Rocky Flats Cold War Museum

Weapons to Wildlife

Summer 2009 Vol. 3 # 2 Newsletter for Friends of the Rocky Flats Cold War Museum

In this issue:

The Rocky Flats National Wildlife Refuge has a few cactus and yucca plants.

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Museum Board hires exhibit & curatorial consultants

At its June 10th meeting, the board of the Rocky Flats Cold War Museum board approved a contract with Musemaster, LLC, an Arvada museum consulting firm, for collection management and exhibit design services over the next year to prepare for an exhibit at the Arvada Center for the Arts and Humanities.

Jim Bert and Conny Bogaard of Musemaster, who both have extensive museum experience, will each work part-time over the next year to develop a database of the artifacts and to help develop five storylines into the planned exhibit which has been delayed from summer to the fall, 2010. The contract will total $36,925.

The curatorial project goals will include purchasing PastPerfect museum collections software and a computer to log and describe the museum's artifacts; identifying ways to incorporate the museum's oral histories into the exhibit design; working with the Arvada Center staff in selecting and preparing artifacts and other materials for the exhibit and assisting the board in determining the storage space, equipment and supplies needed for a new museum/visitor center. Bogaard hopes to find half a dozen knowledgeable Rocky Flats retirees who will volunteer to help identify and describe all the objects in the collection.

The exhibit design goals will include chairing the museum's Education Committee which is working on planning the exhibit and public program; refining the storylines and themes to help ensure a fair and balanced re-telling of the story of Rocky Flats and its role in the Cold War; developing text panels and wall labels, in cooperation with the Arvada Center, for installation of the exhibit; and working on identifying artifacts and collection items for use in the exhibit. Other goals are developing a final checklist of exhibition items; assisting in writing and producing a small exhibition catalogue for the exhibit; and assisting in fabricating and installing the exhibit infrastructure and components at the Arvada Center.

Jim Bert has been executive director of the Hotel de Paris Museum in Georgetown, CO, since 2005. He has 22 years of experience planning, developing and managing museums and has master's degrees in American history and in museum studies. Conny Bogaard was a curator at a museum in the Netherlands and now teaches art history and museum-related classes at area colleges.

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BOARD MEMBER BIO: *Jack Swanzy, architect*

Jack Swanzy, an architect and educational facilities planner with more than 40 years of experience, joined the Rocky Flats Cold War Museum board in 2006. The newly elected museum board vice president chairs the Governance Committee and initiated the board's first annual awards in late 2008.

He retired in 2005 from Jefferson County Public Schools after 13 years as Executive Director of Facility Planning and Design, where he planned and oversaw $1.4 billion in capital improvements for the school district. Swanzy was in private architectural practice for many years, 14 years in Swanzy Associates Architects and also in BTS Architectural Group. He designed primarily educational facilities. For Church Ranch Development, he designed Buildings 060 and 061 at the west entrance to Rocky Flats. They were used by the U.S. Department of Energy and its contractors for meetings and offices for years before closure of the site in 2005.

Swanzy was the recipient of the 2005 Council of Educational Facility Planners International's Southwest Regional Planner of the Year and was a finalist for the 2006 CEFPI International Planner of the Year. He has been a director and vice president of the American Institute of Architects, Awards Chairman of the Rocky Mountain Chapter of CEFPI, Director of QBS, Supervisory Committee member of the Jeffco Credit Union and on several non-profit development boards. He attended the University of Wyoming. The Wyoming native enjoys fly fishing and hunting in his spare time.

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Museum renamed…

Albuquerque atomic museum moved to new, larger facility

Originally known as the National Atomic Museum, the facility in Albuquerque, NM, has been renamed the National Museum of Nuclear Science and History and has moved and reopened in April in a new, larger building at 601 Eubank Blvd., SE, near Sandia Laboratories.

Established in 1969 on Kirtland Air Force Base before moving to Old Town Albuquerque, it is the nation's only Congressionally chartered museum of nuclear science and history, a place to learn the story of the Atomic Age, from early research of nuclear development through today's peaceful uses of nuclear technology. The new larger facility allowed the museum to expand its exhibits and programming. The new site has an extensive outdoor exhibit park displaying a B-29, F-105 jet, Redstone, Atomic Annie cannon and the James K. Polk submarine sails.

