG: Do you know what the numbers refer to--714?

LIVINGSTON: Yes, my son told me last week. [Laughter]

GOLDBERG: Nitrogen is the seventh element.

00:58:35:00

LIVINGSTON: My brother was in the Seabees [United States Construction Battalions], and he was in the South Pacific, and he wrote a letter once, and he said, "I hear you're working with uranium in Oak Ridge." And I took the letter to. . .

GOLDBERG: Wow!

LIVINGSTON: . . . my foreman, and I said, "What do you think about that?" [Laughter] He said, "Put that away and don't say anything to anyone about it." [Laughter]

GOLDBERG: You didn't know that you were working with uranium?

LIVINGSTON: It was early '45.

GOLDBERG: What did you call it? If you didn't know it was uranium, did you call it anything?

BOLLING: Uranium was never mentioned.

LARSON: The product. Didn't we say it was the product?

LIVINGSTON: The product. The product. We kidded about it being green paint, because everything was painted green. [Laughter]

00:59:28:00

GOLDBERG: Let's get this out. When you talk about the Alpha track, this is the track, right? It looks like a race track.

BOLLING: That's right. It had 96 calutrons.

00:59:36:00 [Goldberg refers to the photo of the female operators at their cubicles]

GOLDBERG: This here that we looked at before, these are the control panels for controlling. . .

BOLLING: These.

GOLDBERG: These. And each one of these stations is on the inside.

BOLLING: Now, you had calutron units, they were placed inside, you know, two of these on the outside.

00:59:56:00 [Goldberg places photo of alpha track on the easel]

GOLDBERG: Let me put this up here.

01:00:00:00 [Close-up of photo]

BOLLING: Therefore, we had to keep about three or four handlers to do the work on the inside, around the inside of this track.

GOLDBERG: This is an Alpha track.

BOLLING: Alpha track.

LARSON: I was going to ask you, weren't they scared to go in there? I don't remember seeing anybody go in there.

BOLLING: The first thing that we were told to do in training the operators was to--I was particularly interested--you didn't have any training foreman to take you over whenever you hired in?

LIVINGSTON: No.

01:00:42:00

BOLLING: Now, when we first--when the hiring was first done, the training foreman, we had a training foreman on each shift--day, evening, and at night. And he had his quota of operators to train, vacuum operators, cubicle operators, and we trained these people for about--I believe it was six weeks. Eastman was--we trained 'em six weeks.

GOLDBERG: Tennessee Eastman [Kodak] Company.

BOLLING: Tennessee Eastman. And we even graded them. They wanted 'em graded. And we had our own classroom in Alpha One and Alpha Two, and I remember having--I would generally get about eighteen to twenty operators, cubicle operators or vacuum operators and even handling operators and train 'em for this period. Six weeks, I believe it was. And then during this program, the training foreman had--they called it a header in the vacuum system that was connected onto A to these calutrons out in the track. And they gave the training foreman eight cubicles, and it was up to the training foreman to go out there and operate those cubicles with these brand-new people. And we were told to especially get these operators used to the great noise and the sparking and get 'em used to it, because it was frightening.

01:02:34:00

GOLDBERG: Were they told that there was a very strong magnetic field?

BLACK: You couldn't wear bobby pins.

BOLLING: Nobody was told anything about it. The magnetic field was not mentioned. They called it a Z.

LARSON: That's right.

BOLLING: And the first time I went down into Y-12, the only building that was trying to get in operation was Alpha One building, and we got the word that they had lost the Z. That meant that it didn't have any magnetic field. So we hunted and we hunted and we hunted for the Z. All I saw 'em do is to take loose a lot of pipes, and we had to clean these pipes. I don't think the pipes is what was wrong with it; it was something else. It was the electrical, as you mentioned.

LARSON: It was the power.

BOLLING: The electrical, maybe.

GOLDBERG: While I've got this, let me just point out for the camera, when you talk about a D, I guess the name "D" came from the shape.

LARSON: That's right.

GOLDBERG: This is what you're talking about, a unit like this.

LARSON: Right.

01:03:50:00 [Goldberg indicates the cyclotrons near the alpha track]

GOLDBERG: Which, technically, in California was being called a calutron.

BOLLING: Right.

LARSON: Right.

GOLDBERG: The University of California Cyclotron.

BOLLING: That's right. Cyclotron.

LARSON: I think maybe it was just XAX and XBX, these experimental units.

BOLLING: They called that the pilot plant.

LARSON: That's right. The pilot plant. Absolutely right.

BOLLING: And we came in there. That was the first calutron I ever saw, came into what you're talking about. They had it roped off way around it, this small building, 9731 is the number of the building, and they had XAX, XBX, wasn't it?

LARSON: Both of them.

BOLLING: Yeah. And it was roped off, and every inch around, people were standing around that rope, mainly engineers and technicians and so on, wanting to see that thing. We couldn't get up to it. We couldn't get within--well, twenty-five or thirty feet of it, because it was important stuff. We wasn't supposed to--we were just watching a man operate it. They had one man there operating it.

LARSON: Struggling. [Laughter]

BOLLING: One of them, you know. He was struggling with it, and he had his hand on that rheostat the whole time. I was watching him, and I remember he had half of his--had two fingers off. Later on, he became a good friend of mine, Jim Lister. That was the first man I ever saw operate a cubicle, was Jim Lister. I remember when he had his hand on the rheostat, he just had two fingers and a

thumb, and I said, "Well, gee whiz, he's doing something handicapped that way. I ought to learn that." [Laughter]

01:05:42:00

GOLDBERG: Now, there is a rumor that has persistently gone around with regard to this, and that is that the people who understood what it was, the scientists and the engineers, who actually built them or designed them, but knew what was going on, when they tried to run these things, they couldn't do it as well as the operators.

LARSON: That's exactly right.

GOLDBERG: Is that right?

LARSON: It certainly was. I saw that with my own eyes.

BOLLING: And Dr. Lawrence said that these things cannot be--he invented it, you know.

GOLDBERG: Ernest [Orlando] Lawrence.

BOLLING: E.O. Lawrence. He said, "They cannot be operated except by an engineer or. . ."

LARSON: A Ph.D.

BOLLING: A Ph.D., really? And the girls, they proved that these women operators did it as good or better than the engineers.

GOLDBERG: Why do you think that is?

BOLLING: Well. . .

BLACK: More patience.

LIVINGSTON: We do what we're told. [Laughter]

LARSON: I think patience is a good word for it.

LIVINGSTON: I think that's it, and they were so eager, and they knew what they were trying to do on a deadline. I think that was it. They pushed everything to the limit.

01:07:04:00

GOLDBERG: Where did these women come from mostly? From locally? From Tennessee? You came from Virginia.

