Oral History Center
The Bancroft Library

University of California
Berkeley, California

Global Mining and Materials Research Oral History Project

Tom Falkie:
Navigating Change as an Educator and an Executive in the U.S. Mining Industry

Interviews conducted by
Paul Burnett
in 2015

Copyright © 2015 by The Regents of the University of California

Since 1954 the Oral History Center of the Bancroft Library, formerly the Regional Oral History Office, has been interviewing leading participants in or well-placed witnesses to major events in the development of Northern California, the West, and the nation. Oral History is a method of collecting historical information through tape-recorded interviews between a narrator with firsthand knowledge of historically significant events and a well-informed interviewer, with the goal of preserving substantive additions to the historical record. The tape recording is transcribed, lightly edited for continuity and clarity, and reviewed by the interviewee. The corrected manuscript is bound with photographs and illustrative materials and placed in The Bancroft Library at the University of California, Berkeley, and in other research collections for scholarly use. Because it is primary material, oral history is not intended to present the final, verified, or complete narrative of events. It is a spoken account, offered by the interviewee in response to questioning, and as such it is reflective, partisan, deeply involved, and irreplaceable.

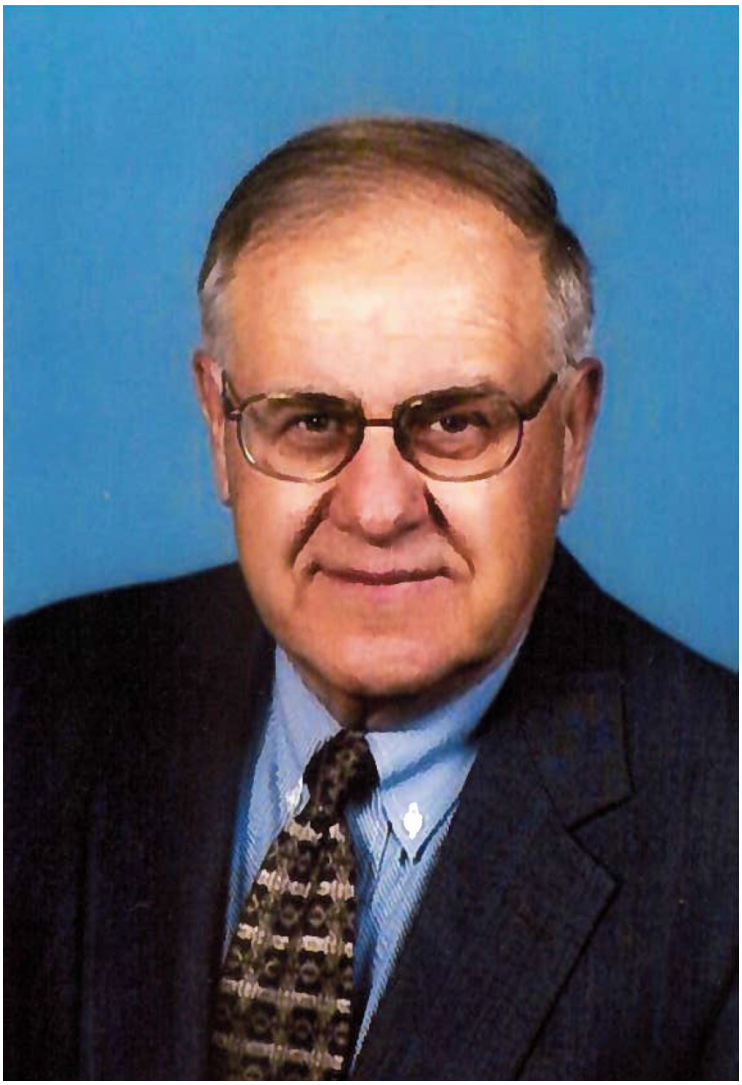
****

All uses of this manuscript are covered by a legal agreement between The Regents of the University of California and Tom Falkie, dated July 18, 2015. The manuscript is thereby made available for research purposes. All literary rights in the manuscript, including the right to publish, are reserved to The Bancroft Library of the University of California, Berkeley. Excerpts up to 1000 words from this interview may be quoted for publication without seeking permission as long as the use is non-commercial and properly cited.