The museum's exhibits include:
* **The Uranium Cycle**, an exhibit that explains the processes used to process and dispose of uranium after use;
* **Energy Encounter** with interactive exhibits helping the visitor discover the place nuclear power has in our energy hungry world;
* **X-ray History**
* **Radiation 101**
* **Hiroshima and Nagasaki**

* **Cold War Fallout Shelter**
* **The Cold War**
* **Atomic Culture/Pop Culture**
* **Little Albert's Lab** for children to grasp the concepts of physics, the basis of all sciences
* **The Decision to Drop the World's First Atomic Bomb**
* **Pioneers of the Atom**.

For more information about the new museum see http://www.atomicmuseum.com.

Colorado Humanities grant supports Rocky Flats interviews

The Maria Rogers Oral History Program of Boulder Public Library's Carnegie Branch Library for Local History received a $3,000 grant to digitize and archive a set of 25 interviews conducted by LeRoy Moore, Ph.D., and Robert Del Tredici, of Rocky Flats workers, whistleblowers, scientists and engineers, organizers and activists. Moore, a long-time anti-nuclear activist with the Rocky Mountain Peace and Justice Center in Boulder, is on the board of the Rocky Flats Cold War Museum.

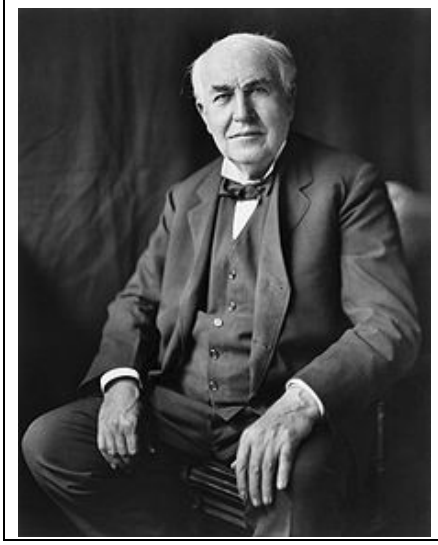
With an additional $2,000 from private donations, the project will preserve the audio from the 25 interviews and make them accessible via the internet in the library's online catalogue. The interviews will be available to the public by December 2009. In this audio collection, narrators voice ethical concerns about national security, conditions of secrecy and issues of public and environmental health.

"The donation is remarkable for its breadth of perspective and reflective content," said Susan Becker, the Oral History Program Manager at the Carnegie Branch. "These memories are extremely valuable, made more so by the inclusion of the voices of some individuals who have since died."

Cyns Nelson, who is overseeing the project's archiving tasks, said "I'm grateful that Colorado Humanities recognized our program and chose to fund this project. Personal narrative fuels people's imaginations. The act of listening moves people beyond awareness of history's events and toward meaningful engagement."

The Maria Rogers Oral History Program was created in 1976 and has more than 1,550 interviews. The oral history repository contains a special collection of 130-plus oral histories about the Rocky Flats Nuclear Weapons Plant. The museum will share the Rocky Flats interviews.

Visit www.boulderlibrary.org/oralhistory and click on special collections and then on Rocky Flats.



Quote…

"There will one day spring from the brain of science a machine or force so fearful in its potentialities, so absolutely terrifying, that even man, the fighter, who will dare torture and death in order to inflict torture and death, will be appalled, and so will abandon war forever."

Thomas Alva Edison (1847-1931) *1922, The Diary and Sundry Observations of Thomas Alva Edison,*2.3.10, ed. Dagobert D. Runes, 1948

News Briefs:

*** A special heart-felt thank you goes to the following donors to our museum:** Audrey E. Giovanini, Doris K. Scott, Thelma L. Downing, Viola T. Villano and Sue Levine of the Boulder Philharmonic Society (for office furniture). Jack Swanzy also donated a table.

*** Volunteers needed:** Want to help identify and describe Rocky Flats artifacts? Want to help develop exhibits? Email ajldenver@aol.com.

*** Welcome to new board members:** Ron Hellbusch, president of the board of the Friends of the Front Range Wildlife Refuges, and Stan Freiberg, former long-time Rocky Flats worker, have joined the board of the Rocky Flats Cold War Museum. Developer Charles Church McKay of Church Ranch has become an Honorary Board Member.