BOLLING: I came from Virginia. The operators and the handlers, most of 'em came right out of the high schools. They had to be a graduate of high school, have their diploma, and locally, I would say that most of them were local.

01:07:34:00

GOLDBERG: Now, you said before that the camp was segregated. Were there black women who were operators?

LIVINGSTON: No.

BOLLING: No way. [Laughter] They couldn't get in the building, except to clean. Now, they were there cleaning.

LARSON: It was a different world.

LIVINGSTON: We had to wear uniforms, and we always had black women in the change houses looking after things.

- LARSON: I can remember one of my first nights on the night shift at XAX. A cleaning woman, a very nice-looking young black woman, came up to me and asked me if I had any books she could borrow. I did lend her some.
- GOLDBERG: So, I mean, not only was it segregated with regard to where people lived, but in fact with regard to the jobs that people could get.
- LARSON: But you know, that was another day.
- GOLDBERG: I understand.
- BLACK: And it was education. Like he said, they had to have a high school diploma.
- LIVINGSTON: Well, no, it was more than that.
- LARSON: Well, it was the Army, too, the way the Army was structured.
- GOLDBERG: The Army was structured that way, too, at the time.
- LARSON: Yes.
- 01:08:40:00 [Goldberg places a photo of a Beta cubicle on the easel]
- GOLDBERG: Well, let's see. This is another cubicle. This is a Beta cubicle; it's different than the Alpha. They were smaller.

- 01:08:48:00 [Close-up of photo of female operator at Beta cubicle]
- BOLLING: Yes. They did the work--they received the unrefined--it wasn't completely refined in the Alpha building.
- The product went on to the Beta building, and the arc, the electromagnetic arc in the Beta building, I believe, it was a lot less, shorter. I believe it was 24 radius, 24 inch.
- GOLDBERG: You mean the curvature of the D was less?
- BOLLING: The D was a lot larger than that, but the arc had a radius of 24 inches shorter, and the Alpha had a radius of 48, I believe. After forty-some years, I can't remember exactly.
- LARSON: I kind of think you're right.
- BOLLING: But I believe it was 48 inches arc in the Alpha.
- GOLDBERG: But the instructions would be essentially the same. You had Qs and Rs.
- LARSON: Rs. And you maximized the beam, you tried to get the best vacuum and the best focus . . .
- LIVINGSTON: Strike a J. [Laughter]
- LARSON: Oh, gosh, doesn't it come back?
- GOLDBERG: Strike a J?
- BOLLING: Well, now, in turning one of those, getting a calutron cubicle to operate, you'd start at the bottom. You had one main power switch. You know, you'd turn it on at the bottom. Your

vacuum is all right, and your charge is out there ready to become vaporized. The molecules would come up out of the charge box.

GOLDBERG: But you didn't know that at the time.

BOLLING: Yeah, I knew that.

GOLDBERG: Oh, you did?

BOLLING: I knew that much. And. . .

LIVINGSTON: I think I knew that much.

01:10:32:00

BOLLING: And then whenever you got the right vacuum on that tank where that calutron was, you turned your main power on, and then you came up and you turned your heaters on. Whenever you turned the heaters on to this source, which was a charge-- we called it a charge--it was about--the bottle was about--it wasn't glass now, mind you, it was about that square, the square of that envelope. [Bolling holds up an envelope] Wasn't very large. And whenever you turned your heaters on your source, which was TL-3, I believe, however, we didn't know it was TL-3 then, but I do now know that that was what they called it, we'd turn the heaters on, and, of course, you had outgassing, and your pressure would rise. You wouldn't try to turn that cubicle on because it wouldn't stay on. Whenever you heated it up enough and you got it pumped down real good and had your gate valves open to your diffusion pumps--they were operated with oil, the heating of oil, which would come up and they'd draw the air back down and exhaust it. They were very good pumps. They were big around as this and very, very large. They had two of those diffusion pumps under every tank, each one of these calutrons. Whenever you got your vacuum just right and your high voltages stay on, then you would turn your Ks on,

one, two, crank 'em on. Okay. That might knock your cubicle off. You'd have to work with it a little bit. Am I telling this right?

LIVINGSTON: I believe so. [Laughter]

BOLLING: You'd turn your Ks on. Your K was a filament out there right above your charge box, you know, where that vapor was coming up. Okay. You'd go pretty slow with it, the operator would. This K filament now is made out of tantalum, I believe, a very hard source. And it would strike, whenever the vapor got right, why, you'd have a little arc across here. You'd call it striking a J, striking a J. Okay. Now it was time for you to turn up your M voltage to 35,000, also put your G voltage at 35,000 negative, and your M voltage was positive. They were very close above this charge that was ionizing.

GOLDBERG: You said the M and the G. That's the stuff you're talking about, that is, the grid and the--that's all in the race track.

BOLLING: Oh, no, no.

LIVINGSTON: You can't see it.

BOLLING: Yes, it's in the race track, in the calutron, yes.

LIVINGSTON: You have to imagine it.

BOLLING: Yes.

GOLDBERG: You're just looking at the meters, right?

LIVINGSTON: Just the meters.

BOLLING: Now, whenever you strike a J, why, it'll show up on your cubicle meter, you see, and your K voltage, when you turn that on, why, your voltage would show up right.

GOLDBERG: And that's all you would know.

BOLLING: And then whenever you started to turn your M voltage up to 35,000 positive and your G voltage was 35,000 negative, which made it zero there right where the vapor comes out, where the molecules comes out of your charge bottle, they called it. And whenever you put the high voltage to it, why, then it'd throw it up into an arc, a four-foot radius arc, and it'd come back in--the product would end up in the E box at the top of your calutron out there at the track. And whenever it did, why, whenever it hit the E box, you'd see readings of the Q and the R.

LARSON: Because it was split. The product was split into a heavier part and a lighter part.

BOLLING: The heavier part, I believe the U_{235} was the heavy part, it'd fall first, wouldn't it?

LARSON: I think it was the other way around.

LIVINGSTON: Other way around. The 238.

BOLLING: The Q. And the R is the Uranium-238. It'd fall in the next slot. Whichever one, I can't think just right which one it was. Anyway, it'd be called in the E box, it'd hit on a bird cage in the E box, they called it, bird cage. And then it'd run like that until it exhausted the charge. In the Alpha buildings, how many days would it. . .

LIVINGSTON: Seems to me like it was seventy-two hours. I don't know.

BOLLING: It'd run about three days before it'd exhaust that little charge, just a six-inch square box.

01:16:08:00

GOLDBERG: Did you ever see the product? Did you have any idea?

LIVINGSTON: Oh, no.

BOLLING: I did. I wrote about it. That scared me. I was wanting to find out about that stuff. Everybody had a badge. The operators, I believe, had a "2", didn't they, on the badge?