Requests for permission to quote for publication should be addressed to The Bancroft Library, Head of Public Services, Mail Code 6000, University of California, Berkeley, 94720-6000, and should follow instructions available online at http://bancroft.berkeley.edu/ROHO/collections/cite.html

It is recommended that this oral history be cited as follows:

Tom Falkie, “Tom Falkie: Navigating Change as an Educator and an Executive in the U.S. Mining Industry” conducted by Paul Burnett in 2015, Oral History Center, The Bancroft Library, University of California, Berkeley, 2015.



Tom Falkie

Tom Falkie, a native of Mt Carmel, PA is retired President and CEO of Berwind Natural Resources Corp. He received his BS, MS and PhD degrees from Penn State. A pioneer in the use of computers and operations research in mine planning, he joined International Minerals and Chemical in various engineering and management positions in its headquarters and Florida phosphate operations. He then became Professor and Head of the Mineral Engineering and Mineral Engineering Management programs at Penn State. From 1974-1977 he was Head of the US Bureau of Mines. He then joined Berwind.

Falkie served on the Boards of Foote Minerals and Cyprus Amax, NMA, CEED, NCA and the Keystone Coal Association. He is a past chairman of the American Coal Foundation.

Falkie is a Past President and Distinguished Member of SME and Past President and Honorary Member of AIME. He was awarded the Erskine Ramsey and Charles F Rand awards. He is a member of NAE and a past member of its Governing Council and Industry Advisory Committees. He is Chairman of the Board of Governors of the National Mining Hall of Fame and Museum. He is a Distinguished alum of Penn State. He is author of over 200 publications, lectures, and speeches.

Table of Contents—Tom Falkie

Global Mining and Materials Research Project

For over twenty years, the Regional Oral History Office (ROHO) produced in-depth oral histories of members of the mining community, under a project called "Western Mining in the Twentieth Century," which was overseen by Eleanor and Langan Swent, Doug Fuerstenau and others. http://bancroft.berkeley.edu/ROHO/projects/mining/index.html The 104 interviews in the project covered the history of mining in the American Southwest, Mexico, South America, and Australia from the 1940s until the 1990s.

ROHO has recently changed its name to the Oral History Center of the Bancroft Library, and with that change we proudly announce a new project entitled “Global Mining and Materials Research,” which will focus on key transitions in technology, policy, and geopolitics that have brought mining to its current state worldwide.

Much has changed in mining industries in the years since the Western Mining project was in full production, including the increased globalization of mining operations, the decreasing concentration of mineable minerals in ore, increasingly complicated regulatory environments, new systems of environmental remediation, new technology for exploration, extraction, and processing, and new stories of political conflict and resolution. In addition to collecting interviews about mining engineering, metallurgy, and administration, we also hope to explore the history of information technology and data analysis with respect to mining, as well as the legal, regulatory, and policy history of the industries.

This interview was funded with support from the American Institute of Mining Engineers, Metallurgists, and Petroleum Engineers (AIME), the Society for Mining, Metallurgy, and Exploration (SME), the Association for Iron & Steel Technology (AIST), the Minerals, Metals, & Materials Society (TMS), and the Society of Petroleum Engineers (SPE). We are also collaborating with the IEEE to host these oral histories on the Engineering and Technology History Website, located here: http://ethw.org/Oral-History:List_of_all_Oral_Histories. Thanks also to former Western Mining Project Lead Eleanor Swent, Dr. Douglas Fuerstenau, and Noel Kirschenbaum for their advice and support while the Global Mining Project was being established. Finally, we are most grateful to Tom Falkie for taking time out of a busy schedule to speak to us about the evolution of the mining industry over the past forty years.

Paul Burnett, Berkeley, CA, 2015

Interview #1 February 16, 2015
[Audio File 1]

01-00:00:11
Burnett: This is Paul Burnett interviewing Tom Falkie, Dr. Tom Falkie for the Mining and Materials Research Project of the business series of the oral history program at University of California Berkeley and we're here at the Hyatt Regency Hotel in Denver, Colorado. And it's February 16, 2015 and welcome, Dr. Falkie.

