

An Interview with Carl Gertz

An Oral History produced by
Robert D. McCracken

Esmeralda County History Project
Esmeralda County, Nevada
Goldfield
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PREFACE

The Esmeralda County History Project (ECHP) engages in interviewing people who can provide firsthand descriptions of the individuals, events, and places that give history its substance. The products of this research are the recordings of the interviews and their transcriptions.

The Esmeralda County Board of Commissioners initiated the ECHP in 1993 in order to collect information on the origin, history, traditions, and quality of life of Esmeralda County communities that may be impacted by the construction of a high-level nuclear waste repository located at Yucca Mountain, adjoining the Nevada Test Site in Nye County. Though the repository has yet to be built, the ten oral histories in this group of interviews were paid for by county monies received in connection with the Yucca Mountain effort, which is now in hiatus.

In themselves, oral history interviews are *not* history. However, they often contain valuable primary source material, as useful in the process of historiography as the written sources to which historians have customarily turned. Verifying the accuracy of all of the statements made in the course of an interview would require more time and money than the ECHP's operating budget permits. The program can vouch that the statements were made, but it cannot attest that they are free of error. Accordingly, oral histories should be read with the same prudence that the reader exercises when consulting government records, newspaper accounts, diaries, and other sources of historical information.

It is the policy of the ECHP to produce transcripts that are as close to verbatim as possible, but some alteration of the text is generally both unavoidable and desirable. When human speech is captured in print the result can be a morass of tangled syntax, false starts,

and incomplete sentences, sometimes verging on incoherence. The type font contains no symbols for the physical gestures and the diverse vocal modulations that are integral parts of communication through speech. Experience shows that totally verbatim transcripts are often largely unreadable and therefore a waste of the resources expended in their production.

While keeping alterations to a minimum the ECHP will, in preparing a text:

- a. generally delete false starts, redundancies and the *uhs*, *ahs* and other noises with which speech is often sprinkled;
- b. occasionally compress language that would be confusing to the reader in unaltered form;
- c. rarely shift a portion of a transcript to place it in its proper context;
- d. enclose in [brackets] explanatory information or words that were not uttered but have been added to render the text intelligible; and
- e. make every effort to correctly spell the names of all individuals and places, recognizing that an occasional word may be misspelled because no authoritative source on its correct spelling was found.

ACKNOWLEDGMENTS

As project director, I would like to express my deep appreciation to those who participated in the Esmeralda County History Project (ECHP). It was an honor and a privilege to have the opportunity to obtain oral histories from participating individuals. I was welcomed into many homes and was allowed to share in the recollection of local history. I thank the residents throughout Esmeralda County and Nevada too numerous to mention by name who provided assistance and information. They helped make the successful completion of this project possible.

Appreciation goes to the Esmeralda County Commissioners who initiated the project in 1993: Chairman Wade Barton, Virginia Ridgway, and Joyce Hartman. Appreciation also goes to current Chairman Nancy J. Boland, William C. Kirby, and Dominick Pappalardo, who initiated the current project in 2012, and to Ralph M. Keyes, who became a commissioner in 2013. Ed Mueller, Director, Esmeralda County Repository Oversight Program, gave enthusiastic support and advocacy for this effort. The United States Department of Energy, through Mr. Mueller's office, provided funds for this round of interviews. Thanks are extended to Commissioners Boland, Kirby, Pappalardo, Keyes, and Mr. Mueller for their input regarding the conduct of this research and for serving as a sounding board as we worked out methodological problems. These interviews would never have become a reality without the enthusiastic support of the Esmeralda County commissioners and Mr. Mueller.

Jean Charney served as editor and administrative assistant throughout the project; her services have been indispensable. Jean Charney and Robert B. Clark transcribed a number of interviews, as did the staff of Pioneer Transcription Services in Penn Valley,

California. Julie Lancaster and Suzy McCoy provided project coordination. Editing was done by Jean Charney and Darlene Morse. Proofreading and indexing were provided at various times by Darlene Morse and Marilyn Anderson. Joni Eastley proofed all the manuscripts and often double-checked, as accurately as possible, the spelling of people's names and the names of their children and other relatives. Jeanne Sharp Howerton provided digital services and consultation. Eva La Rue and Angela Haag of the Central Nevada Museum and Suzy McCoy served as consultants throughout the project; their participation was essential. Much-deserved thanks are extended to all these persons.

All material for the ECHP was prepared with the support of the Esmeralda County Nuclear Waste Repository Oversight Program, funded by the U.S. Department of Energy. However, any opinions, findings, conclusions, or recommendations expressed herein are those of the author and the interviewees and do not necessarily reflect the views of Esmeralda County or the U.S. DOE.

ô Robert D. McCracken
2013

INTRODUCTION

Historians generally consider the year 1890 as the close of the American frontier. By then, most of the western United States had been settled, ranches and farms developed, communities established, and roads and railroads constructed. The mining boomtowns, based on the lure of overnight riches from newly developed lodes, were but a memory.

Yet, even in the 2010s, the spirit of the American frontier can still be found in Esmeralda County, Nevada, in the attitudes, values, lifestyles, and memories of area residents.

Esmeralda County was established by an act of the Territorial Legislature of Nevada on November 23, 1861. The first boom camp in the county, Aurora, named after the goddess of dawn of Roman mythology, mushroomed into existence in the early 1860s with a population of at least 5000. The name Esmeralda, Spanish for "emerald," was provided by a member of the party that made the initial discovery of gold at Aurora; the individual probably had some beauty in mind—the term was then a common name for girls with green eyes. Another version is that the name referred to the Gypsy dancer Esmeralda in Victor Hugo's novel, *The Hunchback of Notre Dame*. Discoveries at Aurora were followed by others at Columbus (1864), Red Mountain/Silver Peak (1864), Gold Mountain (1866), Palmetto (1866), Montezuma (1867), Oneota (1870), Sylvania (1870), and Lida Valley (1871). Goldfield, which sprang to life in 1902, was the last great mining camp of the American West, and one of the greatest gold camps in the history of the world. Along with Tonopah (1900) and Rhyolite (1904), its two sister boomtowns, and several score of

smaller, shorter-lived daughter camps located on the central Nevada desert, Goldfield was the last magnificent flowering of the American frontier.

Between 1903 and 1942, Goldfield produced approximately 7.7 million tons of ore containing more than 4.1 million ounces of gold and over 1.4 million ounces of silver, worth \$90 million, mostly when gold was priced at \$20 per ounce. Goldfield's glory days were from about 1904 until World War I. After approximately 1918, mine production declined to a fraction of what it had been, yet the town lived on. It survived a terrible flash flood in 1913 and a catastrophic fire in 1923 that wiped out a substantial proportion of the town— at least 33 square blocks, by some old-timers' estimates. Another fire in 1924 nearly applied the coup de grâce to the grand lady, but still she persevered.

Much has been written concerning Goldfield's prosperous years, but relatively less material is available on the town and its people from the decades following the end of World War I. Much of the history of Esmeralda County is stored in the memories of individuals who are still living.

Aware of Esmeralda County's close ties to the land and our nation's frontier past, and the scarcity of written sources on local history after 1920, the Esmeralda County commissioners initiated the Esmeralda County History Project (ECHP) in 1993. The ECHP is an effort to systematically collect and preserve the history of Esmeralda County. The centerpiece of the ECHP is a set of interviews conducted with individuals who had knowledge of local history. Each interview was recorded, transcribed, and then edited lightly to preserve the language and speech patterns of those interviewed. All oral history interviews have been printed on acid-free paper and bound and archived in Esmeralda County libraries, Special Collections in the James R. Dickinson Library at the University of Nevada at Las Vegas, and at other archival sites located throughout Nevada.

The interviews conducted between 1993 and 1994 vary in length and detail, but together they form an unprecedented composite of life in Esmeralda County after 1920. These interviews can be compared to a bouquet: Each flower in the bouquet is unique—some are large, others are small—yet each adds to the total image. In sum, the interviews provide a view of county history that reveals the flow of life and events for a part of Nevada's past that has heretofore been largely neglected by historians.

A second set of interviews was initiated in 2011. The goal here was the same as for the interviews collected 20 years earlier—provide a view of Esmeralda County history unavailable elsewhere through interviews with county residents. However, in this series interviews were also conducted with a second goal in mind. Over 97 percent of the land in Esmeralda County is controlled and managed by the federal government—more than any other county in Nevada; indeed, in any state outside Alaska—and of the private land approximately 50 percent consists of patented mining claims, leaving little opportunity for community expansion on private land. A large percentage of Esmeralda County residents consequently believe the county is in large measure governed by the federal government as opposed to elected state of Nevada, county, and local officials. Many feel the strong presence of the federal government has the effect of constricting economic opportunity and personal freedom for local residents in many areas of life and would like to see changes made in that arrangement with the transfer of more control to local and state government. Those issues formed part of the focus of these oral histories.

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This is Robert McCracken talking to Carl Gertz at his home in Henderson, Nevada, September 12 and 20, 2011.

CHAPTER ONE

RM: Carl, why don't we start by you telling me your name as it reads on your birth certificate?

CG: Carl Peter Gertz.

RM: And when and where were you born?

CG: I was born in Chicago, Illinois, August 27, 1939.

RM: And what was your mother's full name?

CG: My mother's name was Bernice Rose Karpis. She was born in Chicago in 1910.

RM: What was her background?

CG: A housewife, essentially.

RM: How did her family earn a living?

CG: Her dad worked for the railroad. He did not speak English. He was Lithuanian and he came over from Lithuania at some time and settled in the Chicago area.

RM: And she grew up there.

CG: She grew up in Chicago.

RM: Is there anything you want to say about her family?

CG: Not necessarily. It was a middle-class South Side Chicago neighborhood.

RM: And what was your father's name?

CG: My father's name was Carl Frederick Gertz. He was born in 1904 and grew up in Chicago.

RM: And what was his family's background?

CG: I think they did some activities in Wisconsin, farming or something. When his

dad moved to Chicago, he became what they call a steamfitter or a pipefitter. He worked on some of the large buildings being built in Chicago.

RM: And so you grew up in Chicago? What do you recall about your early years there?

CG: In the early years, we lived in an apartment in a tenement-type neighborhood. I lived in a neighborhood at 68th and Ashland, 1448 West 68th Street. It was called Inglewood at the time, definitely a South Side neighborhood in Chicago. I went to a public grammar school for eight years plus kindergarten, nine years at Altgeld Grammar School.

Then I went to high school for four years at Harper High School. My childhood was typical of an inner city kid in the 40s and 50s. My dad worked for the Electromotive division of General Motors building diesel locomotives. He got that job after the Depression. He was 35 when I was born and my mom was 29.

I had two brothers, both younger than me, one born in 41, one in 45. They're both deceased, unfortunately. Growing up, I enjoyed playing Little League baseball, basketball, and football—the kind of stuff kids do. In high school I played varsity basketball and varsity golf.

One of my fond memories growing up is caddying at a country club out in the suburbs. My dad would drive me out there when he wasn't working and I'd take the bus back. When he had to work, I'd take the buses both ways. That particular experience certainly enlightened me on what other people could do to make a living—doctors, lawyers, engineers, whatever.

RM: So it broadened your horizons.

CG: It certainly broadened my horizons from the neighborhood tenement apartment. I loved it. I played, as I said, golf and basketball in high school.

RM: Was your neighborhood rough?

CG: I would consider it medium tough. The South Side is known as being tough. It was an ethnic neighborhood— Irish Catholic, Italian. By background I'm half Danish and half Lithuanian.

RM: Did your dad's parents come from Denmark or how far back did it go?

CG: I am not sure. One of my daughters, Cortney, has some of that history. Certainly his parent's parents came from Denmark. Obviously, my mom's parents came from Lithuania.

RM: I wonder what brought them to this country.

CG: I never delved into it much. As I said, one of my daughters has done some genealogy, but I haven't talked a lot about the details with her. I think they came for a better life. They both chose leaving Lithuania and/or Denmark.

I'd like to back up for a moment. Of course, kids in Chicago are sports oriented. And unlike today, every kid was not a participant. I tried out for Little League and there were 4,000 kids trying out. It was for only six teams of 15 a team. I was very, very fortunate to make that.

RM: Now, that was baseball?

CG: Baseball. I was in Little League when I was 11 years old.

RM: So you were a pretty good athlete.

CG: I was pretty good. And I'll tell you a short story about perseverance. As I said, this was before modern Little League, where every kid gets to play somewhere. This was very competitive. We had tryouts. They cut from probably 4,000 down to 1,000 and then to 500 kids. About the fifth tryout, I thought I did okay. I came back and the tryout observer said, "You're pretty good, but you're just not going to make the cut." So I went

home and I was absolutely in tears. And all of a sudden later in the week, my mom got a postcard and said, "They want you to come to one more tryout."

And I said, "Boy, that must be a mistake." I felt good and I went to the last tryout. This time I didn't do very well—the ball went through my legs, then I dropped it. So I was feeling, "Okay. I had a last tryout and I didn't make it."

At the end of the tryout, they gathered the kids together and said, "You know, we've had some athletes here today" and they named them. "You guys are going to be in the league," so to speak. "But there's another lesson I want you all to learn. See this kid over here?" And he pointed to me. "Now, he's been to all the tryouts. I don't know why he's here today because we thought we cut him last time."

I think I said, "Well, I did get a postcard."

He said, "You didn't do well today. But because of your perseverance, we're going to let you be on the team."

RM: Oh, what a story.