LIVINGSTON: I don't remember.

BOLLING: And the heater operators and vacuum operators, they just had a "1" on their badge, and they couldn't come upstairs. The vacuum people in the basement and the heater people that operated the heaters, they couldn't come up on the top floor where the cubicles were. They had a guard at the stairs.

LARSON: That was really how they kept that compartmentalization. That's what they called it, the way they kept it secret, because people couldn't really put things together.

GOLDBERG: Does that look familiar?

01:17:10:00 [Close-up of photo of guard checking on employee's badge]

BOLLING: Oh, yes. And you could go wherever--what number was on your badge. You had your picture and you had either no number--a person wearing no number on his badge, why, they worked streets, maybe, worked out there, didn't have to go in any of the buildings. They worked outside. And the people that worked in the basement, they had a "1". Then some of them had "2" on their badge, and they could only go so far in the building. So they had thousands of guards. Well, not thousands, but hundreds of guards back at that time. They had to stand at these doors to keep people--they didn't know what they were guarding, but they said, "Don't let anybody with a badge number--unless they've got a "3" on their badge, don't let 'em come through here, "3" or higher."

GOLDBERG: So that there were all kinds of things going on in this building that you didn't even know about. Is that right?

BOLLING: Well, I had access to the whole.

GOLDBERG: What was the number on your badge?

BOLLING: "3".

GOLDBERG: It was "3". If you had had a "2" on your badge?

BOLLING: I wasn't supposed to do or go into certain areas.

LIVINGSTON: You'd go in the mechanical area.

BOLLING: Go in the mechanical area.

01:18:37:00

GOLDBERG: How many different numbers were there?

BOLLING: Well, very few "4's". I believe the superintendents of the buildings had "4" on their badge, and engineers and foremen, they had a "4" on their badge. And a "5" was the highest number they had on a badge. They were supposed to know it all, what was going on.

GOLDBERG: Meanwhile, you were somewhere else.

01:19:12:00 [Black displays her husband's badge]

BLACK: Meanwhile, I was in K-25. We weren't number coded; we were color coded. [Laughter] This is my husband's badge. But it had three colors on it. Now, he was just allowed to go in, say, where we worked in the conditioning building and to the cafeteria and a color to the restroom. And we were not allowed to go anywhere else. But it was the same thing. We were just in our little compartments. And in the city, if you lived in the city, you had to wear a badge if you were thirteen years old or older. Everyone had to wear a badge. And even if you walked on the street and went to a movie, you should wear a badge. And you were stopped at the gates going into the city to make sure that you had your badge, or you could get a pass for someone.

LIVINGSTON: Did you work in the operations part?

01:20:34:00 [Begin U-Matic Tape 2 of 2]

BLACK: I worked in the conditioning building at K-25, and we [tape interrupted] and then we'd mark it, call the inspector, and she would come and inspect the leak and see if it were really leaking. Then we'd call the millwright and he'd take the pipe away. And we did this all day long to make sure these pipes were tight,

to go over to the big building, to get the U₂₃₅. I didn't know that. I didn't know what they were doing with all those pipes.

GOLDBERG: Did you know where the pipes came from?

BLACK: I knew they came in one door and went out the other door. [Laughter]

GOLDBERG: And did you know what you were testing them for?

BLACK: No.

GOLDBERG: Just leaks.

01:21:05:00

BLACK: No, just leaks. I worked for my husband. He wasn't my husband then; he was a G.I. Like I say, everything had a code name. He was SED--Special Engineering Detachment. He was a college graduate, he'd been drafted, and I think he was ready to go overseas when they decided to take all these guys and send them to Oak Ridge. They needed engineers desperately and scientists and physicists. So he came here, and he was getting fifty dollars a month Army pay, and he was working alongside other guys who were making, oh, three or four times that much, but he was happy. He was living in the barracks with a lot of other engineers, and they worked shifts just like the other people in the plants. They didn't have mess halls. They had maid service in the barracks. Somebody came and made up their beds. He said one time they sent down some guy that was going to shape up the Army and bring them out with the bugle call and make them do calisthenics, but it didn't work, because these guys worked shifts, and they worked seven days a week, and they were on call. So they got rid of that guy, and he went back to regular shifts.

LIVINGSTON: I remember G.I.'s in the Alpha building, but I don't remember any in the Beta.

LARSON: No, I think it might have been a little too late by then.

BLACK: I don't know. They were here in '44, '45, and '46.

GOLDBERG: Was that your only job, testing for leaks?

BLACK: Yes. I was trained for that. I hired in and was sent to Wheat school, which was in K-25, an old school that had been a school. They taught me. Some G.I.'s taught me how to find the leaks. I stayed there until my clearance came through, and then I was sent to the conditioning building.

01:22:48:00

GOLDBERG: Why was it called the conditioning building, did you know?

BLACK: Because you conditioned the pipes to go over in the big building.

GOLDBERG: Did you know how you conditioned them? I mean, what that was.

BLACK: Well, I didn't know. No. And I didn't ask.

GOLDBERG: Were people near you doing that job, conditioning?

BLACK: Yes. In another part of it, they called it the basement, they were doing converters. I don't know exactly what they were doing, but sometime they would send me down there to find leaks, and you had to climb up real high, and the girls wore fatigues or pants. You know, in those days, women--it wasn't nice

to wear pants or slacks, but that was when we first started wearing slacks and pants, and you had to climb all over these pipes and find the leak. I didn't know what we were doing. I didn't ask. I know one time one of the G.I.'s told me, "If you ever smell anything, get out of here." So I thought, "Well, something must be going through these pipes that smells bad." [Laughter]

GOLDBERG: Did you have any idea what it might be?

BLACK: No, no.

GOLDBERG: Do you know now what it was?

BLACK: I guess so. I don't know. You know, I really wasn't interested in that. I think my husband did. And it was funny. I talked with someone from the library, and she said that the U volume of the Encyclopaedia Britannica was worn out where some people would come in, the G.I.'s, and they would follow down the U to "uranium." And she didn't know why that page was worn out, so she called New York and asked for a fresh book, and they said they didn't have it, they weren't making it. But she had one copied and had the page put back in, and again, it was just worn completely. [Laughter] So somebody knew, had a suspicion.

01:24:30:00

GOLDBERG: Well, it turns out, I think conditioning of the pipes meant filling the pipes with fluorene gas so that the nickel plating in the pipes would get conditioned. I think.

BLACK: Oh, is that right? Well, it could be.

GOLDBERG: Well, let's take a break.

01:24:48:00

01:44:34:00 [Interview resumes]
BLACK: And we had about--what?--three or four bowling alleys.

BOLLING: I was married, and I didn't do anything. [Laughter]

LIVINGSTON: We worked seven days a week, the clock around.