01-00:00:41
Falkie: Thank you.

01-00:00:43
Burnett: We're glad you could spend some time with us. So let's start at the beginning. Can you tell me where you were born and where you grew up?

01-00:00:48
Falkie: Yes. I was born and raised in Mount Carmel, Pennsylvania, which is a mining town in the northeast Pennsylvania, anthracite coal area. My dad was a coal miner. My dad's family came from Italy and they were coal miners. My mom's family came from Lithuania and they were coal miners. Eventually my family got into operating pool rooms and bars and that kind of thing. So I grew up in Mount Carmel, part of the time next door to a pool room that was run by family and it was an interesting experience growing up with the types of people that loaf in pool rooms, that gamble and play pool and so forth.

My dad was active in the United Mineworkers of America and all through the growing up process was in and out of work because the anthracite industry was descending at the time. My mother absolutely preached to me about every other week, "You are not going to work in the mines. You are not going to work in the mines." Finally, when I got into high school, I was active in everything, like a lot of people are, football and all that, and I didn't know what I was going to do because we didn't have any money. My dad was out of work most of the time. And I saw a poster on a bulletin board of a scholarship from the Reading Anthracite Company to study mining engineering. So, I decided to apply for it. And it was not just apply. There was a whole process, interviewing people in the company and so forth and so on. And the last step of the process was to interview the president of the company. So, my dad drove me to this town and we were to meet with a man by the name of Ed Fox, who eventually was president of AIME, president of SME. Ed Fox just happened to be the superintendent of the mine that my dad worked in and my dad was the head of the union. My dad, driving me down, said—my dad, of course, had an eighth grade education. And he said to me, "You're not going to get this scholarship." I said, "Why not?" He said, "Ed Fox and I used to fight like cats and dogs because I was the head of the union and he was the management." Well, it turned out that Ed Fox, yes, they used to fight but he

had a little bit more respect for my dad than my dad thought he did and I got the scholarship.

So I went to Penn State. I had a choice of mining schools and I went to Penn State because that was the cheapest one. I worked for Reading Anthracite Company in the summers as I was studying for the bachelor's degree. I also had a couple of other jobs. After my freshman year I worked for my meals and I worked in the mining laboratory as a lab assistant. So we got to the bachelor's degree. I don't know whether to say this but I think I will anyway. Ed Fox was a big guy in the business and when I was a senior he called me in. He asked me to come in to his office and he said, "Look, I can give you a job if you want it." He said, "But I'm advising you not to go into the anthracite industry right now because it's tanking and you maybe have more potential than that." I've appreciated that ever since. I had several job offers at the time.

But at any rate, there was a man, Dave Mitchell, who was a professor and was dean of the College of Earth and Mineral Sciences at the time. He was a mineral processing guy. I was deciding which job to take and he called me in his office and he said, "Look, we can get a fellowship from US Steel if you want to study for a master's degree." We're talking 1956 now, right. I kind of got interested in computer applications.

01-00:05:50
Burnett: Really?

01-00:05:50
Falkie: At that time computer stuff was very basic. FORTRAN was just being developed and people were still writing programs with machine language and so forth. There were three companies that I was aware of in the mining industry that were interested in computer applications in mining and one of them was US Steel, one was Kennecott; one was International Minerals and Chemical Corporation. I'm sure there were others but those seemed to be the ones that were kind of leading the foray in mining.

So I stayed and I got my master's degree, and then, again, deciding whether or not to leave and go out to work, Dave Mitchell called me in and he said, "I want you to meet the people at International Minerals and Chemical Corporation," which is phosphate and potash. So, I did. I met them, and they invited me out to their operations and gave me a real quick tour of their operations in potash and phosphate. They gave me a fellowship to finish my graduate work.

01-00:07:21
Burnett: To do the PhD?

01-00:07:22
Falkie: Yes.

01-00:07:22
Burnett: Wow.