CG: It set the stage for what I'd like to call perseverance. Just keep at it, keep at it, keep at it. And have a little luck—because how I got that postcard I'd never know.

RM: I wonder how you did.

CG: I don't know, but it was an interesting sidelight that I will always remember as being very fortunate. I was an outfielder. But the next year, I became an infielder—second baseman and shortstop. The next year I went to a different Little League, and it was much more inclusive; it wasn't as competitive during tryouts.

RM: How long did you do that?

CG: I played Little League for two years and then softball in high school. Then I focused on making money for my family by caddying because the money I made went

into our family financial coffers, so to speak.

RM: Do you have any other stories about growing up?

CG: Sure. Caddying certainly was a seven-day-a-week job. We'd go out there every morning in the summer and after school during the spring. I did that until I became an athlete in high school when we had practices. The caddying taught me how to deal with all different individuals, different vocations.

One interesting sidelight is I was chosen to be a caddy for Sam Snead and Dr. Cary Middlecoff during the pilot filming of "Golf for TV." They were the top golfers in the country in 1956. Here's a great experience: It took us five days to film 18 holes because you had to haul the cameras and cables from hole to hole. It was at Cog Hill in Chicago, a world-famous golf course. I am told that that pilot film is in the Golf Hall of Fame in Florida. Some day, I'd like to look it up! That was my claim to fame as far as being a caddy and working with professional golfers.

RM: So you caddied for Snead?

CG: We'd alternate each day, Snead and Middlecoff. One day I'd caddy for Snead, the next day for Middlecoff. They were both gentlemen. I would say that Dr. Middlecoff was much more pleasant to the caddies than Sam Snead was, although Sam Snead had a nice persona with the media. It was narrated by a long-time Chicago broadcaster called Jack Brickhouse, who is I think in the Chicago Hall of Fame. He also was a broadcaster for the Cubs.

RM: What an experience. Then you graduated from high school, and what did you do next?

CG: I had good grades and good standardized test scores and I was able to obtain an academic scholarship to Michigan State University. I had never left Chicago except for

maybe a family trip to the Indiana Sand Dunes or the Mississippi River. I had two opportunities for scholarships. One was through being a caddy. They had what they called the Chick Evans Foundation and I qualified for that, but it appeared financially more beneficial to take the academic scholarship at Michigan State.

I went to Michigan State in East Lansing, Michigan, and studied to be a civil engineer. I graduated in four years. I had two summer jobs, one with the Illinois Highway Department, and the next year with the Baltimore-Ohio Railroad. I literally worked with the chain crews on the railroad laying out track, and with the highway department overseeing bridge construction and conducting traffic studies. I am glad I was able to use my civil engineering background.

RM: What motivated you to go into civil engineering as opposed to some other discipline?

CG: I guess I liked to see things being built. In Chicago, I'd see a building going up and it always piqued my interest as to how they were doing it, how it was designed. As you're well aware, Chicago is famous for its skyscrapers. I was also interested in the transportation systems, how the el/subway worked - all those kind of things. I wasn't mechanically oriented; that didn't interest me as much as the building aspect. It kind of set the stage for my career later on as a civil engineer/project manager.

RM: Is there a skyscraper or a building in Chicago that stands out in your mind that kind of inspired you?

CG: Probably the Prudential Building, which was one of the bigger buildings in Chicago when it was completed. And I guess maybe the long-time history - the fact that Chicago recovered from the Great Chicago Fire and put in building codes and built steel structures.

RM: Then you did four years at Michigan State in civil engineering and working in the summers.

CG: That's correct.

RM: So you didn't get home that much after that?

CG: I lived at home for the Illinois job, but the Baltimore-Ohio Railroad job was in Baltimore, Maryland. It was a great job. The other summer in college I had to go to a civil engineering camp in northern Michigan to learn surveying. It was on the Sault Ste. Marie River in the Upper Peninsula, the U.P. That was another great experience.

RM: What did you do after you graduated from Michigan State?

CG: After I graduated from Michigan State, I interviewed for jobs and I had about three offers, one with Northern Public Service in New Jersey, helping them build their energy plants. Another job offer was with the highway department in San Bernardino, California, and the third offer I had was from the Boeing Company. They were just starting to build missile sites in Montana and they needed engineers to assure the missile and the system were compatible with the silo construction.

RM: What year did you graduate from Michigan State?

CG: I graduated in 1961. I had an old car that my uncle gave me, a 1955 Dodge, and I drove all the way across the northern tier of the United States to Seattle, Washington, to start work at Boeing.

RM: Was there anything in your years at Michigan State that stands out in your mind that was formative? Any special story or event or anything?

CG: I did enjoy the camaraderie of a fraternity there called Phi Delta Theta. I enjoyed going to school and meeting a diverse group of students who were different, of course, from those I grew with up on the South Side of Chicago. Most of them were more

affluent than I was. I realized that, but still made friends and enjoyed my time at Michigan State.

RM: And you had a full ride scholarship all the way through Michigan State?

CG: I had essentially a full academic ride. I had to work in the summers, which was required as part of the scholarship. Then, each year they'd evaluate how much money you needed. Since my dad didn't make a lot of money, I qualified for room, board, and tuition.

CHAPTER TWO

RM: And then in 1961, you went out to Seattle.

CG: Yes, but the Seattle stay was very short. It was only about two months before I was sent out in the field to Lewistown, Montana. The US Army Corps of Engineers were building the missile sites. Our job was to ensure that the brick and mortar built by the Corps of Engineers was correctly constructed. This allowed the Boeing teams to install the Minuteman missiles and the equipment on schedule.

RM: Now, Boeing was building the Minuteman.

CG: Boeing was the integrating contractor. Different stages were built by I think Thiokol, Aerojet General, and Hercules.

RM: And contractors were building the silos.

CG: That's correct, for the Corps of Engineers.

RM: Is there anything in your two months in Seattle that stands out in your mind?

CG: No, my two months in Seattle were just training. But living in Lewistown was my first experience living in a small town, 5,000 maybe. It's 100 miles from Great Falls, which is the next biggest town, which was only 40,000.

In Lewistown, things did stand out to me. Sometimes we'd work all night to assure that everything was right when concrete was going to start to be poured later that night or the next morning. There was an urgency at the time to get the sites done—probably because of the missile crisis in Cuba.

These were offensive missiles, targeted at the Soviet Union. Obviously, it was a Cold War deterrent. The thing that stands out in my mind about that job, particularly in the early years, was the urgency to get them built. Literally, you'd be out there at 2:00 in

the morning making sure things were correct.

RM: But not urgency to the point where they screwed things up.

CG: Right. It was one of the big, fairly successful public programs. As I recall, Boeing sold the Air Force on the idea that other missile sites— and there were bigger ones before us called Titan and the Atlas— had lots of problems when they came to putting in those missiles. They had to rework them and they got way behind schedule. Boeing said, “Hey, we’ll put our people out there during construction. We’ll use engineers, people who have been educated in the field. We’ll put them out there and try to assure we have minimal problems when it comes time for installation.”

RM: What are some of the things you would do to make sure everything would fit?

CG: Well, the silo had pylons. When the transporter brought the missile up, they had to be perfectly level because they wanted to make sure it would go down the hole correctly. They wanted to make sure that when the steel silo, which was pre-fabbed by American Bridge Company, was set in the hole, it wasn’t slanted. Because the missile had to fit in with a certain tolerance. When it fired off they didn’t want any turbulence to cause it to go off course.

Other things were simpler. We had templates that replicated our equipment. We had to make sure that the wall as constructed would accept our equipment, and also to ensure that the wiring was correct.

RM: So it was extremely well thought out.

CG: Yes. Every place the Boeing equipment interfaced with the construction, we were responsible to make sure it was okay or else we’d reject it. If needed, the contractor for the Corps of Engineers would have to come back and fix it.

RM: How many individual missile sites were they building at Lewistown?

CG: There were 150 silos at each Minuteman complex. No silo, as I recall, could be closer than three miles to the other.

RM: Because otherwise, a strike could knock out multiple sites.

CG: Right. And each group of ten silos was controlled by a launch control center. I'm sure there was redundancy. But the launch officers, as the air force called them, would be underground. They had the ability to launch those ten missiles if commanded, and probably had access to some others.

So we were in Lewistown, a small town. We'd have to drive all times of the day and night to go to these sites in even smaller towns that were maybe 60, 80 miles from Lewistown. I got to see a lot of ranch land in Montana.

RM: Did you like Montana?

CG: I did; I like Montana.

RM: How long did you do that?

CG: I was there one year and then, with the same job, I moved to another missile site. This one was in Warrensburg, Missouri, central Missouri.

RM: And it was Minuteman, too?

CG: Yes, all Boeing was Minuteman. For about 16 or 17 years, I worked on assuring the installation of Minuteman missiles and the upgrades to the sites. After we put the missiles in, then they had to do upgrades, like making the site harder and stronger to resist a nearby nuclear attack. I went to great parts of the country.

RM: Did you like Lewistown?

CG: I did. This is when I was growing up 22, 23. I enjoyed the job and seeing different aspects of the country. My next stop was to North Dakota, a small town called Grafton. I have good memories of that town.

RM: What part of North Dakota is it in?

CG: It's just about 60 miles south of the Canadian border and about 12 miles west of Minnesota. It's an area called the Red River; the river flows north. I spent almost two years in Grafton doing the same things. We weathered tremendous cold winters. I remember one day seeing on the bank thermometers, as we were going out to work, minus 48.

RM: Oh, my lord.

CG: So that's one of my memories. Another is the amount of snow. We missed three days of work one time because we lived in trailers and the snow was up to the trailers. You could walk from rooftop to rooftop. You had to shovel your way out the door.

During the second winter we had a similar blizzard, and that presented an interesting opportunity for me. We determined that some of the sites that were near completion could suffer flooding when the snow melted. I was chosen to ride a helicopter and survey the sites. It was my first time in a helicopter. We flew over 150 sites, seeing which ones could be threatened by flooding. If we thought one was, we ordered equipment to go out and plow away the snow from the missile site.

RM: When the water got in the silo, did it do a lot of damage?

CG: It could do damage, but we believe we stopped that from happening.

RM: And you were in North Dakota two years?

CG: I was in Grafton, North Dakota, for two years. I had met my wife at that time, Carla, in Missouri. We got married, went to North Dakota and my first daughter, Charla, was born in the Grafton, North Dakota, hospital.

RM: How nice.

CG: The doctor was an ex-Canadian who chose to leave their medicine system and

work in North Dakota. She was born in 1965 and it was a fairly liberal hospital. I was allowed to be in the delivery room with my wife for the birth of my first child. That was a great experience.

RM: Did your wife have a hard time adjusting to the North Dakota winters?

CG: I don't think she did.

RM: Did you?

CG: I did not.

RM: Well, you were used to Montana and grew up in Chicago.

CG: It's just different. You're working and you get used to it. One thing that did help. We moved in groups, so we had a trailer park up there with maybe 200 Boeing people. It had a rec hall, lots of conveniences. Some of the people we had worked with in Missouri and Montana moved there also. So we had our own little community of people that had spent eight or nine years working on missile sites that did move together.

RM: Have you maintained relationships with any of those people?

CG: A few of them. In fact, in a week we're going to have two of my old friends from the missile days over for dinner. They also retired in Las Vegas.

RM: What did you do after Grafton?

CG: Well, after Grafton, we went back to Missouri because after the sites were completed, they wanted to make them stronger to withstand any nuclear attack. Again, my job was to ensure construction met specifications. I lived in a small town called Butler and another called Sedalia. They were both interesting towns, both in the trailer park community.

Then back to North Dakota. I will tell you an interesting side story about golf. At the time in the northern states they weren't able to maintain grass greens, so instead they

had sand with oil on it. When you hit onto the green, the ball would kind of stop because it was sand. Then you took a heavy rake and raked a path about two-and-a-half feet wide to the hole, which was always in the center of the green. That became smooth and you putted along the sand. I happened to win the city championship of that small town on sand greens. Very few people I talk to these days can remember playing on sand greens. I guess with agronomy, they're able to keep grass alive these days in those areas.

And I was also introduced to an interesting sport up there called curling. It's an Olympic sport where you push a rock down the ice. I wasn't much of a bowler so for recreation one night a week I'd curl with the locals.

RM: And you actually did it on ice?

CG: We did it absolutely on ice. It's indoors, so it's like an ice rink, but there are really curling centers. If you've watched curling in the Olympics, there's a bulls-eye at the end and you just push the rock and shoot it down the ice. I have kept a pretty close friendship with another curler, Alan Haws, who lives in Oklahoma.

RM: When you were working on hardening silos or ensuring the sites, what kinds of things were you doing as an engineer?

CG: Some things were as simple as assuring there were enough clamps on cable systems so the cables wouldn't come lose during a shake, rattle, or roll. We also decided to put more concrete around the outside to make sure the silo had enough of a buffer against any shock.

RM: And this was all being worked out with engineering skills, like how many clamps would be needed under such-and-such a pouf?

CG: Someone who designed that, right. And were the welds correct? Do we have to beef up the welds? Instead of a quarter-inch weld, do we have to go in and re-weld it and

make it a half-inch now? Because what may have been designed in 1961 when they started may have changed by 1966 as we understood what our Cold War opponents, the Soviet Union, were doing.

RM: And a site could not stand a direct hit, right?

CG: No, one missile site could not stand a direct hit. The idea was you need 100 missiles to take out 100 missile sites; that was part of the theory. What you didn't want was a near miss to take four or five sites because of the shock.