LARSON: I can remember that the hardest thing was to get to the laundry, because that had to be done once a week, and we never did our laundry at home during the war.

01:44:56:00
GOLDBERG: Could you have done your laundry at home if you had wanted to?

LARSON: I had to do it on a scrub board, by hand.

BLACK: There were no washing machines.

LARSON: And so we'd take the shirts out, take everything out to the laundry.

BLACK: I took mine to one, and they called it the shredder. They could shred your clothes in about a week, and you'd come back. [Laughter] If you really wanted anything, you know, nice, you'd have to scrub it on the scrub board and just rinse it in the sink. And if you hung it up in the dormitory and you had panties with elastic in them, they'd get stolen, you know, because the elastic, the rubbers and stuff had gone to war. And so you never hung your clothes out in the dormitory. But in the houses, when you lived in the houses, you left your door open; you never locked your doors. You never locked your car.

LARSON: I doubt if it had locks.

BLACK: I don't know whether they did or not, because everyone in the community who was there had a Q clearance, and you knew they were pretty good. I don't know what happened to the girls in the dormitories, but anyway, they did take underclothes and silk hose once in a while. But in the community as a whole, there were no crooks. No robberies.

01:46:05:00 [Goldberg places photo of security gate on easel]
GOLDBERG: Let me show you this picture. Would this have been one of the gates around the camp?

BOLLING: Around the city, I believe that is.

GOLDBERG: Around the whole city?

BOLLING: Yes. We had, if I remember right, we had seven gates. Is that your. . .

BLACK: That's about right.

01:46:30:00 [Close-up of photo of open plant gate attended by two guards]

BOLLING: We had the gate that was mostly used was called Elsie Gate, and all traffic had to come through old Route 61, and it came under a railroad overpass, and trucks kept hitting that with their top load, you know. It was so high, it just scraped that underpass, two lanes, and it's very narrow, and the underpass is there today. And then you can see part of the history of Oak Ridge. Right there at Elsie Gate is where this underpass is. And in fact, I helped make a video of the early history of Oak Ridge, and that's where we started with this video is at this Elsie Gate at this railroad overpass.

And all the traffic that was coming from the east, you know, from Clinton, had to come through this little narrow--it was very narrow, just barely room for--well, a truck and a car couldn't go through it together if they met there.

LIVINGSTON: All your visitors had to stop there and get a pass.

BOLLING: At Elsie Gate, yes. Elsie.

LARSON: Yes. I think that picture is one of the less used gates.

BLACK: I don't remember which one that is. It looks like maybe a plant gate.

LARSON: I was just going to say it might have been.

BOLLING: I believe that is what they call White Wing Bridge Gate.

LARSON: I remember that the only cars that were able to go from plant to plant were official cars, and there were no private automobiles allowed in that entire long, you know, three valleys, essentially. If you did have to go to another plant, which I would have to do once in a while, you were chauffeured. They called a driver and he brought you.

GOLDBERG: Here's another one.

LARSON: Oh, yes.

01:48:50:00 [Close-up of photo of an Oakridge watch tower]

BOLLING: They had that especially. Now, that was around the place where they really made the parts to the bomb. I recognize that, because that's around 9212 building, and they had four of

those guard towers around this area. And in that area is actually where they were making the real, well, parts. It's a known fact today that Y-12 is a war. . .

LIVINGSTON: Weapons.

LARSON: They also made the parts for the bomb that was dropped on Hiroshima.

01:49:38:00

BOLLING: They made it right there, yes. After I got through with the--by the way, the calutrons that made the first material to make the bomb, as soon as they dropped it, all of these buildings that housed these calutrons with these 22,000 people and support workers, they began to close down just as soon as the bomb was dropped. Whammy! All the Alpha buildings began to close down, and at one time, 10,000 people were terminated with--of course, they didn't terminate them all in one day, but just in three or four months, 10,000 people went out of this Y-12, and I was lucky enough to stay. And they kept the Beta buildings to refine from K-25, material from K-25, because K-25 wasn't up to making the material at the right. . .

GOLDBERG: They were doing separation in K-25.

BOLLING: Yes, but. . .

GOLDBERG: Then refining it further in. . .

BOLLING: In the Beta building. They sent it up here to us, and we operated in the Beta buildings for two more years, but the Alpha buildings closed out in about '45, and they had the mass termination. And then they kept the Beta buildings until '47, 1947. Eastman went out, and [Union] Carbide. . .

GOLDBERG: Tennessee Eastman.

BOLLING: Tennessee Eastman went out. Carbide took over in '47. And they closed the Beta buildings down because K-25 had built another building there, K. . .

BLACK: 29, 31.

BOLLING: K-29, and it was able to make the pure [U]₂₃₅ all right.

GOLDBERG: All by itself.

BOLLING: All by itself. And we closed the beta building down, and then we had another exodus of termination of people out of Y-12. Don't you know that by 1947, it was the beginning of '48, everything was on standby in Y-12, except we were doing an experiment. I got to stay on, and I did experiments with the alpha building, and we were trying to just see how much we could produce out of one of these big alpha units, and we had about eight of those calutrons, those alpha calutrons, and we had what we called the 8J jobs, the 8J calutrons. And I want you to know that in '47, the population of Y-12 had drifted down to four hundred-and-some people.

GOLDBERG: From 22,000 or more.

BOLLING: Right. And I stayed on with this development operation of the calutron for two years, almost three years, and we tried to see how much we could produce with that. They said, "Let's see if we can't beat K-25."

01:53:18:00

LARSON: Actually, you know, management--I watched that period, too, and they were trying desperately to find

work that they could bring into Y-12 so that they wouldn't have to--you know, it was terribly hard on people.

BOLLING: Yes.

LARSON: And that was one of the things, that major effort, and I believe brought the weapons program in at that time. They had an experimental program on--you know, of course, the atomic-powered submarine was under way, and they had an experimental program on trying to make an airplane that could be fueled by a nuclear--remember that? Yeah.

GOLDBERG: An atomic-powered airplane?

LARSON: Right. But they decided it was too heavy.

LIVINGSTON: Aircraft nuclear propulsion.

GOLDBERG: You worked on that?

LIVINGSTON: Uh-huh.

01:54:03:00

LARSON: And then they started the isotope separation, you know.

GOLDBERG: Stable isotopes.

LARSON: The medical. . .

GOLDBERG: Producing stable isotopes for. . .

LARSON: Producing stable isotopes for medical purposes.