* **Board resignations:** Don Rohlf, Rocky Flats retiree and former museum board officer, resigned after years of working on the museum's development. Special thanks to Don for chairing the Collections Committee, serving as treasurer and providing significant help in moving the artifacts to the storage facility months ago. Jim Bert, executive director of the Hotel de Paris Museum in Georgetown, also resigned from the board months ago. We thank him for providing wise counsel and advice on museum policies and procedures, etc.

*** Presentation:** Board member Kim Grant gave a presentation about the museum June 10 to about 25 members of the local chapter of the Retired Federal Employees Association in Arvada.

*** Artifacts donated:** Don Ofte, former U.S. Department of Energy manager at Rocky Flats from late 1978-1982, donated the bumper sticker "Save Rocky Flats—move Denver" and two small rocks from a geological study that showed that Rocky Flats was in an earthquake zone. Ann Lockhart interviewed him for an oral history July 26.

*** Article & Radio interviews:** Hannah Nordhaus, Boulder freelance writer who did many of the Rocky Flats oral history interviews for the Rocky Flats Cold War Museum and Maria Rogers Oral History Program for the Boulder Public Library, wrote an article for the environmental publication *High Country News* called "Half-Life of Memory." She was interviewed March 20 on KCFR Radio's program "Colorado Matters" about the oral histories and various viewpoints of those interviewed. Nordhaus and board members Ann Lockhart and Shirley Garcia were all interviewed about Rocky Flats history and the museum more recently by Boulder's KGNU Radio.

Weapons to Wildlife

The *Weapons to Wildlife* newsletter is issued periodically by the Rocky Flats Cold War Museum board. In July 2001, the board incorporated as a 501(c) 3 organization to develop the museum to "document the historical, social, environmental and scientific aspects of Rocky Flats." We want to tell all sides of the Rocky Flats story.

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Rocky Flats Oral Histories: **www.boulderlibrary.org/oralhistory/** Click on special collections and click on Rocky Flats.
Email: **editor@rockyflatscoldwarmuseum.org** to be removed from or added to this newsletter distribution list.

Oral history excerpt: Dr. Lee Newman

Berylliosis diagnosed among Rocky Flats workers

Dorothy Ciarlo, Ph.D., interviewed Dr. Lee S. Newman (born in 1953) on Oct. 15, 2003 at National Jewish Medical and Research Center in Denver on his work with developing a test to diagnose beryllium sensitivity and beryllium disease among Rocky Flats workers for the Rocky Flats Cold War Museum and the Maria Rogers Oral History Program (Boulder Public Library). Click on www.boulderlibrary.org/oralhistory, then Special Collections, then Rocky Flats to read/listen to the full interview.

(Can you tell me, when and where were you born?) …I was born in 1953 in New York City…I was seeking the best training in pulmonary medicine…I…did three years of training in lung disease…at the University of Colorado, part…here at National Jewish…I'm a professor in the Department of Medicine and the Department of Preventive Medicine, over at the University of Colorado Health Sciences Center, and I'm a Professor here at National Jewish Medical and Research Center….I teach, I do research, I take care of patients.

(…we're doing…oral histories of people who have had some involvement with Rocky Flats, we've interviewed a lot of workers…trying to get the whole picture of what the Rocky Flats Nuclear Plant …history is all about. And one piece of that seems to be this disease called berylliosis.) …In 1984 I saw my first patient with…chronic beryllium disease, or berylliosis--it's all the same thing…a retired nuclear physicist who had worked with Fermi, during the Manhattan Project…a patient at National Jewish…

…I had a great interest in…occupational lung disease and…how our immune system attempts to repel or deal with foreign invaders. When we inhale things into our lungs, it requires the immune system to respond to the insult…I was trying to identify work I could do in immunology research and…occupational medicine…I went into the library here at National Jewish and came out…with the idea…that I would develop an animal model for studying how a particular kind of lung disease develops, it's called granulominus lung disease, and decided I would use beryllium and try to put it into mice as a way of developing an experimental understanding about how people develop immune system over-reactions.

Around that same time…Kathleen…Kay Kreiss, who ran a small occupational medicine group here…Dr. Kreiss said that she had gotten a call from the medical director at Rocky Flats…Lloyd Wright. Dr. Wright…said…a woman… working in a plutonium area…had become pregnant, so they had to pull her out of the radiation area…he wanted to know…whether …it would be safe for her to go to work in beryllium….Kay and I looked at each other and said, 'Beryllium? We didn't know they used beryllium at Rocky Flats'…Lloyd Wright laughed…and…said, 'Well, I think about 60% of the U.S. supply of beryllium is being used right now at Rocky Flats.'