Another thing that was called hardening was electromagnetic filter hardening. They were able to figure out that some of the incoming missiles could emit electromagnetic pulses that would mess up all the electronics in our missiles. We had to seal all the openings.

Although I wasn't involved with this aspect of it, the sites were all connected by cables. So when you went out to these remote farming areas, you'd see big ditches going all over the countryside where they'd put in the cables and filled them up. There was lots of redundancy so if an adversary went in and cut one cable, it wouldn't shut down the system.

RM: I'm curious - let's say you got a direct hit on a silo and there's a missile in there with at least one warhead on it, what would happen to that warhead? Would the plutonium or whatever be dispersed through the site?

CG: It would be dispersed, but it wouldn't go critical. The nuclear explosion from the oncoming missile would create some havoc but the missile itself wouldn't go critical. There are stories of military planes with live weapons that have crashed and dispersed plutonium. But, of course, nothing went critical. That's the safety of those systems.

RM: After Missouri, what did you next?

CG: My next assignment was back to the northern part of the United States, to Grand Forks, North Dakota. It was the same type of operation, hardening missile sites. At that time we may have been building the second generation out, longer sites called Minuteman 2. But this was still a hardening effort involving upgrades. After Grand Forks, we moved back to Lewistown, Montana for another year. Our second daughter, Cheryl, was born in Lewistown. We continued to upgrade the first Minuteman sites.

RM: Who was figuring out what had to be done with hardening? Was that the Department of Defense or was that Boeing?

CG: It was a combination of DOD and Boeing because Boeing developed and understood the design for the missile. A Boeing contractor, Parsons, was one of the designers, and they'd have their reps on site. They would be doing the figuring out about hardening. We implemented short-term fixes based on our engineering background.

RM: And all the time you're working for Boeing.

CG: Yes. While in Lewistown and Great Falls, they had an interesting educational opportunity with the University of Southern California - they brought instructors in for ten-week courses. I was able to obtain my master's degree out of the graduate school of business. It's called a Master's Degree in Systems Management from USC. My diploma looks as if I went to campus, but I didn't. It did involve travel. In Lewistown, I drove 100 miles twice a week each way to class. It was a great opportunity to work and get a master's degree. Of course, the company reimbursed us for the degree, not for the travel. When we left Lewistown, we went down to Cheyenne, Wyoming.

RM: And what year would that have been, approximately?

CG: That would have been '69. We were in Wyoming for a year at Warren Air Force Base. Same thing, upgrading missile sites, making them more resistant to electromagnetic

attacks. Then I went to Minot, North Dakota, up in central North Dakota, doing more of the same thing. And I had my same avocationsô did a little golf and softball. I enjoyed working and enjoyed the avocation time. While in Cheyenne I was able to ski more in Colorado, which I thoroughly enjoyed.

RM: Where did you ski, just out of curiosity?

CG: We skied at Steamboat Springs, mostly; that's one of the closest. But we also went to places like Vail and Arapahoe Basin. So I got introduced to what I'd say are the nicer resorts, the bigger resorts. In Montana when I started skiing it was at a place called Red Lodge, Montana, just north of the north entrance to Yellowstone.

RM: And all the time you're working on Minuteman missiles.

CG: All the time working Minuteman. Oh, Rapid City was in thereô I think we went from Minot to Rapid City, South Dakota. We lived near the Black Hills. Ellsworth Air Force Base was the base that was responsible for the missiles there. We enjoyed the scenery and tourist attractions of the Black Hills, places like Mount Rushmore. From Rapid City I think it was back to Grand Forks for a little whileô about a year at a time in all those places.

In Grand Forks, when Boeing was trying to expand, I was asked to work for one of their subsidiaries called BOECON (Boeing Construction). We were bidding as a prime contractor, not the overseer, to build anti-ballistic missile sites, ABMs. There were missile sites outside of Great Falls, and we were bidding to build anti-missile sites there. The theory was we were going to have ABM sites to shoot down incoming missiles, thus protecting our existing Minuteman missiles.

RM: And this was what year, roughly?

CG: This was roughly 1971.

RM: This was way before Reagan's going to shoot them down in orbit. This was to shoot them down when they were getting close.

CG: Right, coming close, on the trajectory. There were four or five proposed ABM sites in the country and I was the project engineer for this site. It was about \$17 million and we won the bid. My family hadn't moved to Great Falls yet, but I had found a house for us to rent, we had finally graduated from trailers to houses!

We started work immediately. About a week later, we were out on the site and the Corps of Engineers was delaying us from getting started. We had two contracts for two different ABM sites. We were working on one and we said, "We've got to get working on this other one." We sent our trucks over and just barely started to work and we heard, "We didn't give you the okay yet." We wondered what was going on. Then we learned that one of the SALT Treaties had been signed and the US and Russia decided to cut back on ABMs.

So using a contract term, we were "terminated for convenience." This was on Memorial Day, 1971. I had hired 30 engineers from around the country who were traveling that weekend to their new jobs. We had contractors that we had signed up to do our work. I remember one was a road contractor who had given up all his highway work in Montana to work for us because he thought he'd make more money.

I told my wife, "We're going to have to get out of the house because we're not going to be here very long. This is terminated." So we lived in a motel for two months. We'd just bought a washer and dryer; Sears took it back. It was a big headline, there were a lot of jobs up there that were lost. I stayed there for three or four months to help out with the termination process and then went back to Cheyenne, upgrading the Minuteman.

RM: So they let you come back.

CG: They let me come back. I came back in more of a supervisory role as a project engineer supervisor, then a project manager for the entire operation. My job was to assure the site was being upgraded properly. That was both Minuteman 1 and Minuteman 2.

RM: Minuteman was solid fuel, wasn't it?

CG: Absolutely. That's what made it very easy to deploy in remote locations.

RM: Whereas Atlas and the others had been . . .

CG: Had liquid fuel with associated piping that had to be monitored constantly. The Minuteman missiles just sat there. I was in Cheyenne for a couple years and thoroughly enjoyed it. In about '74, '75, it was back to North Dakota, both Minot and Great Falls.

CHAPTER THREE

CG: When I was in Great Falls they said, "BOECON has another job now. We're getting out of the missile business. We're going to build some nuclear waste processing facilities as a contractor for the Department of Energy in Idaho Falls, Idaho, at the Idaho Falls National Engineering Laboratory, INEL. So I went to Idaho Falls. We were only in Great Falls a short time, a month. I went out of the missile sites into the nuclear waste business, so to speak. It was a waste processing facility called the NWCF, New Waste Calcining Facility.

RM: What does calcining mean?

CG: It means take the waste, boil off the liquid, and what's left turns into powder. That's the bottom line - you calcine it. This was essentially a research reactor fuel. Idaho at that time had 52 research reactors at the Idaho National Engineering Laboratory, INEL. It was an AEC, Atomic Energy Commission, site. I went to work there and that was a great experience for me. We had absolutely empty ground. We started by digging the hole and then built the facility. My responsibility as a project engineer was to make sure we got it built and got it built on schedule, and on budget.

It was going to be about a four-year project but about a year into it, the Department of Energy came to me and said, "We've been watching your work as a contractor, as an individual. Would you like to come to work for the Department of Energy?"

I started thinking that it was time to settle down. My family was tired of all the moves. A nice federal job, a good engineering job, would be nice. I kind of liked Idaho. It was pretty cold, but I could ski more and play softball and golf. I started with BOECON

in Idaho in 1976 and after one year, in 1977, I left and went to work for the Department of Energy; it was called the AEC at the time. A week after I started working for the AEC, it turned into the Department of Energy in November 1977. That started my federal career, which I maintained until I retired as an employee of the Department of Energy in 2005.

RM: Were you happy about making the transition?

CG: I was unsure about it; it was a big step. But I liked the area and I liked the idea of a little more stability. If you're in construction, it is constant moving. I'd been experiencing that for 15 years. The kids were getting older; it was time to settle down. So we bought a house in Idaho Falls and became part of the community. For the next ten years, approximately, from 1977 to 1987, I worked for the Department of Energy on different nuclear waste projects.

RM: Could you describe some of the projects that you worked on?

CG: Some of the projects were overseeing the building of different facilities to reprocess different fuels. We had to build a facility to process a research reactor fuel that had a lot of carbon in it. It was called the rover-reactor, and we wanted to reclaim the uranium from it. We had to oversee the design. I moved from just building to total project management with the Department of Energy. You'd go to the designers and make sure the construction was correct. Then you'd hire a contractor, make sure the construction was correct. You'd see projects from the very beginning until they became operational. I also worked at the Idaho Chemical Processing Plant, which processed navy fuel.

RM: Was that submarine fuel?

CG: Absolutely, at the time. Now there are surface ships that are nuclear powered, but at the time it was mostly submarines. It was very cost effective then to reprocess the

spent fuel to reclaim the uranium as opposed to mining it because the fuel had a high uranium content.

RM: So you were reprocessing.

CG: We were reprocessing, absolutely.

RM: And doing it economically and effectively and safely.

CG: Clean and effective, right. It wasn't commercial fuel, which has a different composition, but it was either research reactor fuel or Department of Defense fuel.

RM: Were you reprocessing a lot of fuel or just small amounts?

CG: Small amounts.

RM: And now it will go longer?

CG: Now it goes longer—the life of a ship, as I understand it. I'm not that up on details now. I worked on some other projects there. I moved from nuclear waste into research reactors.

One project happened to be to design a 10-megawatt reactor, something very small but very compact that you could build in a remote area where you couldn't get any other power. While it seemed to be a great design, the anti-nuclear movement in the country was starting to take root and people were moving away from things nuclear. Three-Mile Island happened in 1979. That started people rethinking about going nuclear. We thought we were going to build one of these reactors at an air force base in Alaska and another in Mississippi, but the anti-nuclear sentiments contributed to killing it. Because of safety issues and other things, they just didn't go ahead with it.

RM: Were the safety issues real, in your view?

CG: In my view they were not real. Even during the event at Three-Mile Island, the safety of workers and the public were not compromised.

RM: And Chernobyl happened because they designed it wrong.

CG: Chernobyl was because of the poor design of a military reactor and, of course, operator error.

RM: So clear back in the 70s they were working on, for want of a better term, pocket reactors.

CG: Yes, they were 10 megawatt, very small. I mean, a normal reactor now is 1,000 megawatts. You put them in remote places. The air force was interested in that because they wanted to keep their bases operating. They didn't want to keep hauling oil in or whatever they had to haul in for the generators.

RM: And you were in charge of that program?

CG: I was in charge of the small reactor, of designing and building it. We didn't build any because we didn't get that far.

RM: But the plans are probably still there.

CG: The plans are there. They were called inherently safe, too, because if they overheated, they would just shut down without doing any big damage. It was a different reactor design.

RM: And did they have to be refueled or were they like a submarine?

CG: It would still be the more traditional kind that eventually would have to be refueled.

RM: What I've read about the little reactors is that they can take one into a remote area and just turn it on and it will work with no maintenance for years. Is that true?

CG: I haven't followed nuclear reactor developments, but that's the theory behind it.

RM: It sounds like you had it in a good state.

CG: We thought it would work. At the time there were lots of research reactors around

the country at different universities that were very small and were working fine. They were great for the nuclear engineering student.

RM: And the public wasn't getting radiated or anything.

CG: That's right. And because it was a research reactor, people didn't get concerned about it.

RM: That's really interesting. What were some other waste projects you worked on?

CG: I'm trying to think. As I said, it was mostly reprocessing, then building silos for the calcine. After it got calcined, you'd blow it into a silo and let it sit there. The theory was it would turn to glass and the glass logs would go to a repository. We worked on some of those intermediate steps before it went to a repository.

Another project that I started working on in the mid-80s was spent fuel cask research and development. The first casks developed and built and they're still standing, I believe, are at INEL. This project involved not only different casks that were delivered to Idaho, but the fuel being transported to Idaho from power plants across the country. That was a research and development project for the Department of Energy that was very successful.

Originally, they were going to do that down here in Nevada, which had a nice facility called Climax Mine and EMAD (a large hot cell). They had some spent fuel in there (the Climax spent fuel project) and they were going to expand that area. I was told that Idaho and Nevada were competing for this project. I believed Idaho didn't have the best facilities because we were more of a reactor research facility than a fuel storage facility. But evidently Governor Bryan didn't allow new fuel to come into Nevada in the mid-80s.

RM: So the anti-nuclear sentiment began early.

CG: In Idaho we did not have the best facility by any means, but they were starting to get state resistance in Nevada. I can remember in the beginning when we were researching places we came down to Nevada from Idaho to see their project and it was called the EMAD facility. They had built rocket engines there in the 1960s and it was a nice facility; we didn't have any such facility in Idaho. I believed Idaho was not going to win the competition.

We did have support from the Idaho politicians - they wanted the jobs there. But even though we had support from the Idaho politicians, the decision was made to implement that program in Nevada, and whether it was two weeks or a month or four months afterwards, we were told, "Nevada's not going to do it. You guys are going to have the project."

I was the project manager for that and it involved bringing in spent fuel and putting it in casks. That was one of the critical things - when it came in the transportation casks, we had to make the transfer to the storage casks. You'd need what they call hot cells, big buildings with thick walls where you did everything remotely working through lead-lined glass so no one would get radiated because the radiation fields from relatively fresh spent fuel were high.