- LIVINGSTON: Yes. And in one of the alpha buildings is where my husband worked, they built an 86-inch cyclotron.
- LARSON: Oh, is that right?
- LIVINGSTON: Remember the Ds were vertical, and that was something brand new?
- LARSON: I'd forgotten about that.
- LIVINGSTON: They produced radio isotopes.
- GOLDBERG: Those are the Ds that they have up in the museum in Washington?
- LIVINGSTON: No, no.
- GOLDBERG: No?
- LIVINGSTON: No, because I think it's still operating.
- GOLDBERG: The Ds from one of those cyclotrons are in Washington, but that's from another plant.
- LIVINGSTON: Oh, it was the heavy ion, the 63-inch. That's true.
- 01:55:02:00
- GOLDBERG: Well, let's go back. In the article that you wrote on this, you said that when you first came, you didn't have anyplace to sleep.
- BOLLING: No, I didn't have anyplace to sleep. They were building the dormitories for us. I believe they had

built something near--somebody said seventy. I never have counted them, have you all, these dormitories?

BLACK: Well, that's good enough. [Laughter]

BOLLING: Seventy of those to house people, and I didn't have a place to sleep. There wasn't any motels back then. They had just a few dotted along. There wasn't any four-lane highways even around Knoxville, except right in Knoxville. That's what frightened me so bad, that when I came in, there was such a crowd of people in Knoxville. I never had seen such a crowd in all my life, and I came in on Magnolia Avenue, and there's four lanes of traffic, and they had a streetcar line here. I was an old country boy. [Laughter] I never had seen that, and all four lanes were filled with cars. So I was so excited about it, I just parked my car, and I told about it in the book, I believe. I walked about three miles in there. Soldiers were everywhere, you know, at stoplights. And I was afraid of the traffic.

So I had to sleep, the first night, I believe it was, well, I finally found a place to sleep at a lady--she was giving massages. Not like they do today. [Laughter] But she was really into the business, and she had the sign up: "Massages and Room." She was a German lady. Finally, I walked about three miles back to my car, and it was about ten o'clock at night. In desperation, I saw the sign "Rooms and Massages," and so I pecked on the door. No, I rang the bell. And a Germanic woman came to the door, and she said, "I have no rooms, but you can have my cot, my massage cot, after I get through with it, for a dollar."

So I went down to the basement, followed her down there to the basement, and I waited there behind a screen 'til she pummelled her last person there and rubbed 'em down, and then I got the bed.

01:58:04:00 [Bolling reads from letters that he had sent his wife]

Next night or two or three--well, for about three weeks, I had to sleep in my car. I wrote to my wife, but she couldn't write me for a while, and then they established a good post office there at Oak Ridge. And this is what I wrote her. "1943." I squirreled away these--my wife

squirreled them away. I wouldn't have kept 'em, but she did. And all letters that I wrote were marked--if you can focus in on that--it's Knoxville. We didn't have Oak Ridge. Knoxville. This is what I say to her in one of my letters here: "Well, I'm still living, but kind of tough. I sure have fixed the car so that I can sleep in it. I wrote you this morning about it, but I'm writing you again tonight while I'm waiting for something to eat. Boy, they will rob you around here if you don't watch out. Seems as though everybody is just watching for a chance to snare something from you. I just go to classes all day from 7:45 until 4:45, and. . . "

BLACK: Censored.

01:59:32:00 [Bolling continues to read from the letter]
 BOLLING: Got a lot of stuff. We were having classes one time, and this is what I wrote her in this letter about, "A man took an epileptic fit in class today. Boy, did it disturb us. Our instructor was so rattled. The victim screamed like a wild Indian and rolled and kicked. It took four men to carry him away. I have my application in for some gasoline, but I'll have to haul workers if I get any. I may get around it, though. In fact, I know I will. I don't sleep in my car this night, but tonight I don't sleep in my car in the area, but I drive over to Clinton, a town about as big as Coburn"--that's the place I came from. "It's about as big as Coburn. I drove over there and I slept in my car next to Magnet Mills," because it was getting pretty cold in weather, and I was sheltered, you know, behind this factory over at Clinton. And I've got a lot of stuff through here. It'd fill up a book to read it.

GOLDBERG: Maybe you ought to.

BOLLING: No.

02:01:06:00

GOLDBERG: Did your wife ever come to Oak Ridge during that period?

BOLLING: Yes, yes. People kept on to the personnel there in Y-12. They had a housing office right in the plant there at Y-12, and you had to stand in line a lot of times to get in there to see about your house and trying to get a house. So I waited about three months or more, and finally, everybody was going and talking to this housing man to try to get a house. Finally, I told the man that if I didn't get a house, "I'm going back to teaching." Well, the next two or three days from that, why, I got a notice to come to the housing office, and he had a house for me. They sent a truck to Virginia, at Coburn, Virginia, to get my things, get our household goods, and the truck backed up to the door, and my wife didn't know she was going to move.

BLACK: You forgot to write her? [Laughter]

BOLLING: Didn't have time! They had my record and said, "We'll move you here." So they made a quick job of it. And there wasn't any phone to call. Wasn't any phones in Oak Ridge then. I couldn't have called her. I tried to send her a telegram, finally. She was all crying about it and didn't know what to do. Finally, her brother lived there in Coburn, and he helped her become reconciled and told her to go on and ride in the truck with it, with the truck driver.
[Laughter]

But that was the way it was. I finally got word to her that she didn't have to ride in the truck. We got mixed up. The house I was getting had a range and it had a refrigerator, and we only had--let's see--we had an electric stove at home.

GOLDBERG: You had an electric stove at home?

BOLLING: At home. But she didn't know whether to bring it or not, and we got all mixed up about that. I forget just how it was, but anyway, they moved us. We stayed up at Virginia, at Coburn, for about a week. The company just paid me and said, "Go on up there. We'll pay for moving you and give you gas to go up there." And I was on the payroll while I was up in Virginia. The truck brought our household goods and put it in this two-bedroom, and we came in about three days later, and everything was set up--beds and everything. Everything was set up, and coal was in the bin. We were very happy whenever we got moved in '44.

02:05:06:00

GOLDBERG: Where did you live?

BLACK: Well, when I first came, we lived in Happy Valley, and that's the construction camp. It was J.A. Jones' construction camp, right in the shadow of K-25. There were about 12,000 people that lived out in this construction camp, and there were no telephones. If you wanted to use the telephone, you had to go to the office, and if you got a telephone call, they'd call out over the loudspeaker and say, "You got a phone call," and everybody would freeze, "Oh, my brother's overseas!" "Oh, somebody died." Because you just didn't use the phone.

So we got a double trailer for nine people. We moved from a two-story house in Nashville to a double trailer in K- 25.

GOLDBERG: When you say "we," who?

BLACK: My mother and father and eight brothers and sisters. I was the ninth child. The tenth child was fighting in the Army overseas. That's why we came to Oak Ridge--to win the war, to bring him home. And Mother set up her little service flag in the window as soon as she came in, and she told the children, "It's going to be like camping out."

