

**Nevada Test Site Oral History Project**  
**University of Nevada, Las Vegas**

**Interview with**  
**Pauline Silvia**  
**with Raymond Harbert**

**October 20, 2005**  
**Las Vegas, Nevada**

Interview Conducted By  
Mary Palevsky

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## Interview with Pauline Silvia and Raymond Harbert

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## Interview with Pauline Silvia and Raymond Harbert

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**Mary Palevsky:** *You were at the forefront of that.*

**Raymond Harbert:** The threat of them is going to be here for untold eons. You know what's going on in North Korea right now. But in a way it was almost a cultural shock, coming out of World War II and that type of environment and then, the end of World War II was Hiroshima and Nagasaki. And you go on to college and you get to be a part of it. And they sloughed off, really, considerations of radiation.

**Pauline Silvia:** Human responsibility.

**Raymond Harbert:** I remember one of the first lectures I sat in on, they said that the human system will slough it off, it won't do permanent damage, and they cited things like X-rays, look at all the people who got X-rays and nothing happened to them. Right now, you're beginning to see in Chernobyl some of the reaction to overexposure, and of course the *Fortunate Dragon* was another one of them. And there's a program right now on it, Department of Labor to reimburse test veterans and people who worked around nuclear material for things that have happened to them. Like that fellow that worked for me and he obviously suffered from the results of it. And in my ignorance and stupidity, I wrote a letter that I really was not qualified to write.

**Pauline Silvia:** I think that's an interesting point that you brought up. I didn't hear you say that before but you're saying this now, that you wrote a letter based on your experience and your expectations without the reality, the facts, that you weren't qualified. They were asking the wrong person to write the letter.

**Raymond Harbert:** Not the reality. That's right. All I could do is tell them what happened.

**Pauline Silvia:** Precisely.

**Raymond Harbert:** The exposed—I mean we did this and as a result of that, we were exposed. But the consequences of it, I'm not qualified to answer at all. I realize now.

**Pauline Silvia:** Yes. And they would—and even if you had given a qualification, chances are pretty good they would've asked you to change it.

**Raymond Harbert:** There was, in Honolulu [Hawaii], when I was running the office there in 1972, one of the fellows that worked with me out at Bikini, a native Hawaiian, was in Queens Hospital there, and he was dying; I went and saw him. He was dying of cancer. And I'm sure that it was caused by this radiation. He'd been down on Johnston Island and Bikini. He was there on Bikini with me. I remember seeing him. He was offloading some of the ships when they came in. But I don't think we really have a total grasp on it yet. We're just touching the surface of—see, they said you could be, as an example, every day we're exposed to radiation from the sun, a certain amount of radiation, and we throw that off. That's what the human body does. But once you pass a threshold where the body is being bombarded by more than it can handle, then is when we run into problems.

**Pauline Silvia:** That was one of the things in our studies that we, in the biomed studies that we found out, that we came to the realization that we were dealing with total dose received.

**[00:05:00]** One of the realities that we arrived at was the fact that yes, the total dose is significant, but what is much more important, much more significant is the force behind it, such as X-number of roentgens of X-ray; you had to know what the KVP, the kilovoltage peak was behind the delivery of that, and if you raised or decreased that KVP with the same dosage, you got a different result. That's when we got into the study of fast neutrons versus slow neutrons, so that there was an inkling at that time of the biological changes that can occur, and these were the

result of our studies in [Operation] Upshot-Knothole, and then we replicated these studies at the University of California on the cyclotron. So that what you're saying makes sense to me, listening to you talk about this, because I'm nodding my head and saying, yeah, that's right. And could I go to Rongelap with you, go back to there? I had some questions about that.