I was working on that project and got it going and, in effect, completed it. We think that was a pretty successful operation because the utilities were able to build this type of cask and use them on site. There was no repository at that time and there still is no repository. At that time a repository was being studied, and they were able to put fuel in casks (dry cask storage) at their sites based on the experiments we did in Idaho.

When that project finished, I was asked to head a controversial project, the Special Isotope Separation, in 1986. It was very controversial because it involved making

plutonium for bombs. It involved a process where plutonium would, in effect, be vaporized to get a certain isotope of plutonium; I forget the number. A laser would go through it and that isotope would become attached to the laser. It would be separated and you'd get this plutonium isotope.

RM: Why did they want that isotope?

CG: Because that was the only one that would make the bombs be efficient.

RM: Oh, so you could take regular plutonium but it wouldn't be as good.

CG: It wouldn't be as good. This was a different way of separating plutonium as opposed to the plants they had at Hanford, which separated it in a different way, I don't remember all the details of that. This was lasers developed by Lawrence Livermore and this project was going to be built in Idaho; Idaho supported it. And it involved, as I said, taking plutonium that was being manufactured in a reactor and processing it so that we'd get the good isotope out of it.

It became very controversial because those in the NRDC, National Resource Defense Council said, "We have enough plutonium in this country. We do not think you should be building any projects for plutonium. We have all the bombs you want."

The departments of defense and energy said, "No. We need newer, better bombs and we need this facility to do it." This was in the initial stages and it involved several public hearings. I was the project manager and spokesman at many public hearings throughout the state. It was very front page, controversial. I got a lot of experience dealing with the public in Idaho that was generally very supportive of the project. There was a small element coming out of Sun Valley and other places that was absolutely opposed to it. The opponents were rallying the environmentalists and anti-nuclear element, although in Idaho it was a very small group. Overwhelmingly, the politicians all

supported it. So that became my job.

RM: What year was that?

CG: That would have been 1986 and maybe even early 1987.

RM: So Yucca Mountain was going when this was happening.

CG: Yes, and Don Vieth was the project manager. You talked to him, right?

RM: Yes.

CG: They were doing site studies. At that time there were three sites being studied for their potential for a nuclear waste repository. As you know, there was one in Texas and one in Washington. At that time one of the assistant managers from Idaho, Nick Aquilina, was named Nevada Test Site Manager for the Department of Energy. He was in charge of the entire Test Site, which included Yucca Mountain at the time. He came to Nevada, I believe in early 1987.

Let me go back as an aside. While in Idaho, I also picked up another avocation, so to speak, or hobby, and that was officiating high school basketball and football.

RM: How did you get into that?

CG: It's a very simple story. One of my daughters, Charlee, was on the dance team. I went to a couple of her events during ball games and I watched the officials. One of the basketball games happened to be a tight, one-point game, and I questioned a call they made. One of the people I worked with was one of the officials. I said, "Boy, I don't think you got that right."

He said, "I think I got this right."

So I went to the booster club meeting, saw the film, and he did get it right. I said, "You know what? You did get that right."

And he said, "Why don't you try officiating? Maybe you'd like it." So I tried high

school basketball first and I did like it. By the time I left Idaho, I officiated at some of the top games in high school and junior college football. I started about 1982. By the time I left in 1987, not to brag, I was probably one of the top officials, particularly in football. I was a better football official than basketball.

RM: You have to know the rules inside and out, don't you?

CG: You have to know them all. So in 1986, I was heading a controversial project and sometimes working controversial athletic contests—basketball and football. Idaho Falls is a small town. You'd see people in the grocery store and they'd ask you, "Why did you make that call? That was a terrible call," or whatever.

Anyway, then in about July or August, Nick Aquilina called me and said, "We're changing project managers here in Nevada; would you be interested in being the Yucca Mountain project manager?" The people in OCRWM, Office of Civilian Radioactive Waste Management, knew me a little bit from the spent fuel projects. Although I hadn't worked on a repository, I had worked on some of their projects, spent fuel and transportation casks.

So I said, "Sure, I'll try that," so I came to Nevada.

RM: And what year was that?

CG: This was in August of 1987.

RM: And that would have been right about the time of the so-called Screw Nevada Bill, the amendment to the Waste Policy Act.

CG: It was four months later. I came down here and I was starting to become acclimated to the project. Certainly it was a different environment than where I came from because here, most of the citizens and politicians were absolutely opposed to the project, whereas in Idaho, the citizens and politicians were supportive of INEL projects.

RM: Why the difference between the politicians and the public perception of it?

CG: It's a hard thing for me to figure out because when I came here, I knew they had blown up a lot of bombs on the Test Site. They had a lot of contamination that was general knowledge. I believe it became what I would call a classic demagogue issue where they'd say, "Vote for me and I'll keep this stuff away from you. Just vote for me and I'll keep this stuff away."

RM: I interviewed Senator Chic Hecht, and that's what he said.

CG: I am convinced it was a demagoguery issue, and it gained the momentum it did because the people who talked that way kept getting elected, so they couldn't change their position. Whereas in Idaho, it was more of a jobs issue. And people said, "Wait, these guys have been here a long time. We trust what they're doing." We had not had an accident. We have 53 reactors working in the Idaho Engineering Lab. Actually, even those who were opposed to the latest project in special isotope separation were more opposed to the wartime aspect, the bomb-making aspect, than they were to the nuclear processing aspect of the project. They just didn't want any more plutonium, per se no more bombs.

I have to go back to one more incident in Idaho that is certainly worth noting. One day I got a personal letter at DOE. It said, "You should be ashamed of yourself." I don't remember all the points in it. "As a project manager, you'd be killing babies. You will kill kids. And I will kill you." I turned that over to security and they got the FBI involved. The gentleman who wrote it wasn't too smart he signed his name.

I was going to a public meeting at that time in Twin Falls and this message came from Sun Valley about 60, 80 miles north of Twin Falls. I was leaving and security told me, "We've tracked this guy and he's bought a gun. We know who he is. You need to

wear a Kevlar vest. We've got everything covered. We've got the FBI, we have DOE security, but you're going into an area of Idaho where the anti-nuclear components are more visible than in Idaho Falls.

I went there and I had a Kevlar vest. They said, "We have him spotted in Sun Valley, 60 miles from here. If he starts heading this way, we'll let you know so you can decide whether to put the vest on or not."

I said, "I'll go without wearing it, but do let me know if he heads down this way."

But there was no incident and they had him. Now, whether they prosecuted him for making threats, I don't know; I didn't follow up. But it was interesting.

RM: What a story. When did Idaho first get involved with nuclear research? Was it after the incident in Washington at Hanford?

CG: Yes and no. Idaho had the first research reactors for making electricity. They were not necessarily a defense facility. They were not like Oak Ridge or Hanford, where they were building nuclear things for defense. INEL was more research-oriented: What were we going to do with this nuclear thing? Could we make electricity? Could we make medical isotopes? Could we make better reactors for the commercial side?

RM: So theirs was a civilian experience early on, whereas Nevada's was shooting off A-bombs on the Test Site.

CG: Yes, for the most part. There was one facility called the Naval Reactor Facility where they trained submarine operators to work reactors; they had a real reactor. But the other reactors were things like the Advance Test Reactor.

RM: I've wondered for years how Nevada got so goofy about this. There's got to be an underlying dynamic—cynicism on the part of the politicians is probably a major factor.

CG: I use the word "demagogue" a lot because it's apropos. It was the way to get

elected. You could not be for a nuclear waste repository because you would lose some votes. One, two, three, four percent might mean the difference between getting elected or not.

RM: I was here then and followed the issue from the very beginning, and the opinion on the Yucca Mountain repository was very open in the beginning. I was at the very first meeting that DOE had and Governor Bryan came in with great pomp and circumstance with his entourage and announced he was unalterably opposed to it. I wondered, "Why is he using a word like unalterably?" I asked Chic Hecht about that. I said, "How did he know that this was a good issue to use politically?"

He said, "Fear always makes a good issue for a politician."

CG: You said it better than I could. That's what it was - it was fear. "We'll protect you from this unknown fear. Don't worry about it. I don't have to tell you what that the danger is, but I'll protect you from it. You don't have to understand."

RM: And he could build on that because Nevada, as you say, didn't have a civilian focus on nuclear research in the beginning.

CG: That's correct. It didn't have a civilian element. So I was asked to come down here and I said, "Sounds good." My family moved into a house at the Lakes and I became an integral part of the community. I started officiating right away - a very friendly officiating environment welcomed me. I was doing top high school and junior college games in the fall of '87, including Dixie Junior College games. I was also going to California doing some Division 3 games.

RM: And you were getting a lot of pleasure out of it, right?

CG: Getting a lot of pleasure and getting acclimated to the new job. Certainly, I was a new project manager here; hardly anyone knew me when I came here other than my boss,

Mr. Aquilina. I tried to use my skills as a manager to run the project and also interact with the public to earn their trust. I thought I had very good qualifications for the job.

CHAPTER FOUR

RM: What was the status of the project when you got here? What did you find when you put your boots on the ground?

CG: When I got here, I found a very good scientific staff. But in my opinion, they hadn't communicated very well.

RM: Do you mean with each other or with the public?

CG: With the public for sure, and as I viewed the internal operation, perhaps everybody wasn't being a team player. There were scientists, engineers, environmental regulator-type people, all working on the project but not working as well together as they could. That was my first assessment. I've always been a team-building type guy anyway, so I started trying to take steps to improve that. I'm not saying it was bad, but it looked to me like it could be improved.

And certainly I was always comfortable working with the public. I was under the philosophy that the public didn't want to hear from a spokesperson, they wanted to hear from the project manager. Even in Idaho people would say, "Well, let's send the public relations people."

I'd say, "No. They want to hear from the project manager." That seemed to work in Idaho and it seemed to work on many projects across the country that I'd researched.

Initially, as Yucca Mountain project manager, I started to develop relationships with my staff because, as I said, they didn't know me. And I purposely began integrating myself into the community. At that time, we were one of three sites being studied as a repository site. I remember going to several national meetings in October and November and December where we had the Texas project manager, who I had known a little bit, and

the Washington project manager and myself and our support staff. The meetings were about which place was going to be the best site. There was always scientific talk and friendly debate.

RM: How did that debate go? What were some of the pros and cons for each site?

CG: The basic ones were that salt is nice, and the site in Texas was in salt but salt doesn't have the structure; it seems to move after a while. That would make it difficult and make the waste irretrievable. Nobody knew much about Yucca Mountain outside of Nevada. The people who had worked here did a great job in characterizing it well. They had figured out it's a pretty good place. And the state of Washington said, "Well, this is a big nuclear site. Don't worry about it. The public will support it." The potential site was in hotter rock, which would be difficult to work in temperature-wise. It may not have been as good as the tuff rock we had at Yucca Mountain.

I was assessing the situation those first four or five months, and concluding that we really did have the best place scientifically. I listened to my staff, listened to everything going on. I figured we had the best scientific site so let's go through the process and put our stuff forward. Then before Christmas, we had a big meeting in Hanford with all three teams. We were all taking a tour of the Hanford facilities and all of a sudden we got a call that said, "Things are happening in Washington. There may only be one site." I wondered who's Nevada? And certainly, it was Nevada.

That was the "Screw Nevada" Bill. That only generated more opposition in the state because now not only did the politicians have the fear factor, they could say it's 49 states picking on one. So now you have the policy issue of 49 against one, the little guy, and you have the common fear of things nuclear. Anything nuclear can create fear just in the perception of the public. I'd probably use this statement a couple more times in this

interview perception is reality.

RM: Yes, absolutely.

CG: Suddenly we were the only site in the country. I am not sure how this was accepted by the Texas or Hanford employees. The Hanford DOE people probably had other jobs but the DOE people in Texas did not.

RM: They were out of work?

CG: They were out of work. They eventually got transferred to work on other projects within the Department of Energy. Now, here I am three months on the project and we were the one site. We became a national program.

RM: Do you think Congress made a mistake in passing the 87 Amendment? Should they have maybe let the decision process run its course? It probably would have led to Yucca Mountain in the end, right?

CG: I personally do not think they made a mistake. They saved money and accelerated the process, which was going to be inevitable anyway. But I don't think they were aware of how much political opposition there was to it. I think if they had been aware, they might have added things to the law that would have exempted the project from some state permitting and allowed some federal permitting that would have enabled us to move a lot faster.

RM: Do you think them passing the amendment that way fed the flame of opposition, though?

CG: Absolutely, it did feed the flame of opposition. This is all hindsight, but I did think at the time, "They made some things easier but they should have made it all easier. If they are going to feed the flame, let's go all the way and let's help make it happen." I don't think they realized how states' rights and regulation could become involved. It was

obviously a fairly quick decision; if someone at DOE had an inkling that it was going to happen, they never shared it with me. I mean, it came out of the blue because we all thought there was going to be scientific evaluation of each of the three sites and at the end of the evaluation a scientific decision would be made as to which site would be chosen. So that led to, as you said, stepping up the opposition.

RM: Yes, it gave them something else to complain about.

CG: Yes, without question 49 against one and everybody loves an underdog in any environment. Everybody picking on me, etc., etc.

RM: What was your thinking? You come down from Idaho, you're here a few months, and all of a sudden, bang, you're in the big picture. Personally, how did you adjust?

CG: Personally, my focus was, "This is good. Now I don't have to worry about competition and trying to justify the site scientifically against another site. I just have to make sure we're safe." My mantra from the beginning was "If it's not safe, we don't want to build it." We were chosen by Congress. That is the law. Let's go implement the law and let's make it safe. If it's not safe, we tell Congress it's not safe. We have the same scientific approach that we had before: make sure it's safe. But we don't have to make it safer than another site or worry about these other sites. We're the only game and let's just go make sure what we're doing is correct.