…around the same time, a patient came into National Jewish…diagnosed some years earlier as having…sarcoidosis, pulmonary fibrosis, there was some…argument in the medical community as to what they thought he really had…he still was…at Rocky Flats…a beryllium machinist …around that same time, I had developed the ability in our research laboratory to test the blood cells for their reaction to beryllium. So I invited him to give me a sample of his blood.

As he tells the story…"Yeah, you took 22 tubes of my blood, Dr. Newman."…we took a lot of blood and I was able to demonstrate that his blood cells, if…fed beryllium, would proliferate… over-react to the beryllium. What…we call today a Beryllium Lymphocyte Proliferation Test, because this category of white blood cells called lymphocytes…are… looking for foreign invaders. If you put beryllium on them, if they've seen beryllium before in your body, they will react by proliferating. They will divide and divide and divide…the same thing that happens in a beryllium-diseased patient's lung. So his cells reacted, this alerted us…that he probably had beryllium disease. I did a special test called a lavage of his lungs, to confirm that his lung cells reacted to beryllium…to confirm the…the first documented case of beryllium disease at Rocky Flats.

(And this would have been in...?) In 1985…that's in the ballpark…we said…this is potentially important. In… preventive medicine…occupational health, if you see one person with a disease and you know that they've had exposure in the workplace, the probability is that other people have been likewise exposed and that there will be other cases of disease. So…we followed…up with Dr. Wright out at Rocky Flats…we said…we've got this fledgling blood test which…had been discovered around 1970, but…wasn't really being used. But I had…improved the assay in the lab…we said…if you've got one case out there, there may be others, people who are sensitized or are allergic to beryllium. We'd like to use this test out there at Rocky Flats.

Dr. Wright's comment was…that sounds really interesting, we'd love to have you come out and use that test here in the workplace for your research study. But I suspect that you won't get the Steelworkers Union to agree to it…there was a lot of tension, contract negotiations…we…went to the Steelworkers local…it might have been Jim Kelly who was the President…and…some of his health and safety people. We contacted a guy named Mike Wright…with the Steelworkers International. They brought out some medical advisers…they all reviewed what we were doing…they said…we want you to do this, but we …doubt that you're going to get management and Medical to agree! So there was…a fateful day where…we agreed -- for everyone to sit down together…and discussed…this pilot investigation. Originally, we wanted to look at…retirees, because we thought…there'd be a better chance of detecting disease…we assumed that the disease would take a long time to develop…they really wanted us to… look at the current machine shop workers…50 or 55 workers. So we said, OK……we won't get much in the way of results.

(Do you know why they wanted just to focus on current workers?) …they had greater immediate concern for them…So we agreed…we wrote up a proposal…there was a review of all this…the feedback that we got was that the Department of Energy and the beryllium industry which is really one company, Brush-Wellman, that they weren't very enthusiastic…and were…discouraging Rockwell International, who…was operating the plant for the DOE…from letting us conduct the study…after that whole series of discussions…a head of Health and Safety, I think…George Campbell…said…, "Look…this is a decision that Rockwell can make, this is the right thing to do, and we want you to do it…Rockwell International directly funded the pilot study that we did….on a pretty tight little budget, we tested 50 or so workers.

The results have been published in the medical literature because they were so shocking…about 10% of the current machine shop workers were not only sensitized to beryllium, they already had the allergy…when they came…to National Jewish and I did the bronchoscopy procedure to look inside their lungs, I found that most of them already had beryllium disease…

(Were you surprised?) I was surprised by the number of people affected. I expected that…we might find maybe…one….we did not expect that we would have a tool here that would tell us who already had disease…the other big surprise was…it was telling us that those people were already at stages of illness, some…very mild, some…more severe…

(I presume that you couldn't have known much about what they did with beryllium because everything was so secret…?) …we found ways to work with that…I had never held a Q clearance, so I couldn't ask certain questions. So imagine being a doctor, taking a medical history looking for occupational disease…the patient would say to me, I really can't talk about that, Doc! …I had to learn…what…questions…were within bounds and…out of bounds.