**Raymond Harbert:** Yeah. Sure.

**Pauline Silvia:** You mentioned—I don't know if I'm saying it correctly; my Rhode Island accent will come in. Rongelap—if I said—

**Raymond Harbert:** Rongelap. R-O-N-G-E-L-A-P.

**Pauline Silvia:** All right, then what you said, OK. But when you talked about I believe it was March of 1954—

**Raymond Harbert:** Yes, was when that shot was fired.

**Pauline Silvia:** I was in San Francisco at that time, at the Naval Radiological Defense Laboratory and I was engaged in thermal injury studies. But one day we received notice that we had some animals coming in, and we got two pigs, a dog, and a chicken from the island, Rongelap. And we were to study them, using the parameters that we had used in Upshot-Knothole to study these animals. And we did, and obviously they had radiation illness. There was no question about it. So that kind of, when you were talking about it, I was on the other end receiving some of those animals that you were talking about. And we did study them and found out that there was radiation illness within these animals.

**Raymond Harbert:** You know, the level of radiation is obviously dying down. One of the things that puzzled me, you take Bikini lagoon. OK. They had the Able-Baker shots there in 1946 which the [United States] Navy conducted and those ships sank out there. We went in there and then fired these megaton shots and really tore up part of the atoll and left a lot of radiation

there in that lagoon. Now the University of Washington Fisheries Department had been doing a lot of study on those fish. They had been going out and catching them and taking them up to Seattle [Washington] and running some analysis on them. But that's just touching the surface of what knowledge we should be getting. I think, the type of work that you performed is invaluable.

**Pauline Silvia:** See, part of my question, and I keep thinking this over and listening to you that, I think part of my problem is that I never asked the questions soon enough to find out; my concern was, what did they do with the data that we collected and why did they put those foot soldiers in the trenches when we already knew out of the first shot what was going to be happening, and that question came up and I think I sort of—I dropped that responsibility to continue, and I'm still asking the question and I don't know.

**Raymond Harbert:** I don't know either. I was there when they were in the trenches and they [00:10:00] came out. I've actually gone into ground zero, the first person into ground zero afterwards. There in Frenchman's Flat we built some civil effects test group work. There's an underground garage, there's some domes made by American Machine and Foundry, designed by them, there's other structures, and we went in and wrote our evaluation right afterwards. We put on booties and went in.

There in Area 7, we took some asphalt and mixed boron in it. Boron is a neutron absorber. And we put this 400-foot-by-400-foot asphalt slab there to see whether there would be substantial absorption of those neutrons. So right after the shot, I went in there and took some Geiger counters and a couple of the guys went with me. And we set up a grid and then would go across there and mark down the readings on the meter so that we got a profile, a cross-section profile that looks like this. In the center, very little radiation, but out on the edge you got both shine and you got direct radiation. And of course we're looking at that type of experiment.

Later in Plowshare, one of the things that we did there was we worked with Baroid [Industrial Drilling Products]. And when you have an underground shot and you have a drill hole and you're putting a device down it, in case it doesn't go off you have to be able to recover it. So what we were interested in, we had to simulate the overburden, so we had to beef it up, beef up a stemming fluid, so we used galena, which is lead ore, and mixed that in with it and poured it, but it was still pumpable. And we put boron in there to help absorb any radiation. So that was a direct fallout out of what we did at Nevada. And that was for a program in Alaska.

By its very nature, though, you go through a series of tests and experiment and evaluation, and then from that you've learned something and you move to the next level. Our nation went too abruptly from radiation as an X-ray tool to the reality of radiation that we get through nuclear detonation.

**Pauline Silvia:** Neutron radiation. Exactly.

**Raymond Harbert:** And the risk that exists from nuclear power plants. I believe in nuclear power plants.

**Pauline Silvia:** So do I.

**Raymond Harbert:** But you got to make them safe.

**Pauline Silvia:** Exactly.

**Raymond Harbert:** And you have to build redundancy in because you can't trust a human being.

**Pauline Silvia:** Exactly. And safety is not really a value in the United States. We're great risk-takers and so that safety, to me, is really not something that's valued.

**Raymond Harbert:** Can I speak to you of capitalism?

**Pauline Silvia:** Yes.



**Raymond Harbert:** I worked at Elk Hills Naval Petroleum Reserve, and up there, part of it we worked against OSHA [Occupational Safety and Health Administration] rules and regulations.