01-00:07:23
Falkie: To pursue the PhD. So I did. In the meantime I had gotten married, and we started having children. But at any rate, I established a good relationship with IMC, and when I was finishing my PhD they offered me a job. So I went to work for them at their headquarters, which were in Skokie, Illinois at the time. IMC is now called Mosaic.

01-00:08:01
Burnett: Can I ask, sorry to interrupt, in offering the fellowship did they have an expertise that they wished you to acquire? Did they shape your PhD?

01-00:08:11
Falkie: Yes. They were interested in this computer application operations research approach to mine planning and other types of planning. They were definitely interested in that. At any rate, I took a job with IMC [International Minerals and Chemical Corporation] in their headquarters in Skokie, Illinois for a short period of time and I was doing projects in potash mining in Saskatchewan and phosphate mining and even in fertilizer. I was analyzing such things as where do you locate a fertilizer plant, develop a linear program or a simulation type program—we were the first ones to get into potash mining up at Saskatchewan. Where do we locate the second shaft? Where is the optimum place for haulage and so forth, those types of problems. After, it wasn't even quite two years, they transferred me down to their phosphate operations in Florida and I became an operations research engineer there, doing the same types of things. What's the best way to mine and what's the best way to lay out the systems for hauling it and so forth and so on, those types. Location of one of the projects I worked on, for example, was we wanted to have our own port. Where do you locate it? Things like that.

01-00:09:51
Burnett: To illustrate this a little bit, operations research I mean, is it kind of the granddaddy of the analysis that goes into locating where Amazon.com will have its warehouses and have like—

01-00:10:06
Falkie: Yes. Exactly.

01-00:10:06
Burnett: —sophisticated programs—

01-00:10:07
Falkie: It's that kind of analysis. Yes.

01-00:10:08
Burnett: Right, right.

01-00:10:10
Falkie: Done mathematically and with computer programming, linear programming, and so forth and so on.

01-00:10:15
Burnett: Yes. How was it done before when you made decisions about where to locate plants? How would they do it in the past?

01-00:10:22
Falkie: Well, you didn't have computers before, for one thing. So you sat down and did it on pencil and paper with a calculating machine. And didn't have linear programming, didn't have simulation type stuff. You just did it the long way, the old way of trying different alternatives and working out the numbers and seeing how they compared with alternative A, versus B, versus C to locate this fertilizer plant or whatever it is you're working on.

01-00:10:55
Burnett: Right, right. And so they transfer you down to Florida, which has this giant phosphate rock.

01-00:11:01
Falkie: Phosphate. Big operation.

01-00:11:03
Burnett: Bone valley. Is that what it's called? This—

01-00:11:05
Falkie: No, it's not Bone Valley. It was a huge operation and there were other companies involved, too. US Steel had an operation. And I had a different job just about every year. I was there for about seven or eight years and I had a different job just about every year or so, including trying to look at a phosphate deposit in Morocco, planning how we're going to expand our mines, etc. And then I got into the production side of it. I got in charge of some of the engineering and the industrial engineering part of it. And then I got more into the production side. I was the production manager or production superintendent over a pretty large phosphate operation down there.

01-00:12:06
Burnett: The way you've told the story so far, it sounds like you got approached at various times for these fellowships or you learned about something and you applied. But this is complex mathematics, is it not? It's fairly sophisticated.

01-00:12:22
Falkie: Well, yes. It's even more complex now because back then we didn't have the tools that they have and the computers that they have now, the computer programs and so forth. As I said, when we first got involved in it, there wasn't even a FORTRAN at the time. And people were using machine language. And this is tough.

01-00:12:49
Burnett: Yes, it is. So you had an aptitude for mathematics?

01-00:12:55
Falkie: I had an aptitude for computers and a little bit for mathematics, yes.

01-00:13:00
Burnett: And coming from your family, did your mother encourage you to excel in math?

01-00:13:09
Falkie: Well, she had an eighth grade education and she encouraged me to study my butt off in everything. "You've got to do that homework and you've got to get it done. And if your grades are low you're not going to be playing football," and so forth and so on. So it was that kind of an Old-Country-type approach.