(Could you give an example of that?) …it would be OK for them to tell me that they were machining parts that went into triggers for nuclear weapons, what they wouldn't tell me was the shape….Another example is…they wouldn't necessarily tell me…whether it was pure beryllium or an alloy, but it was OK to tell me that they were working with beryllium…They could tell me what buildings they worked in…but not the details…I would learn that they were milling, grinding, polishing, casting, breaking casts out of molds. The tasks that a worker would do became…clear to me through…taking hundreds of…medical histories....

(You say you saw hundreds…?) We had done the pilot study…it was a…rather shocking result…Our best thing to do was…to write up the results and get them published in medical literature…with very solid support from the Steelworkers as well as from management and Medical…we were able to…apply for…funding from the National Institutes of Health…to do a larger population-based epidemiologic study of a larger portion of the Rocky Flats plant.

So we…got funded from the Heart, Lung, and Blood Institute at the NIH…We studied almost 900 workers…The results also got published around 1993…it confirmed …the results that we had found with some other startling findings…if you were ever a beryllium machinist, there was nearly a 10% chance that you were at least sensitized to beryllium, and a pretty high percentage of them already with beryllium disease. The second…surprise was that we also found sensitization and disease among…security guards, secretaries, front office workers, managerial

types…they may have had bystander exposure, but…weren't the day-to-day operators….they are going through areas and getting exposed…there is an element of genetic susceptibility….So if you are genetically susceptible and you get around beryllium…that puts you at higher risk… There's…traffic, that went in and out of the beryllium shop into the administrative areas...

(But your pilot study…was the first, then, to show this kind of....?) That's right…it really was …revolutionary…it then became the most common occupational disease of…Cold War veterans…It made us very busy in trying to take care of these patients, and realizing that there was…more research we needed to do…First…if it was a problem at Rocky Flats, why wasn't it a problem at other sites? Second…there was now a blood test…to pick up the disease at its earliest stages…that could be used in a broad screening…to pick up disease that otherwise was being mislabeled by doctors in the community or not being diagnosed at all. So this was really leading to…using this blood test as a tool for…medical surveillance, going to the people who work with the metal, testing their blood periodically to figure out who else would be sensitized or diseased. And that's what happened. By 1993, Rocky Flats had institutionalized a medical surveillance program using the…Beryllium Lymphocyte Proliferation Test, they tested thousands of current workers…later…testing thousands of former workers…but the interesting thing is that the data that Dr. Kreiss and I published from the work we did in the `80's has held up.

…So the next step…was…pilot studies…at other sites around the nuclear weapons complex…by the late `90's, we knew that there were cases of beryllium disease at…Los Alamos, …Pantex…Oak Ridge at the Y12 facility…if there was beryllium being used…and it…could produce dust…there was a significant risk for beryllium disease.

The workers from Rocky Flats have been one of the highlights of my personal life and career…These are people who, faced with an illness themselves, turn…to me and say, how can I help?

(Did they start giving workers protection early on?...) …shortly after the discovery of the first cases of beryllium disease in the machine shop…they put everyone into respiratory protection…they put in place a lot of controls…handling beryllium in a much more careful way.…they started giving them hazard pay for working in the beryllium areas…They started restricting people from having entry into that shop…

(Can you talk about what's the difference between sensitization and getting the disease; does the sensitization always lead to…getting the disease?) …Beryllium sensitization means that…their blood has shown that they are allergic to beryllium, their lymphocytes react to beryllium…people who are not sensitized, you put beryllium on their cells and nothing happens…To have beryllium disease, you have to show that…in the lung, there is damage…you have…lymphocytes…from the blood, going into the lung, finding beryllium, and then proliferating and forming balls of cells to try to engulf the beryllium particles…It's like a war …with the lung as the battle ground…it trashes the battlefield…so the lung becomes injured, people are unable to get a deep breath anymore, they're coughing, they're short of breath, they're fatigued…you've interfered with the job that the lungs have to do to take oxygen from the air…and deliver it to the blood stream….doctors can measure that with X-rays, CT scans, and breathing tests, and measurements of oxygen.

So the disease itself means that you've actually shown someone to have the immune system scars in the lungs from the beryllium exposure…we're finding that not everyone who's sensitized gets the disease, but the majority…do….I have some patients from…Rocky Flats… who are now going on 15 years of being sensitized without disease. But there aren't many of them…Fortunately, for some…the disease stays very mild…for some…it's much more progressive…

(And what would you say is the difference, a genetic kind of thing, or exposure, or?)… there isn't a simple answer…my working hypothesis is that…other genes…are involved in the risk of developing more severe forms of Chronic Beryllium Disease…There may be features of the exposure, the dose, how rapidly, how many times, who knows, cumulative dose. certain things … probably all factor in to whether you get severe disease or mild disease.