**Pauline Silvia:** It's interesting words you've used, "we worked against."

**Raymond Harbert:** I tried to work within them because that was my responsibility. But we would have to present our findings or our recommendations to a board of two men, one from Chevron, because Chevron owned 28 percent of the field, and the government owned the other 72 percent. And it was called the Operating Committee. We had some power plants out there, and we proposed to put in some safety factors. Chevron made the tradeoff between what a lawsuit would cost versus the cost of the safety; I got so—excuse me, I got so damn mad, it just—there is no equation.

**Pauline Silvia:** That's the way they think, and that thought process continues today as far as the lawsuit versus the actual reality.

**Raymond Harbert:** Yes.

**[00:15:00] Pauline Silvia:** Can I go back to your island experience with evacuating the people from the island?

**Raymond Harbert:** Sure can.

**Pauline Silvia:** One of the things when we were studying these animals that we received, we got a report back that the people who had been evacuated to another place, I wasn't sure where it was, but anyway they were having tremendous gastrointestinal problems. And being in the Biomedical Division, we would get that information, so then it sort of put out an alarm to us, we have to begin to monitor specifically the gastrointestinal system at this point. And it was not long after, I think maybe two or three days later, that we got the word back that the problem had

been solved. And you reminded me of it when you said that the islands had what I would think is domestic territorial lines, that there would be the lagoon side and there would be the reef side.

**Raymond Harbert:** That's right.

**Pauline Silvia:** And one of the things that they found out, the reason why the people were having gastrointestinal problems were because as a part of their cultural experience was that a certain time of the day, based on the tides, they would all go to the reef to defecate. And when they were moved, they did not have the reef that they could go to, to defecate and—

**Raymond Harbert:** That's right, because it was a single island.

**Pauline Silvia:** That's what was causing these gastrointestinal problems. And indoor plumbing was something foreign to them.

**Raymond Harbert:** It was foreign to them, that's right. When they designed the houses, I remember that coming out.

**Pauline Silvia:** Foreign to them, and that was one of the things that came out of it, that they said, don't bother, you don't have to continue the study, and we've identified what the problem was. Now there's a—we would've launched on this horrendous experiment trying to talk about gastrointestinal and it was because the reef was no longer there. I thought that when you were talking about that, it reminded me of that.

**Raymond Harbert:** But, you know, they lived an idyllic life. I often think I would've loved to live that type of life rather than the hectic one I've lived.

**Pauline Silvia:** Yes.

**Raymond Harbert:** But to completely be destroyed, for their whole concept, their culture to be essentially taken away from them; they're treated like they're robots, not like they're human beings with experience and likes and dislikes and a cultural imprint that is imprinted in their

brain from the day they're born. And they're shoved into this hurdy-gurdy world of the American. And we are so pompous in our belief that we have all the answers and that they emanate from the White House. Just tears me up.

**Pauline Silvia:** Let's not go there. That's a real red flag for me. But I concur with you 100 percent in what you've said. Of course, at the time when we received the animals, I had no frame of reference. All I knew was that they came from an island in the Pacific and the other implications of it. And it really struck home to me when they came with the notice about the gastrointestinal problems. And then when they told me what the solution to it was, it really hit me at that point, saying [to myself], Wow, where are we at and what are we doing with these people?

**Raymond Harbert:** Yeah. Down at the [Atomic Testing] museum, I've donated three pictures I took out there. There are two pictures here on the wall. But they were pictures of the governor [00:20:00] or chief's house on Rongelap and an outrigger at Majuro and there's one other. Their life—there wasn't any streetcar going down there. And their approach to life was so magnificent. I guess they had battles once in a while, territorial battles.

**Pauline Silvia:** I'm sure.

**Raymond Harbert:** But not like we know them today. Yes, I wish there was a little more concern about humanitarianism than there is. I think people are too concerned about the God-almighty dollar.