RM: And at this point, the federal government failed to sweeten the pot. There were covert approaches made: a super train, a superconductor supercollider, a big research center on the Test Site, on and on: but these were never publicized, never put out front for the public. What do you think about that and what would have happened if they had sweetened the pot?

CG: Well, the Act did sweeten the pot very slightly with a \$100 million offer.

RM: Which is chicken feed.

CG: Yes. Later on, I'll talk about that \$100 million that they were offering.

RM: That's still chicken feed.

CG: That was 10 percent of the state budget at the time.

RM: But they should have been talking billions.

CG: I do not think Congress realized the well-thought-out opposition that they would encounter. I do not think they realized how much they would have had to overcome to get the public on their side. I think they thought, "Well, they're building bombs and it's kind of remote." I can't get in their minds, but that's my view. "If you can blow up bombs in that area, they're not going to fight this too much. It's jobs, it's good. It's good for the country." Had they been really forward thinking, they might have said, "We'll give you two research projects and something else." That just didn't happen.

So all they offered was a very minor benefit; I agree with you. We also had some oversight funds, which turned out to be pretty good, and a nice opportunity for Nye County with the payment equal to taxes.

RM: But that didn't have the potential to override Governor Bryan.

CG: It did not, ultimately. About that time or shortly thereafter in conversations with Bob Loux, the then head of Nevada's nuclear waste agency, I would ask him, "What's your problem? We're going to do good science. If it's not safe, we don't want to build it."

And he came up with one of the quotes that I have used. He may or may not admit to it, but his quote was, "There's no right way to do a wrong thing." They viewed this as being a wrong thing because it was nuclear-based waste, the fear of nuclear, or it was a wrong thing because it was 49 against one. Either way, they thought it was a wrong thing. So no matter what we did, they were going to be opposed to it.

RM: Bob Loux told me that from the beginning their strategy was delay and obfuscation.

CG: Oh, sure. And it was a great strategy.

RM: Governor Bryan told me he did not trust DOE because of the experience of the down-winders with fallout from testing. But I wonder if it was really a political decision.

CG: To me, it was a political strategy. It got him elected. And people who came after him got elected on that single platform— opposition to Yucca Mountain. I can't recall, of course, all the things that went through my mind 20 years ago, but that was my focus: "Let's go do it right. Let's move on."

What became a focal highlight of the opposition to the project came a couple weeks after the decision was made, just after the first of the year, the beginning of '88. I found out that one of my scientists, Jerry Szymanski, had said, "It's not a good site." So now here I am, the project manager, and I have an internal scientist who says it's not a good site. I also have a bunch of scientists who say, "No. It's a good site. We just need to do some more study. We'll be okay." But somehow Mr. Szymanski goes public with his position. I don't know the exact day, but somewhere around the first two weeks in January, this gets out and I have 14 local and national reporters wanting to talk to me on TV, etc.

So I strategize how we're going to handle this. I talk to my scientists and my public affairs people and I say, "I'm going to go out and say we're going to examine this. If this is true, then we don't want to build here. I respect a differing scientific opinion. We're not sweeping this under the rug. We're going to put together some panels to look at it. There are differing scientific opinions. We're going to treat it as a differing opinion and go study it." That's the approach I took from the beginning on a very controversial

project with a controversial scientist. And Jerry's very credible looking. I don't know whether his background's credible, but his presentation is very credible.

RM: What was going on with him?

CG: I think in his mind he thought he was doing the right thing. But he wasn't open to someone discussing an opposing view with him. He was pretty focused on his idea being right.

RM: So he was persistent on his view.

CG: Yes, and I think he became more persistent as time went on.

RM: Was there any possibility of some kind of payoff?

CG: That's a good question - what was driving him? Certainly, I think he liked to be respected as a credible scientist. He maybe liked to be respected as a whistleblower, although I didn't view him as a whistleblower. I viewed him as having a differing scientific opinion, and that's the way we tried to treat it. One of the telltale things that came to my mind is that the state, particularly Bob Loux and all, didn't jump for what he said hook, line and sinker. They just said, "There are differing scientific opinions."

And don't forget that after 1987, the government did not present Yucca Mountain as the site for a repository, but as the only site to be studied.

RM: That's an important distinction, yes.

CG: Very important. We were not a repository. We were just a site to be studied. If it wasn't safe, nobody was going to build it.

RM: But the opposition portrayed it as "the" site.

CG: Yes. And unfortunately, we couldn't deflect that opposition because they then would switch, as we've talked about, to the fear demagoguery and to the underdog issue of 49 states against one.

But getting back to Mr. Szymanski, after we're announced as the only site to be studied, he comes out with this theory that perhaps Yucca Mountain has some upwelling water in it although the great majority of scientists on the project think all the water is going from the surface down to the water table, which is very far below ground.

I personally tried to take the high road since Jerry's a credible scientist and said, "We're just going to look at it, whether it's going to be years before we come up with a definitive answer. We've got to get out and study the site. Do some digging and things like that. And we're a long ways from that, so we will look at what we have and continue to study it." That was my thought process.

You asked what I think Jerry's motive might have been. I think he viewed himself as a scientist and he was convinced this was the correct interpretation of the data. I think he was just thinking, "This is the science and this is the way it is." There's an interesting article I don't know if you've read it in the *New York Times Magazine* section that ran about six pages on this particular issue and featured Szymanski.

RM: When was that?

CG: About maybe six months to a year after he came out with his theory.

RM: Was it authored by Szymanski?

CG: No, it was authored by Matthew Wall, a nationally known science writer for the *New York Times*. Szymanski was viewed by some as credible and by some in the scientific community as being off the main stream in his interpretation of the data. As I said, the state, while certainly they picked it up as another issue for opposing Yucca Mountain, was not jumping on the scientific part of it as much as I thought they might. However, I'm sure they were happy to see differing scientific opinion and disruption in the project because that only fueled their strategy for, as you said, delaying or putting

things off.

RM: Did it actually delay it?

CG: I do not think it delayed it. It certainly took some resources to address it, but more delay came with our inability to get permits. And changing the design as we went forward, which I think was the correct thing to do, delayed us a little bit. But mostly everywhere we went, the state just delayed our process. We couldn't get a permit for water, we couldn't get a permit for this, we couldn't get a permit for that.

So that sets the stage in effect for January of 1988. We are the only site to be studied. There's a groundswell of opposition in Nevada based on being picked on by Congress, and being the only site to be studied. The perception in Nevada was that the power resided in Texas and in the state of Washington and Nevada didn't have political power and therefore, that's why they were singled out. So in January it became a national issue. We were the national site to be studied and we had the internal issue of Mr. Szymanski's report of upwelling water.

I welcomed the scientific examination of Szymanski's idea - we were never trying to hide anything. The issue went on for about two or three years, finally being studied by the National Academy of Sciences. I had set up an independent board outside the project - a couple of scientists that he chose, a couple of scientists that I chose, and a third one chosen by someone else. Certainly I did have the choice of those three but all five were recognized, independent national scientists not involved with the project. They studied it for about two, two-and-a-half years finally deciding that the theory of upwelling water wasn't a credible theory. Now, Jerry probably still believes it is a credible theory but the scientific evidence does not support it.

It took us a while to gather some of that evidence. We weren't able to do field

studies because the state was not giving us permits to dig dirt or to get water to keep the dust down at what they would call the injection well. We wanted to drill some wells to see where the water table was and to examine the geology.

RM: And they wouldn't let you do that?

CG: The state would not let us do that and they were very aggressive at it. Now, I'm sure the professionals in the departments in the state—whether it was the state engineer for water or the environmental health and science people—didn't have any problems with our application professionally. But certainly they received pressure, in my opinion, from the governor's office to just delay. As we've said, one of the state's methods of opposition was delay, delay, delay. They were able to rationalize any of their delay activities by just saying, "There's no right way to do a wrong thing."

RM: What were some of their excuses for not allowing the permit?

CG: There's just no right way to do a wrong thing. Now, excuses that the staff would give us were things like: "Oh, we're studying it. We have more studies. Give us some more data." My engineers and I made several trips to Carson City to talk to them. The staff itself was always very professional but I think I could read between the lines. Just down the road from us, they would give the mining companies permits to disturb much more land than we had and also use chemicals to leach out the ore at Beatty. So they didn't have a good professional or scientific rationale for not issuing permits.

RM: So they were mining at Beatty and, of course, using cyanide.

CG: Cyanide is what they used, absolutely, and using the water and open-pit mining. They were disturbing huge amounts of acreage in open pits in the Beatty mines.

RM: Whereas yours was on a government reserve.

CG: Ours was on a government property. We just wanted to drill holes and withdraw

water from the same wells they were using for the Nevada Test Site. We wanted to use it for Yucca Mountain purposes, and they didn't believe that was right. Finally we went to court, and as you can see from some of the newspaper articles, the federal courts said they didn't have a basis for withholding the permits.

If I recall, the strategy would have been, "All right, state, if you're not going to grant us permits, we're going to go to EPA, who gave you the right to give us permits and say, "You are not establishing fair ground for everybody." So they would retract your right and we'd get our permits from the national EPA."

The state, I think, wanted to keep the responsibility for granting permits within their domain so they finally yielded. After about two-and-a-half years, they started granting us permits. But during that time, we had some interesting activities. The first permit I believe they granted us was that we could dig a ditch to disturb the earth to examine faults but we had to have a clean air permit. And in that permit we needed to keep the dust down, but they wouldn't give us the water to keep the dust down.

I came up with an idea that we would haul the water in from Amargosa Valley. So we bought some farmers' water there. The Amargosa Valley farmers got pressure from the state saying, "You ought not do this."

So while they made some money on it for a while, they felt pressured and finally told us, "We can't sell you any more water." So then we went to California and we hauled water in in tankers. We built big storage tanks and our trucks would go up, get the water out of the tank, and dust down the roads and so forth.

RM: Where were you hauling it from in California?

CG: I don't know exactly, but just outside of Amargosa Valley, just across the border. It was the shortest distance we could find, essentially. Finally the state did relent and

gave us a water permit because probably they were losing the public relations battle.

RM: Is that water episode kind of a microcosm for the whole thing in a nutshell?

CG: Absolutely. Once again, back to their strategy of delay, delay, delay.

RM: It's rather disgraceful performance.

CG: Yes. Once again, I certainly don't believe it was the individual staff members in the state departments. It was pressure above them saying, "Do what you need to do to drag it out and drag it out," until we finally had to go to court.

RM: And the federal courts then gave you the right?

CG: The federal court system gave us the right to say that it was legal for us to have a repository. In their original delays the state was saying, "You need to have more data." Then after we had more data, I believe their answer was, "It's still being viewed; we don't think the law designating Nevada was lawful." The Ninth District finally ruled on that.

CHAPTER FIVE

CG: So that was an interesting sidelight, but that let us get started drilling so we could understand the geology. We also did the scientific excavation needed to look at Mr. Szymanski's theories as well as many other theories as to whether the site would be safe. So we had a lot of activity going on.

RM: And you said the National Academy of Sciences became involved?

CG: The Department of Energy had asked them to become involved: "Now you have the Szymanski theory. You have a review of it by an independent panel" set up by the Department of Energy, but still independent. Let's try to put it to bed with the National Academy. So a 17-member National Academy of Sciences committee looked at it and they came up to the conclusion that it wasn't a credible theory.

RM: As an aside, you can't get any more prestigious than the National Academy.

CG: I would think not, but the state accused them of being politically motivated. At the time of the act that designated Yucca Mountain as the only site for study for a waste repository, Congress also created a Waste Technical Review Board. That was another independent board, and I think they had 12 or 16 scientists. So all these boards reviewed the Szymanski theory, as it's called for short, and they said it was not a showstopper. He said that the calcite, calcium, calcium carbonate, whatever we saw in the trenches (the same type of calcium watermarks you see around the edge of a pool) was the result of water coming up and then dropping down; his theory was upwelling water. If he had been right, that would create some issues for the repository because water transports radionuclides. If there was water in that area, which is still 1,000 feet above the current water table, we'd have to think about whether this was the right place to build a

repository.

RM: Did Szymanski have any other issues that were basically obfuscating for the whole effort?

CG: No, not really. That was his theory. We had a couple of other scientific theories that we had to work hard to obtain the needed scientifically based information about. One was volcanoes, because there were some volcanoes in the area that were dormant.

RM: What was the project's take on the volcanoes? Because there's that little volcano off Highway 95.

CG: Absolutely; that's the one you can see from the top of Yucca Mountain. Our take was while those volcanoes did occur, they were very slow-acting and they weren't in Yucca Mountain. We could find no evidence of volcanic activity in Yucca Mountain. We could find it out in the flats but we couldn't find any activity close enough to damage Yucca Mountain. We didn't believe there was a dormant underground volcano that would come through the mountain. While it might come out in the valley near Beatty, it would not come out under Yucca Mountain.

RM: Were there any other scientific issues you had to deal with?

CG: Those were the two big ones—volcanoes and water. There were others with the rock. Once we built tunnels, would it be substantial and stable?

One other thing became an interesting sidelight to the project. Six or eight months after Congress designated Yucca Mountain, a miner or miners from Beatty came out during a weekend, maybe even at night, and staked some mining claims on top of Yucca Mountain. This now became a real issue.

RM: Yes, because DOE had failed to withdraw the site from the public domain.