(…the disease…can cause death?) …yes, it can be deadly, and I have lost patients to beryllium disease. The old literature says that about 28 to 32% of patients with beryllium disease die of the disease. That was from people who had exposures back in the 1940's and `50's at levels that as best I can tell far exceeded the kinds of exposure levels at Rocky Flats. But…if somebody waits too long to get in to a doctor, they can end up with a disease that is much harder to treat… Probably today we're seeing fewer deaths because we're diagnosing it earlier...

(…the workers at Rocky Flats, do you think most of them have been eager to come in and get tested, or has there been some resistance?...)…The workers from Rocky Flats have been one of the highlights of my personal life and career…these are people who, faced with an illness themselves, turn…to me and say, how can I help? …we've had for nearly 20 years an incredible outpouring of volunteerism and support from the workers…they say…'Tell me what I can do to help the research'…I would say probably 90% of anyone…diagnosed with beryllium disease or…sensitivity out at Rocky Flats has… participated in a research study…some patients…come in who had invasive procedures done, bronchoscopes done, five, six, seven times, over…a decade…because they want to participate in the research…it's been an amazing lesson for me…unselfish behavior that people can display in the face of personal adversity.

(Do you know why…?) I don't know. There surely was a lot of camaraderie… **(You're saying, there is a fair degree of anger, understandable anger...) …**there's been a great deal of anger among…the workers at Rocky Flats over what's happened to them. Compounded by the rather shabby way in which the Workers Compensation system in this state has dealt with them.

(Can you speak a little bit about that? …why they didn't get Workers Comp…) …You have to understand the basic principle of Workers Compensation. Since the early 1900's, the deal has been that if I'm injured on the job, I can't sue my boss. But in return my boss promises to take care of…my medical bills related to that illness, or that injury, and to provide me with the fair replacement wage if I lost an earning capacity. That's the basic deal….that contract between workers and their employers is a rather tattered and torn contract today.

And so…you have people who through a Department of Energy-supported program get screened for beryllium disease or are diagnosed…as having the disease. And….that report of…their work-related illness -- goes into the Workers Comp system…the insurance company that was insuring …Dow Chemical or Rockwell International, EG&G, or Kaiser-Hill…the first thing they do is they deny the claim….a knee-jerk reaction, any occupational illness, we have a policy to deny the claim, and then it's…on the back of the worker to file an appeal. So …they'd get a lawyer….file the appeal, and then it's lawyer to lawyer in front of a judge, and back and forth, and hired-gun medical experts to say that Dr. Newman is wrong…about the diagnosis or the severity…I'm going into court next month over people from Rocky Flats who were diagnosed close to a decade ago, and they are still arguing in the State of Colorado over compensation for people who clearly have the disease. You can understand the anger…it becomes a lawyers' game…a very sad story. Really a screw job.…these workers…see themselves as patriots… doing something for a war effort in this country…there's…a sense of betrayal.…

(That we did our job, and why can't they take care of us when they screwed up?) …certain other things started happening…the Department of Energy acknowledging that yes, this is a problem…some years later…Congress instituting an Energy Employees' Compensation Act, which, in large measure, was implemented because of the beryllium problem. That was, in fact, the driving disease issue that led Congress to act.

(Were you involved in that…?) Oh, sure. I was contacted by several different Congress people…a bi-partisan effort -- who were all interested in coming up with this legislation. …one of the Congressmen…put my testimony into the record, I was too busy seeing patients!...I worked…with…the Department of Energy…as somebody who has the research…and the patient care information, my job was to translate that to the policy-makers. So that's what I did.

(Are you satisfied with the results of that legislation…what it's doing for workers?) …it may be a little too soon to say…what some of my patients really wanted was for someone to say, 'We did this to you and we're sorry'…For others, giving them lifetime medical benefits and $150,000 isn't enough to compensate for their pain and suffering, as far as I'm concerned…whether it ends up being…a well-managed program…that really meets the needs of these patients…time is going to tell.