01-00:13:34
Burnett: Yes. Discipline and structure. Yes, yes. So you worked on different jobs. It was exciting because it was never the same thing twice it seems, right? So you moved to these different projects basically.

01-00:13:49
Falkie: That's correct.

01-00:13:50
Burnett: And at the same time you're learning more about the operations of the company overall, I imagine?

01-00:13:55
Falkie: Yes. Getting more and more interested in the production side and the general management side as time went on.

01-00:14:04
Burnett: Is that part of the process of management? That they're kind of cultivating you and others—

01-00:14:11
Falkie: They were cultivating me. There was no question they were cultivating me. Now, the problem is after seven or eight years down there they wanted to transfer me to a completely different company that didn't have anything to do with mining. They made a food flavor enhancer called Accent. You may have heard of it. You put this stuff on your food and it enhances the flavor.

And they had a big plant out in California. And they want me to go out there and run that. And I said, "No, I do not want to leave the mining game and I'm not interested." In the meantime, I got a call from my friends at Penn State, Bob Stefanko was head of the mining engineering program and mineral management programs up there. And he said, "Are you interested in getting into education?" And I said, "I don't know, Bob. That wasn't my original thought but what do you have in mind?" He said, "We need a department head

up here." And so I thought about it and talked to my wife about it and I said, "Okay." So I went up to Penn State.

01-00:15:49
Burnett: In State College [Pennsylvania] or—

01-00:15:50
Falkie: In State College, yes. And became head of the mining engineering and mineral management programs and the petroleum engineering was folded into that, too. It was just mineral engineering type stuff. Of course, all during this time I became very active in SME and AIME and that kind of stuff. Went to meetings. Was very active in all kinds of positions in the professional society game. But after about five years I get a call from—now, you have to realize I'm not active politically at the time. And I get a call from somebody in the White House saying, "Are you interested in becoming director of the US Bureau of Mines?" And that caught me by surprise. And I said, "Well, I have to think about that." Normally you jump on it but I had all these young kids. I had five children.

01-00:17:04
Burnett: Yes. And the oldest and the youngest at that time were—

01-00:17:16
Falkie: The oldest was about 15, and the youngest was about four.

01-00:17:28
Burnett: Yes, yes. Yes. High school.

01-00:17:29
Falkie: So I said, "Well, I have to think about this." So I talked to my wife. I said, "Yes." He said, "Well," he said, "this isn't a done deal but we're going to process it." And Senator [Hugh] Scott from Pennsylvania, whom I didn't know—I knew who he was, obviously—kind of became my sponsor. And went through all the process of interviewing everybody up and down and the White House. Now, you have to remember, Nixon is president at the time. And Nixon is having problems at the time.

01-00:18:05
Burnett: Yes.

01-00:18:06
Falkie: At that particular time. To this day I never met Nixon. I never saw Nixon. But anyway, we went through the whole process and the Senate hearings and all that and they approved me. President Nixon appointed me. Several months later he was gone and I served the entire Ford administration.

01-00:18:37
Burnett: Was the directorship of the US Bureau of Mines a kind of political position or a politicized position?

01-00:18:45
Falkie: Of course. There are always politics in Washington. You had to have a presidential appointment, so in a sense it was. They tried to politicize it a little bit later, after I left. Jimmy Carter and his administration tried to politicize it a little bit more but that didn't quite work. But in a sense it was political because you had to go through with this whole process of Senate hearings and going through the Congressional committees and all that.

01-00:19:20
Burnett: Yes, you had to be vetted. Yes.

01-00:19:21
Falkie: But everybody in back of me was not a politician. They were all professionals of some type related to the minerals. At any rate, I took the job. And this was right in the middle of the so-called energy crisis, when people were standing in line for gasoline.

01-00:19:45
Burnett: That's right.

01-00:19:46
Falkie: I remember that, big time. This was in March, and we had three kids in school and decided that I was going to commute between State College and Washington, D.C. for three months. We decided to buy a house, and then we'd move the family down because we didn't want to take them out of school with three months to go and start up at a different school. That was an interesting time because I had trouble getting gas, too. I found a little gas station up in the mountains of Pennsylvania that happened to be open on Sundays. Why it was I have no idea. But that's where I got my gas. It was out in the middle of nowhere. I used to take shortcuts to drive down. But that was a fun time, in a way.