**Pauline Silvia:** One other comment I'd like to share with you about the museum. I went through it yesterday, Tuesday, I don't know when it was I went through it, and I kept looking for the human aspect; these were human beings that were there doing this, and I really feel that the museum doesn't take that into consideration at all.

**Raymond Harbert:** I agree. As you come out of the theater there, the Ground Zero Theater, over on the left there's a little display of a couple mannequins. OK. That dealt with the analysis. They had some houses out there, and you might've run across that, that were there and they wanted to see what would happen. There was a program called Civil Effects Test Group, and that was run by the [United States Army] Corps of Engineers, and it was one of the reasons for the facilities that we built out there in Frenchman's Flat: the underground garage, the domes and some of the other structures—and see how they would stand up under a nuclear, because you're talking about protecting our citizens. All you hear about, they've got that in a little tiny corner, but that was a major program conducted by the government. [Dwight D.] Eisenhower was concerned about it. [Harry S.] Truman was concerned about it and made sure it was an element of it. But the museum just touches on it. When they talk about Plowshare, there's a little plaque on the wall that says something about Plowshare, but that's the extent. To me, I was more excited about Plowshare than I was about the big shot, the Bravo shot in the Pacific, because here we're doing something for humanity. It was not destructive. It was to make a better world. And I really, I agree with you 100 percent that the human element is missing from the museum on that part, with possibly the exception of the movie that Al [O'Donnell] made where he expressed his feelings on his contribution that he was fighting the Cold War. But they just touch on Hiroshima and Nagasaki, and yet people are still suffering from that.

**Pauline Silvia:** Yes. When M.T. [Silvia] and I came back here maybe three or four years ago for a visit, we got to visit the [Nevada] test site and obviously it was nothing—very little that I remembered about it because it had changed from 1953. But the tour guide was going along and talking and he went to the houses, the remaining houses from '53 that were still standing, and he talked about that. And then it reminded me of it when I was in the museum, with the

mannequins. Nobody talked about the *thermal injuries*. Nobody talked about the [00:25:00] *radiation injuries*. And this was not in this gentleman's frame of reference as a tour guide out there. And then when I saw the mannequins in the museum again, there was nothing there to indicate that, well, there were—even though the house stood up, this one house remained and continues to be extremely radioactive, the persons living in those houses would have suffered *extreme* thermal injuries, as well as the radiation effects.

**Raymond Harbert:** That's right. Yes.

**Pauline Silvia:** And to me, that's a mortal sin that they've left that out.

**Raymond Harbert:** It is. I agree with you. I've commented on that. There's another aspect of it that they do not really stress in there, and that's the innovations that the test program itself developed. As an example, high-speed photography, which you saw. There is a display of that but it's short-lived. The advances in electronics that occurred because of the monitoring. Those have all gone on to benefit us in many ways, but it is not highlighted. The highlight is the destruction and the big bang.

**Pauline Silvia:** The big bang and the big hole. How big a hole can we make with this? That was the pivotal point of his tour.

**Raymond Harbert:** Well, the Sedan Crater is what you're talking about.

**Pauline Silvia:** I know. I wouldn't dignify them with the word of "crater." I'd call it a hole, because that's what it means to me. But, well, I guess everybody has a different point of view.

**Raymond Harbert:** That's true, but what I get out of it as being a docent is that I can add to their tour what is not on the walls.

**Pauline Silvia:** Wouldn't that be wonderful, if they could have a narrative, if each time they run a tour out there that had the narrative from you included. And maybe at where the mannequins are, using all of these inventions, if there was a little button you could push and they could hear your narrative, and at Plowshare, push another button and hear what your personal experience was. That's what you should get them to do.

**Raymond Harbert:** Well, I agree with you to a certain—well, I just try to fill in the gaps to them as best I can. You know, one of the interesting things, and you probably recall, when they were testing there in Frenchman Flat and in Yucca Flat, that people would go—there's a lookout point between Mount Charleston and Lee's Canyon. People used to go up there, and they're some thirty miles away from ground zero. But people got their eyes burned. People don't realize the intensity of that light when those devices go off.