CG: That's correct. I think he was able to put his claims in a week or two before we

could do that.

RM: I think Bob Perchetti from Tonopah was one of them.

CG: You have the correct name. Mr. Perchetti did put claims in, but then there was the requirement that he had to work the claims to keep them valid, and of course he couldn't get to them because the land was on the Test Site. He and I talked and I gave him permission and authority, with people escorting him, to go up and work his claim; I wasn't going to hassle him. But all along, I told him I didn't think his claims were going to be valid because Congress had designated the site to be studied, and Congress's designation would trump his Mining Act of 1872 claim. So that discussion went on for a while. Then it appeared to me that maybe the best way was to try to buy those mining claims from him.

RM: And do you think that was intentional?

CG: Many people say this group had a history of putting in mining claims, whether for railroad right of ways, schools, or anything else, to try to get them bought out rather than to mine them. But whatever the motive was, what he did was within the law at the time. And rather than have a long, drawn-out litigation about the Mining Act of 1872 versus the Yucca Mountain Repository Designation Act, the Waste Policy Act, I entered into some negotiations with him. We sat down, just he and I, one on one, and I had authority to go so high with the buyout and we were able to buy it from him.

The next day I had a check in hand and we went down to the BLM office. Before he took the check, he signed over the mining claims to us at the BLM and he got the check and left town. Therefore, the mining claims were signed over to us and that eliminated any possibility of mining. There was someone else who later put some other mining claims on it.

RM: I forget his name.

CG: I believe we settled with him, but for a much smaller amount of money.

RM: Because he didn't have as good a case?

CG: Yes, his claims weren't in the right spot but were certainly going to be a nuisance. We could have lived with his if we wanted to. It wasn't as good a case as Mr. Perchetti's, whose claims were in the right spot at the right time.

RM: Yes, he knew what he was doing.

CG: He knew what he was doing; without question. What does surprise me is that I imagine he could have dealt with the state— maybe they would have bought the claims from him. I don't know what the politics would have been then; we still would have had to fight it in court. That's why I thought it was important for me to make him a substantial offer of a check, and say, "Let's deal with this now. We don't have to go through a court fight." I thought he would lose in court.

RM: Because he did it after the designation.

CG: That's correct.

RM: It was very clever.

CG: It was a very good strategy, and obviously he made a little bit of money from it.

RM: I remember talking to an Amargosa Valley farmer about it before Bob Perchetti did that, because it was in the paper that the land hadn't been withdrawn.

CG: That's correct. We had to get the land withdrawn. And he may have had some partners or whatever. As I said, my strategy was, "You might win in court, but it may take you lots of years. I doubt if you'll win because of the designation by Congress." So he did take a quick settlement. It was an interesting negotiation— it was just he and I sitting at the Peppermill, as a matter of fact, on the Las Vegas Strip.

RM: That's a good story. In a way, it's a story of American enterprise, isn't it?

CG: Absolutely. I was pleased that I didn't have to get a lot of lawyers involved. DOE headquarters gave me the authority to make the deal at the time. And that helped him make a decision because it was a check in hand right now.

So that was interesting. Then we went on with the scientific studies. We got our permits and lots of studies were going on. Certainly there was a lot of political posturing within the state, as we've said. Once again, they would try to base their opposition on either the 49 states against one issue, or on the site being a bad spot based on science.

RM: What are some of the actual scientific issues you were dealing with— not because you were forced to by people like Szymanski but because you saw them as a part of the effort?

CG: What was required by EPA regulations and what we believed was required by the NRC standards was to collect a lot of data to determine where the faults were and what action they had, determine where the water table was, determine the possibility of water coming down from rain, in relation to 10,000-year climate changes. We had to conduct a lot of studies and construct a lot of models.

Of course, models are based upon scientific data. Then you have to make some assumptions in the long term. It appeared to me that that was always going to be a challenge because how can you predict what will happen in 10,000 years? You know what happened in the past 10,000 years, but that doesn't mean the same cycle will happen in the next 10,000. So that, it appeared to me, was always going to be a challenge as we went through our licensing process and even into litigation. Because should licensing have gone forward, I think the state would litigate a successful license.

RM: And then they changed the rules, didn't they? They made you have to model out

to a million years, which was absurd.

CG: Exactly. We always thought 10,000 years would be tough. My theory was, "Let's not ever cover it up until the state says it's okay." First of all, we had to collect a lot of data, and then we had to prove that the site would be safe for 10,000 years, which was difficult. Then the National Academy of Scientists got into it a little more and Congress asked them, along with EPA, to come up with a different standard and they came up with either 100,000 or a million years. I forget what it was but it was a very long time, which made it even more difficult to predict a model, but we still thought we would be able to do it. It took the EPA a long time to establish that standard, well after I left the project.

When I came to the project, one of the designs had been to have two vertical shafts and then connect them. Then we would look at the rock from underneath and maybe do some tunneling. That was called the Exploratory Shaft Facility. The Nuclear Waste Technical Review Board (NWTRB) was one of the oversight committees created by Congress in the Nuclear Waste Policy Act of 1987, and it started reviewing things. They said, "You know, we're not sure that those shafts are the best idea. Maybe you ought to dig a tunnel into the side of the mountain," because there happened to be some very intelligent advocates of big tunneling on that board.

I was a civil engineer and I knew about big tunnels. I came from Chicago where they had huge tunnels underground to handle storm water. So that started to make sense to me. We did change our design based on input from the NWTRB to go away from the shafts and dig what we now called the Exploratory Studies Facility as opposed to Exploratory Shaft Facility (it was still ESF). We then started laying out plans for a five-mile tunnel that would go in the mountain, turn around, and come out the other end of the mountain. I thought that was going to be a great idea.

The other idea I tried to emphasize was, the law said, "At least be open 300 years before you can seal it." My theory was, let the state tell us when to seal it. If they had a problem, they could walk up and down the tunnels and look at things. If they didn't want it sealed, we could take the stuff out in a fairly short time. I thought perhaps that might mitigate some of the opposition but it really didn't because they were opposed to the repository under any circumstances. But that was one of the theories - just, "Let's build the tunnel." There would have been 100 miles of tunnels eventually for the waste. But first build a tunnel and let people look at it. That seemed to work for a while.

RM: You were talking a big bore?

CG: Yes, a big boring machine. A TBM is what they call it, tunnel-boring machine. So we agreed that we should have a tunnel. Then it became a scientific discussion within the project, "Well how big should it be? 18-foot? 12-foot? 25-foot?" I had a debate with the scientific board. They wanted a smaller tunnel, so we started doing some studies on that. We actually went over and looked at the English Channel tunnel. I believe in that tunnel there are two 25- or 30-foot tunnels, and then some smaller tunnels along the side for ventilation.

As we talked to them and talked to their engineers, it appears they did have some tunneling accidents but most of them were from people getting caught in the transportation of things in and out of the tunnels, and they were all in the small tunnels. So I decided, with help from my engineers, "Let's just build a big tunnel. Let's build a 25-foot diameter tunnel. We can get a train in it." I looked at some of the history of tunnel boring, and once you get started, it doesn't take that much more to move a machine with a 25-foot diameter than an 18-foot. It's about the same amount of time for the machine to move down the path.

So we decided to go with the 25-foot tunnel. The board did not like that as much; they thought we were wasting money. But it prevailed, and I'm sure glad it did because there have been no serious casualties in the tunnel, and it's been open now for 15, 20 years. It's not being used at all now, but during all the time of scientific examination, there was plenty of room for people to get by and plenty of room for scientific exploration.

After I left, I believe they did do a smaller tunnel underneath the big tunnel to look at other things, and there were side tunnels that may have been smaller. But the major tunnel served its purpose very well, I believe, for scientific exploration and for the safety of the workers.

RM: Was the big tunnel lined?

CG: The rock was so good, it didn't have to be lined after the first couple hundred feet. We started with just drill and blast and put in shoring— as you call it, lining. I don't know the next details but 200 or 300 feet of shoring was all we needed. Then it went right through a couple of faults and everything.

RM: But that top was so hard it just stood up there?

CG: People talk about the strength of concrete. Good concrete maybe is 2,500 to 3,700, 5,000 psi concrete. Well, this stuff was about 10,000 psi; it was really tough.

RM: Better than good concrete.

CG: Better than good concrete. Now, it does have a little bit of fracturing, of course, but no significant fractures that would cause any safety issues. They weren't rock falls. There wasn't anything falling off the ceiling.

RM: Which speaks well for the site itself as a repository, doesn't it?

CG: Absolutely. I mean, that was our big selling point after the tunnel became

complete: "Come on out and look at the tunnel. Here's five miles you can walk and go as fast or slow as you want." Then the scientists said, "Well, we need a few more tunnels;" that was after my time. But they did a lot of investigation of any area of interest off that five-mile tunnel. We put heaters in the rock. I mean, we had all different experiments.

You asked about other challenges. One of the other scientific challenges was to know, if you heated the rock, how would it behave? Because nuclear waste does give off heat, no doubt about it. So what structural deficiencies would the heat cause the rock? They put high- temperature heaters in there and as they studied it, the heat didn't seem to have any significant effect. So well after I left, they went ahead with the license application.

RM: They started preparing the application then. Up to then, they weren't preparing the application.

CG: No, in my time, we were gathering data that would be used in the license application, but it wasn't a formal application. Under my watch we prepared what we called a site characterization plan (SCP) that was the gathering of data. If the data looked good, then the project would take the next step and prepare a license application. Then by law Congress and then the president had to make the decision as to whether it was a suitable site. They did that in 2002. The SCP was a massive document, thousands of pages, that contained the data that could ultimately prove the suitability of Yucca Mountain as a repository site. We were all very proud of that document.

RM: There's a couple of things I'd like to get your take on. When I interviewed Chic Hecht, he told me that when he was serving in the Senate, Secretary of Energy Herrington called him into his office one day and said, "I want to talk to you about an offer that we'd be willing to make to the state of Nevada. We will build you a multi-

billion dollar research facility on the Test Site associated with UNLV for the study of nuclear medicine and nuclear issues. In a few years, you'd have more Nobel Prize winners working there than at any institution on earth. I later confirmed this offer with Troy Wade; Troy told me he was there when the offer was made.

Chic came back to Las Vegas and the first person he talked to about this was Bob Maxim, who was president of UNLV at the time. Maxim told him, "If I signed onto this idea, I'd be out of here the next day." The offer was dead on arrival. Would you think something like that happened?

CG: That sounds absolutely true. I'd give you another story about an offer that was dead on arrival. Anybody who was nominated by the governor, or worked for the governor, who hinted at supporting the repository, was in trouble. I knew Dr. Maxim; his university did scientific studies at Yucca Mountain.

At one time the state did not want university scientists doing any studies at Yucca Mountain. Then academic freedom did prevail, and they were allowed to do it. At one time, I was called by Bob Loux and he said, "Let the Los Alamos and UCLA or anybody else study it; we don't want our state scientists studying the mountain."

But eventually, we were able to get Jim Gruen from the University of Nevada, an earthquake scientist, and other UNLV people. We said, "We're not asking them to say whether it's good enough. We're just saying, 'Collect the data and tell us what the data is. Tell us what the science is.'" So after a while, I think the state backed off because they didn't want it to get into the press that they were not giving their Nevada scientists a chance to work.

What you're saying is consistent with that. That would be a big offer, and that would be appropriate, but you couldn't get anyone on the state to sign onto it. And if any

other politician agreed, he would unfortunately lose that swing vote and the election.

RM: And there's another story of a big offer, or offers. Steve Bradhurst, who was Nye County's nuclear waste person, interfaced with a big person at the Nuclear Energy Institute, NEI. He said, "What would Nevada take to accept the repository?"

Steve said, "How about the superconductor, super collider?"

And the guy said, "All right. What else do you want?"

Steve said, "How about a super train from Vegas to L.A.?"

The guy said, "All right. What else do you want?"

And Steve said, "Well, I'll have to get back to you on that." [Laughs] Now, that doesn't carry the same weight as the Secretary of Energy, and Chic Hecht described himself to me as President Reagan's man in the Senate.

CG: Yes, he was a Republican. That seems like a reasonable offer that NEA would have made. And whether they could have made it happen, who knows?

RM: The implications of the state's refusal are so huge. As you know, eventually they put the super collider in Texas, and then it got bumped off because of politics. They built the Large Hadron Collider in Switzerland and it does not have the power at maximum capacity that the superconductor super collider would have had. They're saying that it may never operate at full power because of some problems. So look at the loss to humanity, not to mention that Nevada would have been world class in physics.

CG: Absolutely, and think of the jobs involved in building it. At the time, Yucca Mountain was one of the biggest projects in the country, along with the super collider. The project manager and I would discuss our thoughts about fixing problems. Anyone connected to UNLV or UNR would have been fine with having the super collider. It would have been the right thing for Nevada.

RM: And the super train we still don't have one, and who knows when we ever will get it.

CG: That's true. Well, you talked about Secretary Herrington's offer to Senator Hecht. I can tell you about an offer that happened a little later. As we were going through the process I don't know the year, but Governor Miller was the governor at the time we might have been testifying in front of Congress, but I became acquainted with Senator Bennett Johnson from Louisiana. I think he was Appropriations Committee chair at the time. He wanted to get the project on track. At that time, the state's budget was about \$1 billion a year. He said, "How about if I assure you we can get the state \$100 million a year to do whatever they want to? How about if you go talk to the governor without any publicity, just you and he? Go talk to him and say we'll give him \$100 million. We'll still allow him to scientifically oversee what is going on to make sure it's safe and we'll keep the payment equal to taxes going on to Nye County. This would be a \$100 million benefit for the state budget with no strings attached.