(Do you think there are any issues with…people who have…a combination of illnesses from Rocky Flats…?) …We do have some people who have more than one disease….an injury as well as beryllium disease, their injury won't get them compensated under that program but the illness will…. Interestingly, through the political process, certain diseases that probably should have been included aren't…There's another disorder…related to inhaling plutonium…my guess is that the legislation is not broadly written enough to compensate people who have lung fibrosis from plutonium exposure; it's not on the list…

(And do you see those people…in your practice…who have ingested or inhaled plutonium?) Oh, yeah. It was common practice if you were a plutonium worker and you were too "hot," they had to move you out…then…they moved you to the beryllium side…the "cold" side…a lot of my patients carry partial body burdens or lung burdens of plutonium and americium as well as their beryllium. A common quote in my clinic, "Doc, if I had known about the hazards of beryllium I would have stuck with plutonium." …they knew that plutonium was bad news…Then they went

over to beryllium…they were…generally poorly informed about the hazards of beryllium…A pretty common story.

(And in your experience is that…because they weren't protected nearly as well for beryllium…there was better protection for plutonium?) Oh, sure. …there was a lot more attention to how you handled "hot" materials at the plant than to the "cold" side of things…on the "cold" side you had…vanadium and beryllium and various other metals...you're talking about highly skilled workers…who have a lot of talent and do high-quality precision work…even what OSHA [Occupational Safety and Health Administration] would say was safe wasn't a safe level, either…

…a patient was sent in to me with an abnormal chest X-ray…a retired worker…in plutonium as well as in beryllium operations…his X-ray was abnormal, but he wasn't showing up sensitized to beryllium. And I took a copious occupational history…a complete medical work-up…a lung biopsy. And ended up showing a lot of lung scarring but not beryllium disease…I said, "Well, sir, you don't have beryllium disease…I haven't seen anything quite like this." And he said, "Well, Doc, could it have something to do with that plutonium accident I was in?"…he proceeded to tell me about the explosion…he was there doing an operation involving plutonium…the glovebox blew apart…he lost part of a finger and inhaled plutonium and ended up being taken to the Medical Department and kept there for a number of days because they were collecting everything that came out of his body to establish how much exposure he had had….nearly 30 years later…he was coming into my clinic with lung scarring.

…I started…looking at animal studies…at the Hanford site…at the effects of plutonium inhalation on animals….darned if the animals that survived the cancers by the end of their life didn't develop something that looked a…lot like my patient's disease…fibrotic lung disease. And that's what they were seeing in the…dog models…10-12 years after inhaling plutonium oxide.

…I went back to the medical department at Rocky Flats…and said, "…I think that plutonium might be causing lung fibrosis." …I said…let's just look at the X-rays…among your people who had the largest lung burdens of pluton-ium…And we starting putting up X-rays…20 or 30%...were abnormal…I applied…to NIOSH, National Institute for Occupational Safety and Health, part of the CDC, for funding to…look at the risk for plutonium fibrosis in people who had plutonium exposure…we ended up pulling…hundreds of X-rays, getting the radiation records for those people, and then correlating them. Asking, as you increase someone's dose of exposure to plutonium, was there an increase of the risk of having abnormal X-rays that go along with lung fibrosis?...after you subtract out whether they smoked and other factors…was that still a significant contributor…the answer was yes, there is a disease called Plutonium Lung Fibrosis…

During the time…I was conducting the research, a Russian group published a paper on the subject…from their experience at Mayak, showing that they were getting…"pneumosclerosis", which we translate as pulmonary fibrosis, among the plutonium-exposed workers there. So now on both sides of the [Iron] Curtain, researchers are coming up with the same finding….that for people who have a…cumulative lung deposition for 30-year estimate greater than 1,000 REM, there's a very high rate of lung fibrosis…

…**(Anything else you would want to say…to conclude?)** …I've learned a lot about…the resilience of the human spirit…, what people can do when they set their minds to it …even in the face of organizations that tell them, don't do it. I think back to the head of Health and Safety who…said… this study should be done, it's the right thing to do….if he had said no, where would we be today? I think about that first patient…who stuck out his arm for me to draw his blood. If he had said no…would we have gotten to the same place?...usually there were the one or two key people who acted…on their conscience, did the right thing…you don't give up when you know that the right thing to do is to prevent disease. …what the people at Rocky Flats learned through their experience with this disease…will end up preventing other people from ever getting this disease…in other industries…they can come back and thank the people at Rocky Flats. **Read the entire interview of Dr. Lee Newman at www.boulderlibrary.org/oralhistory/.**

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