My mother had never worked before, but she went down and got a job. My father worked at J.A. Jones, and I worked at Ford, Bacon & Davis, and Mother worked at Carbide, and we worked shifts. We had to rotate, because there were only four beds in the double trailer. A double trailer was like two trailers with a double bed at each end and the kitchen in the middle. Of course, every house and every trailer had blackout drapes, because people were sleeping around the clock. It rained every afternoon, just as I started to work, and I'd always lose a shoe or something, and we'd finally get to work. And then when I got off from work, there was a station wagon that would bring me home, but it was hard to find my trailer in the night. [Laughter] They all looked just alike, you know, and I'd spot Mother's service flag in the window and know that's where I lived.

There was a Wheat School up there for my younger brothers and sisters.

GOLDBERG: Wheat, Tennessee. The town of Wheat, Tennessee?

02:07:02:00

BLACK: The town of Wheat. But the old Wheat School was used for training the employees. The new Wheat School was just a building they threw up because they had all these children. But it wouldn't accommodate the children; there were three children for every desk. My little sisters would come home, "Oh, we had so much fun today! There were three sitting in our desk, so the teacher would put some butcher paper down the hall and say, 'Oh, why don't you draw some pyramids today?'" And they would draw. She inspected their fingernails and tell 'em to be sure and wash their hands and all that stuff, because in the trailer, the bath houses were about a block away. By the time you walked there, got your shower, and walked back, you were dirty or muddy or whatever. [Laughter] So that was life.

GOLDBERG: So you didn't start out working at K-25.

BLACK: Yes, I worked at K-25. My father worked for J.A. Jones. That's how we could get the house.

GOLDBERG: J.A. Jones is the construction company that built. . .

BLACK: The construction company that was building K-25. But you know, it was right there. Ford, Bacon & Davis, it was within walking distance. Happy Valley was a little town all of its own. Some of the people who lived in Happy Valley didn't know about Oak Ridge, because it was far into town, you had to get a bus to go in there. But we had our own library. They'd bring out the little rolling library out to this camp, and they brought out a rolling store, where you could buy your groceries. But we also had a bowling alley and a theater and a post office right in Happy Valley. But there were signs just like there were in Oak Ridge, you know, of "What you do here, what you see here, when you leave here, let it stay here." You were not to tell what you were doing; you were not to tell how many people were working there. And if somebody asked you, "How many people are working where you are?" you'd tell 'em, "About half of 'em." You just never would give a serious answer, you know. You couldn't.

02:09:00:00

GOLDBERG: Where were you living, Jane?

LARSON: I was living in a "B" house. We felt quite honored to have a "B" house. My husband's mother lived with us, so that we were eligible for one. But we felt very sorry--we were young and felt very sorry for particularly the GIs who were often lonely, and so we would take them in. We had sometimes a spare room when my mother-in-law was in Baltimore, or we had two couches in the living room, which we used. We had a succession of boarders. Twice they got married in midstream, and so we would have a ceremony or a party or something for this couple, and then we'd have two boarders instead of one.

I was working part-time for the Oak Ridge Journal. I was doing some columns for them, and one of the GIs was Dick Gamon, who became the editor-in-chief later. So we got in on a lot of the early history of the Oak Ridge Journal when Fran Gates was the editor-in-chief. She was a war widow, and we were very conscious of doing it the hard way. Most of the writing for the Journal was done by WACs [Women's Army Auxiliary Corps], who were employed as the stenographers and journalists. So it was exciting, because we watched everything building. I did the first theater reviews for the Little Theater. You know, it was really quite exciting to watch them start up from nothing.

02:10:52:00

BLACK: And the newspaper was free, wasn't it?

LARSON: Yes, it was.

BLACK: To the people in Oak Ridge. And you were not allowed to take it off the area. They called everything "the area." And you could read it, but you couldn't mail it home. I don't know why, because it didn't have any news in it. I'm sorry. [Laughter] I mean, it told about the dances, when they were going to have dances, and the ball games and the shift picnics and things like that, the dog bites, forty a month. It seems like everybody in Oak Ridge had a dog. But I mean, as far as national news or Oak Ridge news, it didn't have it.

LARSON: It really didn't have much. Well, it started, really, as a sheet to inform the workers where they could get services and get some entertainment, recreation.

BLACK: That was good for that.

02:11:40:00

GOLDBERG: Where were you living?

LIVINGSTON: Well, my father was in the [United States] Navy, and then he got sick and came home and started working at the Bureau of Mines, and we had to move from Knoxville to Birmingham, Alabama. And I hated it. My sister and her husband lived in Oak Ridge and had since '43, and they had two small children. So I came up to help there and found Oak Ridge a much more exciting place than Birmingham, Alabama. [Laughter] I stayed with her for a while, and I don't remember how it came about that I got a job, but I did. But I did it secretly. After three months, my folks kept saying, "Well, it's about time to come home, isn't it?" [Laughter] And, "A little longer, a little longer." And finally, I had to tell.

GOLDBERG: How old were you then?

LIVINGSTON: I started at eighteen. I was eighteen or so. Finally, I wrote and said, not "I have a job," but, "Could I get a job, please?" [Laughter] I got a one-word letter back from my father; it said, "No!" [Laughter] And outside of Oak Ridge, it was the project. All he knew was a big construction project and a rough crowd, and he didn't want his daughter out in that atmosphere.

So I took that letter to my foreman and showed it to him. He said, "Would you like me to write a letter to your father? I think I know his concerns." And so he wrote and said most of the people I worked with were college-educated people and very nice, and how important the job was to the war effort and so on. I went home for the weekend, and there were a few tears and so on. [Laughter] He relented. [Laughter]

I did live in a "B" house with my sister and her two children and husband for a while.

02:13:58:00

GOLDBERG: What about things like shopping? Were there supermarkets? Was there plenty of food?

LARSON: There was one store at first. We would queue up.

LIVINGSTON: In lines. [Laughter]

LARSON: Lines. To try to get meat, which was rationed. One of the things we were talking about earlier was the oleo [margarine]. At that time it was against the law to have colored, you know, yellow, butter-colored oleo, and we had to buy it by the pound, and it looked like Crisco. It was awful-looking. At first it was a packet of powdered granules that were yellow, and you'd mash it into this dye. And then later they got the trick of having a little pouch of liquid which was much easier. You'd break the pouch, and then you could squeeze this plastic bag that had the oleo in it. It was pretty rough. But that's the way we did it.

LIVINGSTON: One of my trips home, my mother sent my sister, by me, in my little overnight bag, some sugar and shortening.

LARSON: Precious!