I did make an appointment to see the governor and I asked to see him alone. He said, "I don't know if I'd talk to you alone, but let me have Scott Craigie come in here," his assistant at the time.

I said, "Well, as you know, I've got to have someone, too." Waiting downstairs in the governor's office was another gentleman, Ace Robison he worked with me at the time. I said, "Let me have Ace come up, just so we have witnesses to what's going on."

And I made that simple offer, \$100 million to the general fund. "Senator Johnson says he could deliver it. It's his commitment. I'm his emissary to pass that on to you."

He said, "I just can't take it. It's not good for the state. We are opposed to it under all circumstances." I reported that back to Senator Johnson, and that was the end of that

discussion.

RM: Did you report it in person?

CG: No, I phoned him immediately after I got out of the office.

RM: I wonder what he would have thought.

CG: I think he said, "I guess they're really opposed to it," or "I guess it's going to be a long, hard fight," or something like that. I met with him and his staff a couple of times during the process. One time we went down to San Diego; he was there on business and asked me to come down to talk to them to discuss what could make it work. My thoughts were, "We've got to do something about this 10,000-year issue. That's going to be hard to prove. And you have to eliminate the state from the entire process. Let us just go through federal agencies to get the permits we need to study it." I think that's when he came up with having the National Academy of Sciences look at it. But they went the other way - to 100,000 or a million years. But he knew it was going to be a long fight. The original law called for \$10 million a year in benefits for the state but he was willing to up that to \$100 million.

RM: I wonder what would have happened if he would have offered a billion. It would have saved money in the long run.

CG: Sure, it would have saved money. I mean, when Secretary Herrington was talking to Senator Hecht, that would have been a multi-billion dollar package, probably.

RM: Think where we'd be now. We'd be in a different league.

CG: That's true. But now we're here with a five-mile tunnel.

RM: And 13, 14 percent unemployment.

CG: That is true.

CHAPTER SIX

CG: Now to go into some of the public aspects of the project. We got the permits and we started studying and studying the site. During that process we thought it was important to keep the public informed as much as we could. If we couldn't get the politicians on our side, maybe we could get the public to understand what was happening and maybe they could pressure the politicians.

Initially, we set up a big information center on the edge of Meadows Mall next to the YMCA in Las Vegas and we planned "open houses" at the site. On a Saturday we'd take ten to 12 buses with 200, 300, 400 people out to the site. The tunnel wasn't built for some of that time but when the tunnel was half-completed, I think the public could walk into the first 100 yards of the tunnel. We'd set up stations or booths where the public could talk to our scientists. We allowed the state to set up a table and have their staff there. For safety reasons we rented buses, had tour guides, and even gave the people lunch.

I forget the numbers, but maybe 10,000 people took that tour. In the informal surveys we took, 92 percent or so were supportive of continuing to study Yucca Mountain after they went up and stood on top of Yucca Mountain and talked to us. But the state didn't like that. They saw we were maybe gaining some ground. They asked the Department of Energy to stop us from advertising our tours in the *Review-Journal* and on the radio.

RM: Oh, my God.

CG: They put on lots of pressure. We were also bringing school kids to our information center or to Yucca Mountain and they asked that the school kids not be bused

out there. They challenged us^o was that the right use of taxpayer^s money to bus kids? even though we^d pay for the buses through a grant to the school district. We even put up a sign at Cashman Field on the outfield wall that said, ^oTour Yucca Mountain^o or something like that, and they stopped us from doing that. The state said it was propaganda on our part.

This was in the late 80s and early 90s, when the Republicans were in charge. However, in 91 and 92, DOE headquarters took more of a conciliatory approach, thinking maybe if DOE cooperated with the state, things would be better. So they^d say, ^oOh, you don^t want us to advertise? Okay, we won^t.^o So my boss said to stop advertising.

RM: What did they specifically ask you to stop^o the bus tours?

CG: Advertising was one of the big things^o advertising the bus tours. Some DOE people maybe thought it was a waste of money, but I thought it was the right thing to do, so it became a debate. I think DOE headquarters was trying to show the state that they would cooperate; I don^t think they realized the state was not going to change their opposition. But they^{re} in Washington, 3,000 miles away, and when one or two senators come into a Secretary of Energy^s office and say, ^oYou know, we don^t like the way you^{re} doing things,^o I think they tried to be a little more collegial, using statesmanship. So we started to cut back a little bit.

I^{ve} given you some of our films. The lobbying arm of the American Nuclear Energy Council, ANEC, decided, ^oWow. The only way this is going to happen is to maybe turn around the public.^o So they put in some money^o about \$8 million. They hired some of the best PR firms in the state to develop the pitches^o I think there are 11 pitches in what I gave you that were to go on local TV to get the public used to the idea

of Yucca Mountain. They used some fairly good spokespeople. They used, actually, some of the governor's own PR people; people who got him elected. And they also used our scientists.

They were very good commercials and the ANEC were starting to run them. In one of them, as you'll read, the state made fun of the guy saying, "Nuclear waste is solid as pellets," or something like this. The campaign was starting to gain some momentum and we had a set of about ten of them to put out. I believe at the time somebody got to the DOE officials and said, "Don't put them out."

RM: So most of them were never seen?

CG: Some of the earlier ones were seen; most of them weren't. And the ones that were seen created an immediate stir because the state did not want people watching the 6:00 news and getting a commercial about Yucca Mountain. As I said, that was being done by ANEC, not by the Department of Energy, so federal funds were not involved. But they were told to stop it.

RM: Who would have ordered them to stop?

CG: The Secretary of Energy may not have the authority, but once again, I think the idea was, "If you want to be friends and you want nuclear power to go on, we're asking you to stop this little thing in Nevada. If you want new nuclear power plants and nuclear research to go on, if you want us to keep supporting nuclear, stop this little PR campaign in Nevada." Because compared to the big picture, it was small. Compared to Yucca Mountain, it was pretty big.

RM: And the impetus for that was from the state.

CG: Oh, sure. Without question it was coming from the state. And then, as things went on, we tried to go public as much as possible, using myself and scientists as

spokespeople. When a governor or a senator would say on TV, "The latest study says Yucca Mountain is bad," the TV people, to give them credit, always wanted an opposing view. So they'd call my staff and I'd go on or some other representative would; mostly it was me. I'd go on and we'd rebut the statement as correctly as we could. I'd bet I was on the TV news two or three times a week. That may be a little high, but it was certainly a lot. And maybe it was only 20 seconds or 30 seconds.

As you know, newscasters, if they get one side of the story, always like the other side because controversy creates a little more interest. One of the films I gave you was a panel that included Governor Miller. It seems we came across as credible because our view has always been, "If it's not safe, we don't want to build it. That's why we're studying the mountain. We haven't said it's safe yet. The law says to study it; we're studying it." So that's how we would respond. I believe, and was told, that I was very credible. And it seemed to be gaining some momentum. The state did not like seeing me on TV as often as I was.

Here's a little sidelight story. As I told you, I officiated football games. I remember doing a high school football game, I think it was Las Vegas High, and the quarterback got sacked and he said, "Gee, Ref, wasn't that roughing the passer?"

I said, "No, it wasn't that time. He just got you."

A couple of minutes later, he came over to me on the sideline. He said, "I just wanted to tell you, I saw you last night on TV and you were really giving the governor or senator or whoever it was, hell. But thanks for officiating the game, too." That was when kids were watching sports and they would watch the news before local sports went on the TV.

So we were getting a lot of exposure. We would go to any group that wanted us to

talk. Any Kiwanis Club, anythingô we'd send somebody to talk anytime, anywhere, any place in the state. Or even, for that matter, nationally if there was a National Academy of Sciences meeting.

One of the most critical comments Governor Miller made was one time when we had a conference here in Nevada and he called the DOE scientists "Keystone Kop scientists" or something like that. So the Assistant Secretary of Energy said, "Go after him. Do whatever you need to do."

I rebutted that by saying, "You know, that's just not true. That's not a fact. We're doing solid scientific studies. The governor was off base on this." I went as far as I could without calling him a liar.

You have one of the videotapes where I'm debating and the governor made an outlandish statementô something like, "10,000 years ago, Yucca Mountain was under water."

I said, "Governor, your own scientists don't say that. How can you say that in a public debate like this? It's just simply not true."

I heard after that he was told not to go on TV with me anymore. I don't know if that's true, but we never had any more debates like that face to face.

RM: If he believed that, it shows how ill-informed he was.

CG: It was just spinning rhetoric. Anyway, I thought we were gaining some credibility. Then along came the '02 elections and parties changed. The Democrats took the presidency in '02 so therefore they had a little more powerô the Secretary of Energy would have been appointed by a Democratic president. So in early '02, we were told, "Don't go on TV anymore. If they call you, just say "No comment," or whatever." They gave us a little leeway to respond, but in a slower, very toned-down way. And it was

Democrats at the time who were leading the charge. They didn't want to look bad, would be a nice word.

RM: I almost view that as a subversion of the democratic process. I mean, democracy has to have dialogue.

CG: I would think so, too. However, I had bosses and my bosses said, "Go study the mountain but just don't talk about it on TV." So we responded politely and it would either be "no comment" or something less direct. I know I had to sign a couple of things saying I wouldn't do this or that. Certainly we couldn't challenge any of their statements; we could just turn them around a little bit. I don't know the details, but it was an overt effort to keep us out of any face-to-face discussion with the state on our local TV.

And I was told that there was a high-level strategy meeting held, let's just say, between national and local Democrats. They thought that to be successful in opposing Yucca Mountain, perhaps there would have to be a new project manager for DOE. I think they thought we were having some success in affecting public perception. So at one point in time, I was asked to go to Hanford, and I did.

RM: What year was that?

CG: That was in '03. The scaling-down of the rhetoric had started in early '03 after the '02 election. And then I believe, there was a decision made that they wanted me out of there. And that was fine. I went to a nice job at Hanford. But I preferred to live in Vegas so I came back to Las Vegas and went to the Test Site and worked on environmental management programs. That was certainly not as controversial because we were cleaning up things. People liked environmental management.

RM: Were you cleaning up at Hanford, too?

CG: Hanford was a big clean-up project, yes.

RM: And that's a waste clean-up project?

CG: Yes, huge. It would have been a great job. I just had more ties here, whether it was sports officiating, a future wife - I wanted to stay close to her. We got married in '66 and raised sons here and enjoyed Las Vegas. I enjoyed my work at the Department of Energy in environmental management and also in some of the nuclear testing. I had several different jobs from '64 or '65 on. While Hanford would have been an exciting experience - they're still cleaning up Hanford and they're spending a lot of money - I just enjoy the Las Vegas area.

RM: Was Hanford, in your view, ever a serious challenger as a site for the nuclear waste repository?

CG: I was only the project manager at Yucca Mountain for about four months while Hanford and Texas were viable but from what I understood, it really wasn't. It was real warm underground; that would have made for hard working conditions and I don't believe the rock was as solid as our rock. And Texas, the salt, as I think we discussed before, was creeping a little bit. So I don't think either one was a serious challenge to our site. I think when they passed the Amendments Act in '87, they didn't understand the opposition Nevada would have because they had nuclear testing here and other things. I just think they didn't believe it.

RM: As the Yucca Mountain effort was unfolding, was there ever any thinking in terms of, "Okay. If we put the nuclear waste here, it's going to seed in a whole industry in the future." I think that if humanity can keep itself together, the spent fuel won't stay in the ground. It contains too much energy. I think it would eventually be used in reprocessing and transmutation. The Test Site could have become a huge production center for producing a large part of the energy for the entire West.

CG: Many people believe that. I believe it certainly wouldn't have hurt and it would have possibly helped. It certainly would have made Nevada the focal point for that kind of activity.

RM: Was there any thinking along that line while you were there?

CG: There was by those of us who supported Yucca Mountain, but not by anybody who opposed it. If Dr. Maxim or anybody else had advocated that position to the state, I think they would have looked at him askance and said, "Get out of here. We don't need this kind of thought right now." As I told you, it was a demagogue issue. "Vote for us, and we'll keep the waste out of your state. Keep voting for us and we'll keep getting elected and we'll keep it out." And eventually they have kept it out - including, of course, the last election, with President Obama's promise to not do anything here in Nevada.

RM: Yes. And basically it maintained our one-horse economy.

CG: It's true. I would have thought, had the repository gone forward, UNLV and UNR both would have had nice research budgets to look at things like the future of possibly transmutation, of reprocessing. The waste wouldn't have been buried forever because we had to be able to make it retrievable for 300 years, or make it retrievable in 1,000 years. I mean, that rock was not going to move. And if you had the spent fuel in canisters in a hole in the ground, you could just take it out if you wanted to. To me, it would have been a financial advantage for the state to have that, and certainly an educational advantage for the state.

RM: What is your take on the future of the waste storage? I mean, they've got to put it somewhere.

CG: I think it will stay at reactors like it is now, in casks, for at least the next 50 years

before someone will do anything. I don't think that's the right thing, but that's probably what will happen.

RM: Do you think that's really safe?

CG: It's probably safe. Safe becomes relative at certain points. We recently had an earthquake in Virginia and the casks there moved about four inches and that was only about nine miles from the epicenter. Nothing tipped over. As I told you before, we did some research and development of those casks in Idaho and we had the spent fuel in the casks. There's no doubt it's safe in a cask. Is it the right national policy to have, in essence, 100 repositories around the country, or is it better to put it in one place? That's the debate. That's why Congress chose Yucca Mountain. They thought it was better to put it in one place.