**Pauline Silvia:** Well, my experience was, again when we went through the museum, there were pictures of people with these huge goggles on, et cetera. We didn't have goggles. We sat up there on the hill at either Frenchman Flats or Yucca Flats, at midnight and sat there all night long waiting; then at dawn we would sit down in a chain and hold on to each other because of the shock wave that was coming, and we would close our eyes and put our heads down. We didn't have the goggles. And the flash that you're talking about, even with your head down, and my first experience was—

**Raymond Harbert:** You could see right through your eyelids.

**Pauline Silvia:** Precisely. That's the best way to describe it. I'm saying to myself, is this the way it's supposed to be? And then they keep singing the mantra, "Heads down, heads down, eyes closed, heads down," and then eventually the shock wave would—you'd get the [00:30:00] thermal wave and then you got the shock wave and that's when you had to really hold onto each

other so you didn't get knocked over. And theoretically you were still supposed to be having your head down and your eyes closed, and then they would tell you.

**Raymond Harbert:** One of the things I try to do, when they go into the theater there, I take a group in there, I tell them how what happens administratively ahead of time. At four o'clock in the afternoon, we used to meet in Mercury, in the conference room there, and we would have presentations by the people who were familiar with the yield of the device, the weather people, and people who specialized in barometric pressures. And they would set off ahead of time some high explosives and make these recordings around the country to find out whether we're going to bust windows in Las Vegas or Los Angeles. So I run them through that. Then I would tell them that then at eleven o'clock we meet at the command post which sits between Yucca and Frenchman's Flat, and that we have another meeting and everything's updated based on the information we get primarily from the weather people and the latest explosions. And if the decision is made to go ahead, then they will start at three o'clock this automatic sequence timer. And at that point in time, things are on the countdown. There is a no-go button; they can interrupt it. But at the eleven o'clock meeting, the decision is made whether to have a T-party or not, and they called it a "T-party" because it was the tower. We would go and take the equipment away from the base of the tower so we could reuse it. And then of course at three o'clock in the morning when they would start the automatic sequence timer, we would bring the news people and observers out to Newsman's [News] Nob which sits there between Frenchman—

**Pauline Silvia:** See, that wasn't there when I was there.

**Raymond Harbert:** No, no, it wasn't. That was built later. In fact, one of the projects I had while I was there was building a road up there. Before that, they used to have to climb up there.

And so. But we'd bring them out and they would sit there and then they'd go back and they'd have a big breakfast for them and, you know.

**Pauline Silvia:** Public relations.

**Raymond Harbert:** And propaganda. Let's call it what it was.

**Pauline Silvia:** Yes. It was. Propaganda. No question about it.

**Raymond Harbert:** And that was all part of it. There are fond memories, but there's some sad memories that go along with them. There's what have we wrought on mankind.

**Pauline Silvia:** Precisely. Yes.

**Cameraman:** It's amazing, listening to you talk, both of you. It is.

**Pauline Silvia:** I was just so curious when you were talking about Rongelap and I knew about us—and you talk about the pig being sent to Washington, and that we did receive some of the animals. I'm sure some went elsewhere, too, to [Naval Hospital] Bethesda [Maryland] because Bethesda was actually our home affiliation, but we were the Naval Radiological Defense Laboratory in San Francisco. But when you were talking about that, I can remember the animals. And I shared this experience a couple of times in this session about when we got the chicken and we had to take blood samples from it. And we had this wonderful veterinarian, Colonel Veenstra, who came in and showed me how to take care of the chicken. And he said you take the chicken and put it under your left arm and hold it very close, and then put your finger right up to the chicken's eye, and make sure that the eye is focused, and you could see the eye would come in and focus immediately on your finger, and then very quickly gesture like that, and it put the [00:35:00] chicken in a trance so that we could then maneuver their wing so we could get some blood samples. And then once we were finished, we'd just shake the chicken up and it would run off.