LIVINGSTON: I somehow or other got separated from that bag in Knoxville, but I called. Yes, they had it. And so I went racing over there to get it, and when I got there, someone said, "What's in it?" [Laughter] And I made the mistake of saying, and when I went there, no bag.

BLACK: Oak Ridge did have a scarcity of many things, and you had to stand in line. Whenever you saw a line, you got in it. You didn't know what was the end of the line, but it was either soap or maybe Jello. We couldn't wait for the Jello to come in, because sugar was rationed, and you know, you couldn't make a cake very often, but you could have the Jello and have something sweet.

02:15:50:00

GOLDBERG: So just like the rest of the country, you had ration stamps?

BLACK: Exactly.

GOLDBERG: Red and blue. . .

LARSON: And because there were no stores particularly, it was even harder than the rest of the country, I think, at least in the beginning. We were all watching to see that second grocery store go up. And if we had company, it was really a scramble to try to figure out--we used to have black bean soup. I can remember that. I always thought that was kind of festive, because I could put a slice of lemon on top and it looked dressy. [Laughter] But that's what we would have if we had company.

02:16:24:00

GOLDBERG: Before we stop, let's turn for a minute to the end of the war. How did you find out--I'm sure each of you remember where you were when it was announced what it was you were doing. Do you remember that? I'll be surprised if you don't remember that.

BOLLING: I knew. I know where I was when it was dropped, the bomb was dropped.

GOLDBERG: What happened?

BOLLING: Well, I was at the Y-12 plant, and I was a supervisor over one of the tracks and the operators and the handlers and all. It came in, I believe, announced it on the loudspeaker. I believe they did. It could have been a phone call from Oak Ridge. And it was about ten o'clock, as I remember. I believe it was ten

o'clock. Anyway, I was on the evening shift. All of my operators from the cubicle room, they just left their cubicles running. They left the calutrons, handlers, they all ganged out, "They dropped the bomb! We made the bomb!" And they were just hooping it up out there in the middle of that big--on that top floor. Even the heater operators came up, and the vacuum operators came up. They heard about it. Everybody just had a great time, and they left those machines running! Very sensitive machines running! They'd kick off and they stayed off. Some went on to the change house even. Some of 'em clocked out! I stayed. I believe I stayed 'til the end, 'til eleven o'clock. I couldn't call home to see what was going on, couldn't tell my wife, but I think she heard it on the radio.

Anyway, at eleven o'clock, when I left, the roads were clogged all the way into the Jackson Square. It wasn't called Jackson Square then, just called town site, wasn't it? town site. And Lafayette Drive wasn't in there, just a two-land drive, and it was clogged with cars coming toward town site, Jackson Square. I made it to my home in East Village, and I told my wife, "They're having a big celebration." That's what we heard they were having, a celebration up to the town site. By the time we got up there, the road was so heavily clogged with cars and people that we just parked way down on Tennessee Avenue and had to walk the rest of the way up to town site. We got up there about 12:00 o'clock, and the CBS News and NBC News cameras, they had their lights on us. The crowd, the whole place in there around town site or Jackson Square was full of people, and reporters were there interviewing, talking to people.

GOLDBERG: They didn't have televisions, did they?

BOLLING: Oh, no. No televisions.

GOLDBERG: NBC and CBS cameras.

BOLLING: Cameras. They were news.

GOLDBERG: Movie news.

BOLLING: Movie news. They didn't have television. We bought our first television in '50, '51, I believe.

So we celebrated there, and I celebrated. Oh, I was thinking we caused the--we called them Japs. But in about a week, whenever I digested all of the news that the bomb had killed-- what was it?--60,000 people.

GOLDBERG: Eighty-thousand.

BOLLING: Eighty-thousand, women, children. I had a gut feeling that--I never have gotten rid of it. It's still there. I hated it. I hated it.

LARSON: I think we all did. I think everybody. . .

LIVINGSTON: Yes, it's a mixed. . .

LARSON: But on the other hand, we knew that if we hadn't dropped it, it would have been far worse.

02:21:10:00

LIVINGSTON: My brother had just come home for the first time from the South Pacific where he had had so many close calls, and so that meant to us, "Well, maybe he doesn't have to go back."

LARSON: Might not have to go back.

LIVINGSTON: My family was in Oak Ridge, and we were all together because he was home, and we just sort of laughed and cried.

02:21:41:00

LARSON: Yes. And when my father--I saw him briefly after he came back from Japan, and he said that they had planned, of course, an invasion of Japan, of our forces, which would have meant all of our fighting men would have gone into the island. And he said that when he got there, it was very clear that every single cove and shore space was fully armored with hidden weapons and kamikaze-- they had these little fields that were right next to the ocean, and there was a plane in every single field that was all ready to take off and clobber us.

GOLDBERG: He went to Japan?

LARSON: Just after the bomb fell. He was asked by General [Leslie Richard] Groves to volunteer with some men to go in and see if it was safe for the Army to land. They didn't know, really, if they could go in anywhere near Hiroshima, and so he went.

LIVINGSTON: And you said he was a doctor.

LARSON: Oh, yes, he was a medical doctor. He was a radiologist, actually.

GOLDBERG: He had been working here during the war?

LARSON: Well, he was the chief medical officer for the Manhattan District, which meant he worked directly under Groves. You know, his home was in Oak Ridge. He and my mother and my two brothers came down in December of '43 and lived there throughout the war, but Dad was gone most of the time, because he had to see to radiation safety and other kinds of safety, hospitals and so on, the building of--and the safe water supplies, and even the swimming pool, he had a hand in being sure that was healthy. But then when the bomb was dropped, then he really had to go and see just how much radiation had

lingered on and what it would do to people who wanted to go in there. He was really shaken by the all-out obsession the Japanese had with defending their island. And if we hadn't dropped the bomb, we would have had to invade them in order to end the war, and that would have been an absolute disaster, I think worse than anything. I think it's definitely known or concluded that that would have been much worse.

02:24:07:00

GOLDBERG: So first, did you all have the same experience that Connie reports, that first there was this sort of elation that you finally knew what it was you'd been working on?

LARSON: Well, I could report one thing that happened in the labs where the research arm of the thing was, you know. The chemists had to do a lot of research, not on the D's, the way the physicists did, but on trying to get the product out of the pockets and then purified again and machined and all the rest of it. So when the news came in, it seems to me it was around 10:00 in the morning that we kind of heard in the laboratories, and it soon became known that this was--the head of the division, who later became my husband--his comment immediately was, "Well, did it go off?" And that sort of took care of us for the day, you know. [Laughter] Everybody--that was the concern of those men, that it was dropped, but did it work.

BOLLING: Since it's been so long ago, you just can't remember those exact times and so on.

LARSON: It's hard to.