RM: Let's say that in 2012, the Republicans take over the country, which I think is a possibility. Would Yucca Mountain rise back as an issue?

CG: I believe not, as long as Senator Reid was still in control of the Senate.

RM: But the Democrats could easily lose control of the Senate the way things are going now.

CG: They could, but I don't see that being a priority for the Republicans with everything else that's going on in the country. There could be a scenario for it to be resurrected in four years, 12 years, 15. The tunnel is still there, the scientific data is still there. If there was enough national policy to steamroll Nevada politics, that would happen, but I just don't think there'd be enough national policy to do that. But the tunnel is still there. You could walk through it tomorrow and do it with a minor amount of safety inspection. So certainly, things could change. No one thought 30 years ago Yucca Mountain would be the place.

RM: As kind of a sociological question, why is it that the Republicans tend to be pro-nuclear, and the Democrats anti-nuclear?

CG: I don't know, and I think some of those things have changed slightly because what I would call a liberal Democratic organization, the National Resource Defense Council, NRDC, has come out as supporting nuclear power because it's a clean air thing, or at least they weren't adamantly opposed to it, like they've been in the past.

For the Republicans, I think the issue is free market. They're saying if it's more economical energy, why not go nuclear? I think many Democrats believe outside of a political issue that nuclear power is unsafe. I don't think they have a scientific basis for stating that.

RM: I see. Do you have more things you'd like to add?

CG: I've kind of summed up my approach to Yucca Mountain. As I've said, it's a great project. It was an interesting states'rights fight against national government and the states'rights happened to prevail because of, I believe, politics. I think Yucca Mountain would be a great place for the waste. I would be an advocate of always keeping it retrievable; never bury it. Let's put it underground, but always make it so you can go in and get it.

CHAPTER SEVEN

RM: How do you see the future of nuclear power?

CG: I am very surprised that Germany and Japan are going away from nuclear power with the shutdown of their plants.

RM: I wonder if they're going to regret it.

CG: I don't know. And I don't know where Sweden stands. They were going to shut them down, then they decided not to. I do give France credit for holding the line and saying, "We need power. This is our best source of power." A couple of weeks ago they had a little fire at a power plant, but it wasn't a nuclear fire. And in the United States, three or four existing sites want to add some units and I think that's moving forward. I believe there's one in Georgia and one in Tennessee. After what happened in Fukushima, Japan, that may be moving a little slower. Perhaps if we can add a few more units in the next decade, people will become a little more comfortable with it. It depends on the cost of power. It doesn't appear to me that green energy is economical yet. It may, of course, over time, but from what I read, it appears to be still pretty costly.

RM: And China, I think, is still going full bore with nuclear.

CG: Many of the developing nations are moving in that direction for clean air reasons and for economical use of resources because some of them do not have much fossil fuels.

RM: I've long thought that one of the best arguments for nuclear power is global warming.

CG: That's what NRDC has said.

RM: I don't see how Germany is going to get to a really low-carbon economy by taking out nuclear energy, which is 23 percent of their energy, and how are they going to

keep building solar and so on.

CG: The few times I've been to Germany, it may not be the best place for solar. I mean, it gets pretty cloudy there. And if you're not going to do it with solar and wind, then you've got to do it by burning gas or oil, and all those things create emissions that many people believe damage the environment.

RM: In the front page of the *New York Times* today is a big article on the new fossil fuel discoveries in South America. Brazil and Colombia are coming on as major producers.

CG: That does not help global warming purists.

RM: No. And my fear is that we don't have that much time on the global warming issue. In another 50 years, it's going to be pretty well decided.

CG: I have not studied it enough to know if it's just a cycle or if it truly is global warming, so I'm neutral on that subject. But I have friends now who work in North Dakota. Everybody gets a job in North Dakota right now. If you go up there, you can get a job. They're sleeping in cars.

RM: And Canada has the tar sands.

CG: And now there's debate about the oil line they want to run across the United States from the tar sands to the refineries in Texas.

RM: So they jawbone about green energy and low carbon, but they're going full bore on high carbon energy sources.

CG: Yes, because that delivers electricity cheaper than anything else. Bottom line, I think most people would like a lower electricity bill. Everybody can talk green and that's nice, but how much are they willing to pay for it?

RM: I think they would pay more if they knew their grandchildren or maybe their

great-grandchildren were going to have a better shot at a life.

CG: That's true.

RM: Is there anything else that we should talk about?

CG: I think the sad thing is the influence of politics on stifling public debate. It became all one-sided and anybody who was on the other side was viewed as an outcast to the local power brokers.

RM: If you were going to rewrite the Nuclear Waste Policy Act based on what we know now and your experience, what changes would you make that might give the project a better chance of succeeding?

CG: I'd do a couple of things. I'd certainly increase the benefits from a measly \$10 million to \$100 million or more, or to a significant percent of the state budget, say 10 percent. I would eliminate the state from the permitting process; I would make that a federal process. I would fund the state to oversee the scientific aspects. Because scientific debate is always good. I'd fund the state to continue the scientific work, but not continue the propaganda, as I call it, or the policy debate. Forget about the 49 against one issue. While I understand it's a policy issue, it's not part of the scientific issue for putting away the waste.

RM: How would you deal with the states' rights issue, which would come up again?

CG: States' rights would come up. I'm not a great historian, but we kind of supersede states' rights for lots of national interests, and I think this is one that should supersede states' rights for the national interest while providing some benefits to the state.

RM: How would you involve the local communities? Would they be involved? In Sweden, the states don't have a say but the local communities do, and the nuclear efforts are highly interfaced locally.

CG: Well, our government isn't set up that way so we have to appease the state. But certainly, we have to make the communities understand what's going on. I think the government didn't do a bad job of that as it provided some payments equal to taxes for the sited county, Nye County. It certainly provided oversight money for the adjoining counties.

RM: But it didn't give them a voice.

CG: It would give them an opportunity to express a voice if there was something they wanted to address, but they didn't get a veto. I think you can't give them a veto because that would make it unsuccessful - somebody could veto it on policy issues, not on scientific issues. That's the point I'm making: let's make this a scientific licensing aspect as opposed to a policy aspect.

RM: Looking back, what mistakes do you think the DOE made?

CG: I think one of the mistakes was to stifle the debate. I think they should have let ANEC spend their \$10 million a year on advertisements or whatever, or whoever wanted to spend money supporting it. I think they should have encouraged all our scientists to be available to the press at any time to talk about anything. While I understand their strategy was probably, "Well, if we cooperate, they'll cooperate," that didn't work for this particular issue in this particular state.

I guess I'll add one other sidelight in talking about benefits. I remember at the beginning when the payment equal to taxes issue came out, I was involved with Nye County; I was actually at the table negotiating. At that time, they allowed us to do that in the field with the county. What were the payments equal to taxes going to be? It was a big debate. Nye County said, "Well, there are going to be such-and-such expenses. We're going to tax the facility a huge amount."

The other line was, "Well, this is just wasteland out there. What would you tax if we didn't put this in there?" What is it really worth? something in the middle? We finally came to what I thought was an equitable negotiation of about 1 percent of the local DOE budget. They could do what they wanted with it, use it for schools, roads, much like the state was going to get something in the general fund. Maybe I'd increase that a little bit to the sited county.

I'd probably have explored what caused the sited county to lose some of its benefits with the creation of Bullfrog County. When the state created that county, then the counties around it and Nye County, in particular, said, "It's not in our county anymore, so how can we get some benefits?" That's how contiguous counties came about. Had there not been a Bullfrog County, I think only Nye County would have been involved because Yucca Mountain is in Nye County, and some of the contiguous counties only have a very few miles touching Nye County.

RM: And I think Inyo County, California, gets money, don't they?

CG: Yes, because they're touching Nye County. I went to talk to the Inyo County Board of Directors many times. That's just the way it was at the time. When the law was passed creating Bullfrog County, I think the only way they saw to include Nye County was to make it be all counties touching Bullfrog. And of course, Bullfrog was thrown out as a county by the courts after a while. I don't know if that was just a power grab by the state wanting to get all the benefits for the state capital in Carson City.

RM: Knowing what you know now, if you had been a consultant for the county, not for DOE, what would you have advised the counties to do that would have made their position better or enriched them more?

CG: I think they've done a pretty good job with what they have. In the beginning, if I

was representing Nye County, this may sound selfish for Nye County but I would have said, "Wait a second. We're the sited county. We're going to get affected significantly more than any others. The only reason you're involved is because of Bullfrog County. If transportation of nuclear waste comes through your county, certainly you'll be a good participant. But right now, Nye County should be the major stakeholder because this is where the repository is being sited. The other counties should be involved only if they are on a transportation route. And many of the counties were, too" Lincoln County would be a nice site for the railroad.

With the cards they were dealt, I think Nye County has done a pretty good job. They had to run a fine line because while they couldn't come out and support Yucca Mountain because of the state's opposition; they had to be neutral.

RM: I have one more scenario to bounce off of you. I was at the first meeting that DOE held in Vegas about Yucca Mountain, I think it was in March of '83. I followed it pretty closely for several years and I tried pretty hard to get DOE to let me do a scientific survey, which I was qualified to do, out in the counties to see what people really thought about the repository and try to tease out what the issues were. I could never get them to do that.

CG: I think that should have been done.

RM: My take on it is that early on, opinion in Nevada was very soft. I think opinion was soft in Vegas. The *Sun* was always opposed but the *Review-Journal* was soft.

CG: Barbara Vucanovich came out in support of it in a speech to the joint session of state legislature and she was criticized and ostracized. I talked to her after that and she said, "I can never do that again."

RM: Did you interface with her?

CG: Yes, I did.

RM: What's your recollection?

CG: I thought she was very fair and that she had great foresight for what was coming. At the time of her speech I thought, "I can't believe she's doing this," because of the state's position. I found out afterward she was highly criticized in most of the media for it and she had to back off.

RM: By not going out and scientifically assessing public opinion, DOE helped give the governor and the anti-repository people a free ride for years.

CG: They gave them plenty of momentum to oppose it. With all due respect to anybody who was on the project earlier, I think they truly believed science was going to prevail. But in anything, even science, you have to have public opinion on your side to succeed. There's a famous Abraham Lincoln quote about that. This was one of my credos as a project manager: "Public sentiment is everything. With public sentiment, nothing can fail. Without it, nothing can succeed. Consequently, he who molds public opinion goes deeper than he who enacts statutes or pronounces decisions."

That backs up what you said. Those who originally started the project were focused on science. They did a great job with the scientists but I think they maybe short-sighted what an important role public opinion was going to play.

RM: I have a document produced by Battelle, who was a contractor for DOE. This may have been before the Nuclear Waste Policy Act, or right in that era. They said, "The real challenge of developing a repository is not scientific. We know how to do that. Science can make it possible. The real challenge is political." And that's essentially what Lincoln is saying.

CG: Exactly, almost 200 years ago. We were talking earlier about some of the spent

fuel studies that went to Idaho. Originally those studies were supported by Governor Bryan here in Nevada. But when they were going to be expanded, he said, "Get the fuel out of the state." This wasn't the Yucca Mountain project, it happened two or three or four years earlier. The local DOE people, said, "Oh, it's no problem. It's research and development. Our politicians will be okay with it." They found out differently.

RM: What year was that?

CG: About '83 or '84.

RM: And before that, the state legislature had said, "Hey, bring it in."

CG: Yes, they had. That's before someone figured out there might be a nice political advantage to opposing it. For a while, they were never opposed.

RM: Is there anything else that we should talk about?

CG: You'd asked, in hindsight, what else might have been done differently to maybe facilitate the process. I talked about the benefits that could have been offered to the state. After Yucca Mountain was designated as the only project, I believe had DOE put a lot more decision-making in the Las Vegas office of the Yucca Mountain project office in Las Vegas, things might have gone differently. Originally they did have a lot of decision-making in Vegas, but as time went on through '87 to '93 and '94, they pulled a lot of that back to Washington. I believe it would have been more credible to leave a lot more of the decision-making here, close to where the project was. That may sound self-serving and parochial, but it's my genuine belief that that would have served Nevada better and might have added to the success of the project. I don't know if anything could have overcome the political juggernaut, but early on, many things could have been done slightly differently.

RM: The issue is bound to come back - I mean, they can't leave the nuclear waste at

the power plant sites forever. They can learn from the mistakes at Yucca Mountain. And as I've said, one mistake is giving the state all that power.

CG: I agree. But you've got to keep the public and the local communities informed and involved. Based on my limited knowledge of places in the country, right now I think there are a couple of places that would accept a repository. One of them would be the WIPP area in Carlsbad, New Mexico. And I believe Idaho would accept it. They have lots of reactors up there, they've got a lot of experience, and they have a lot of land. The geology may not be as good as it is here - it is above an aquifer. But from a public acceptance point of view, either of those two places may be accepting. But of course, they need to be scientifically studied.

RM: If you get outside Vegas and Reno, I don't think there's that opposition. I think in Nye County, there's strong acceptance for a nuclear repository.

CG: I agree. It's too bad that those opinion studies weren't done. Would they have had an affect? That's the other thing, because the power centers, where the votes are, are still going to lead the charge in opposition.

RM: Yes, it's definitely a conundrum. Well, thanks so much for talking with me and sharing your knowledge.

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