**Raymond Harbert:** Well, you know, when I described what it was like after the shot [Bravo] went off and when we realized there was a major overyield, we had these picket ships out there which were destroyers, they sent one destroyer to Rongelap, and they used their landing craft from the destroyer to go onshore and bring the people on out. But to my knowledge, there was no briefing of the Rongelapese, even that there was going to be tests. God knows what, all of a sudden here's a warship shows up over the horizon and a bunch of [United States] Marines come in and say, We're going to take you to another island. We're going to resettle you. And with their non-knowledge of radiation, how are they going to react? They don't understand. They still didn't understand even when we talked to them later. We are ill-prepared to handle what we were unleashing.

**Pauline Silvia:** And to take responsibility for it.

**Raymond Harbert:** That's right. And we still don't.

**Pauline Silvia:** Absolute—no. No, we're still not responsible.

**Raymond Harbert:** No. No. It's sad in so many ways. We could've done such great things and we haven't.

**Pauline Silvia:** I don't think we ever will. I think that the circumstances are what they are.

**Raymond Harbert:** You think we're on the downside of history?

**Pauline Silvia:** I don't think that—I think we're on the side, a very difficult, even more complex side of history. I don't think it's necessarily—I don't think it could go down anymore than what it is, what we're talking about now, what's happening in the world today, et cetera, which I choose not to get into, but I have very strong feelings about it. But the word that is not in our vocabulary is "responsibility." That word is just not there. You can go and do anything you

want because you have the money, the power, whatever, but responsibility is not a part of the vocabulary. And that's where it's at.

**Raymond Harbert:** That's a great statement.

**Pauline Silvia:** That's where it's at. God gave us free will.

**Raymond Harbert:** That's right.

**Pauline Silvia:** And how we have abused it. Free will. The way in which we make our choices. But responsibility, that's not a part of our culture. You talked about culture. When they look back at this culture, they're going to say, they were not responsible people.

**Raymond Harbert:** Well, you look at the rise and fall of the Roman Empire, the British Empire, and I hope our nation isn't at the zenith, but it might be.

**Pauline Silvia:** I don't see that the end of the world is right around the corner—

**Raymond Harbert:** No, I don't see it that way, but I do see the rising power of China and the siphoning-off of the wealth of our nation. That does bother me. We're losing a lot of our economic power by outsourcing and so many other things. I just wonder if a lot of the things that [00:40:00] we do are really in the best interests of the nation, or if that's just a ploy for corporations to run the nation.

**Pauline Silvia:** Well, you know, the word that is dominant is "capitalism." I mean you pointed that out earlier, capitalism, it runs the world.

**Raymond Harbert:** True.

**Pauline Silvia:** Runs the world, and who's got the most money, those are the folks that are going to run the world.

**Raymond Harbert:** But if you siphon off our capital, the capital that we have, to China, what do we become? We become dependent on China.

**Pauline Silvia:** But, you see, it may be—it's siphoned off on an individual basis, people like you and I, if you will, if we were in the job market or a part of a group working, but it's not siphoning it off those that are the ones who are generating the money. That money is still there, and they're holding onto that and they're building that reserve. But the siphoning-off, when they siphon something off here and send it somewhere else, they've got more than a triple feedback for it in return. But I wonder—

**Raymond Harbert:** The individual.

**Pauline Silvia:** Yes. Exactly.

**Raymond Harbert:** But not the nation. There's a finite—

**Pauline Silvia:** A select few.

**Raymond Harbert:** But there's a finite amount. If you take the whole world capital, the United States has 40 percent of it or whatever it has. And if it continues to travel in the opposite direction instead of building up, it's going to diminish. The pot's going to continue—

**Pauline Silvia:** That makes a lot of sense. That makes a lot of sense. Yeah. The other thing that they really haven't explored is the oil reserves in China. You don't hear much discussion about that. From what I understand, they're just assuming there is no oil in China. But there's no exploration—

**Raymond Harbert:** There is oil.

**Pauline Silvia:** But there's no exploration or utilization.

[End of interview]