BOLLING: I remember where I was, and seems as though it was near eleven o'clock at night. Now, it could have been different, but that length of time, your memory--I do remember I was at the plant.

02:25:24:00

BLACK: I was at the plant, too, and I remember when I came out the gates, rumor had it around the area that the bomb had been dropped. We were so excited, we couldn't wait to read about it. We went outside the gates, and the Journal or the Sentinel was there, and the five-cent papers were going for a dollar. We were trying to get a paper so we could read, "What is this that we've done?" And you know, they were just running out of papers. There was dancing on the tennis court that night. I wasn't married, and my husband never did dance, but we went on the tennis courts and we danced. And the scientists were running around town, shouting, "Uranium! Atomic!" All these things that they had never been able to say before, they were shouting out like dirty words.

GOLDBERG: I'll show you the last picture, probably, for the night. It has it all in it, I guess. Let me put it up here. It's the big headline that the war ends.

BLACK: That was later, a couple of days.

02:26:23:00 [Close-up of photo of newspaper front page headline]
 GOLDBERG: But the others: "Devastating Atomic Bomb Turned on Japan," etc., etc., Chatanooga Daily News. "Our Secret Weapon." Really, I mean, there was that initial elation of knowing what it was that you'd been working on.

LARSON: Yes, it was a real. . .

BLACK: Did the Oak Ridge Journal report it? [Laughter]

LARSON: I'm sure they did.

LIVINGSTON: I don't recall. It's my age, maybe, I don't know, but that's all I can recall.

GOLDBERG: But then I guess this reaction was pretty ultimate weapon, I guess?

LARSON: Yes. You know, some of the scientists got very concerned about it, and we wanted to be sure it was controlled properly, and they worked to have civilian control rather than military control.

02:27:20:00

GOLDBERG: How long after the war ended--the character of the town must have been changed. Or maybe it didn't. When did the character of the town change from being sort of an Army camp in a way and controlled by the Army to being the kind of city that it is now?

LARSON: Well, I think rather rapidly after peace was declared.

BOLLING: In '56, when they sold us the houses, the Cemesto homes that we lived in, then we realized.

BLACK: But people started leaving, like you said. Some, when they heard the bomb was dropped, they left. They said, "I'm going home. My husband will be coming home soon." They left, and they knew that it was over, although we kept getting little memos in the plant, "Stay on the job," you know, "Don't leave, don't talk, don't tell what you're doing." Do you remember that? We were told to stay on the job.

LARSON: Is that right?

BLACK: Yes. At K-25, yeah, we were.

LARSON: Of course, K-25 was in a much better position than Y-12, because, really, our process was over. Alpha was sort of dead by the end of the war.

BOLLING: It was over.

LARSON: As you said, it was over, whereas K-25 was just getting into its stride.

BLACK: Well, we were told to stay on the job, so we did.
[Laughter]

GOLDBERG: It wasn't until--you said before, 1949, that the . . .

BOLLING: Gate opened.

GOLDBERG: The gate opened. The gate around the whole. . .

02:28:39:00

BOLLING: Around the city. The seven gates. We had a great celebration. Movie actresses and actors were here, and Vice President [Alben William] Barkley was here. I remember trying to make a movie of him. I made a movie of him making a speech on Blankenship Field there on the ball field. But I just held it up this a way and made a movie of him, and I have that today. I have a movie of the gate opening then. Alice Lyman, she was--let's see--she was training, she was teaching in the high school, training the band, and it shows her and her band marching down--it's not Oak Ridge Turnpike then, but it was a two lane. It shows here. And I don't know, Rod Cameron, the great Cowboy actor.

BLACK: "The Body," Marie McDonald.

- BOLLING: Alben Barkley, Vice President, was there speaking, and "the body."
- BLACK: Marie McDonald.
- BOLLING: Marie McDonald.
- BLACK: Adolph Menjou.
- BOLLING: Adolph Menjou. Anyway. . .
- BLACK: That was good. And it opened up the city, but it didn't open up the plants. I mean, they let us out. [Laughter] But you know, they wouldn't let anyone into the plants. Everything was still a secret then.
- BOLLING: But many people were disappointed. I was. I wished the gates had stayed closed to keep out a lot of the riff-raff, you know.
- BLACK: We had to start locking our doors.
- BOLLING: We had to do that, start locking our doors.
- BLACK: We had door-to-door salesmen that we'd never had before, magazine salesmen.
- 02:30:28:00
- LIVINGSTON: In some ways, Oak Ridge has remained isolated, sort of. There's been a Knoxville and an Oak Ridge. There's a lot more mixing and intermingling, but there's the project folk and there's the hillbillies. [Laughter]
- LARSON: It does have a special character, Oak Ridge does.

- GOLDBERG: A lot of people stayed, I guess, didn't they? I mean, a lot of people came back later.
- LARSON: Both, yes. But there was a lot of dissatisfaction, I think, for a number of years when we couldn't own our houses, and we weren't at war any longer. You couldn't figure out why you had to be coddled, essentially, by the Army. I mean, they supplied the electricity and the coal and painted the houses when, I think, everybody was quite ready to take care of it themselves.
- BLACK: But the trailers were shipped off to universities, because the GIs came home, and they wanted to go back to school. So they sent them to the University of Illinois, all around the country.
- GOLDBERG: And then you moved into a house? Is that what happened?
- BLACK: [Laughter] Yes, uh-huh. Could move into a house then.
- GOLDBERG: It was not until 1956 that. . .
- BOLLING: In '56, 1956, they sold us our--I had moved to a "B" house by that time, and there were more in '56. I moved to the "B" house, two-bedroom. They sold me the house for \$3,200. And today that "B" house sells for--what now?--\$40,000. It's been renovated and it sells. They're selling it for about \$40,000, and you can't see any Cemesto. It's covered over with aluminum siding, got a new roof on it. You would never know that it had been a Cemesto. But we became--there was a great transition period over between the gate opening time in '49 and by the time we became incorporated. We voted on it, whether to be incorporated, and it failed. We had a great turmoil of

turning Oak Ridge into a city, and that's a long story. But finally, they did, and that's a great, great thing.

BLACK: And we lived happily ever after, didn't we?
 [Laughter]

GOLDBERG: Very good. On that note, I think let's call a halt.
 Thank you very much. This was very, very nice.

BOLLING: Somebody one hundred years from today might see that
 video, mightn't they?

GOLDBERG: Oh, yes. We think it will last that long. We're not
 sure. That's one of the things we want to find out.

BOLLING: Get it in the right air-conditioning.

LARSON: The way technology is changing, even the film lasts--
 you might not have equipment to view it with.

GOLDBERG: Well, they'll put it on video disk.

02:32:52:00 [End of interview]

[End of VHS Tape 1 of 1]

[End of U-Matic Tape 2 of 2]

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