01-00:20:29
Burnett: Yes. Was there ever any talk at that time about incentivizing the use of the Karrick process to develop petroleum from coal or something like that?

01-00:20:44
Falkie: Say that—

01-00:20:47
Burnett: About using a conversion process to convert coal into oil, synthetic oil?

01-00:20:53
Falkie: Oh, yes. There was work going on at the time. The bureau was doing work. The Bureau of Mines was doing work on that at the time. But obviously they speeded it up after that time.

01-00:21:05
Burnett: Right, right. The energy crisis. Yes.

01-00:21:17
Falkie: But, at any rate, I was head of the Bureau of Mines for, I guess it was close to four years. And when Jimmy Carter came in, obviously I left. I was not reappointed because I was a Republican and I was appointed by a Republican. So, I took a job. A recruiter came after me. Several recruiters with different jobs, job opportunities. And this private company, old-line private company called Berwind Corporation in Philadelphia, which owned a lot of coal reserves in West Virginia, Kentucky, Pennsylvania, Virginia, had coal mines, had a lot of other businesses, asked me to come and run their whole natural-resources thing, repairing railroad cars, a lot of different stuff. So I took that job and ran that for—I don't know how many years it was. I didn't add it up. But a bunch of years.

01-00:22:20
Burnett: Two thousand two I think is when you're done there.

01-00:22:23
Falkie: Yes. Two thousand two. And all through this time, again, I stayed active in SME and AIME nationally and became president of SME and president of AIME and so forth. That's kind of a thumbnail sketch of my career.

01-00:22:50
Burnett: Right, sure. Well, that's great. No, that is very efficiently done. But one of the things that comes to mind immediately, taking over at the Bureau of Mines from '74 to '77, there's the energy crisis. And the other big kind of political piece in the 1970s is, well, the environmental movement and the Pollution Control Act, the Clean Water Act. And so this is I guess '72. There are earlier laws being passed, as well. Can you talk about how that affected the work at the Bureau of Mines that you were doing, and also how the coal industry in particular adjusted or adapted to these new regulations that affected them?

01-00:23:43
Falkie: Yes. Well, in terms of the Bureau of Mines, the Bureau of Mines had been doing a lot of work that people weren't even aware of. I forget the terminology. They were doing work that related to fracking before fracking became fracking. In other words, a lot of people don't know that but the bureau had been doing work on putting chemicals in and drilling and so forth.

01-00:24:16
Burnett: Hydraulic fracturing of various kinds.

01-00:24:18
Falkie: Every time they passed one of these laws they would call for a certain amount of research to be done on different phases of the problem. But the Bureau doesn't get a lot of credit. They had been doing work on just about every phase, even mining. Before continuous mining became continuous mining, they were doing work related to that. On the coal cleaning side, they were doing work that relates to some of the stuff that's going on today. In addition, Congressmen were always flopping stuff in there on pet projects. Had

interesting stuff appear there, for example. I'll tell this. I don't know whether this will survive or not here. We were doing different types of coal preparation and we wanted to try a process, I don't remember exactly what the technology was to tell you the truth now. And we got in our budget proposal only like a million and a half dollars to build a little plant up in the anthracite area. And we were going to build it outside this congressman's district. And this congressman happened to be chairman of our committee, of the Interior Committee.

01-00:26:13
Burnett: Department of the Interior, yes.

01-00:26:15
Falkie: I got along very well with him. But he called me in one day and he says, "Doc, I want you to build that plant right here. And I'm putting it in the budget, that you're going to build it right here in my district." I said, "But why?" He says, "Well, for one thing," he says, and this is when the coal prices were extremely high—people were buying coal for their houses and so forth—were very high. He said, "That son-of-a-gun," and he named the guy, this one coal producer, he said, "is gouging my people," he says. "He's raising his prices and charging these prices and I want to screw him and I want this plant to get up. And any coal that's produced in this experimental plant, you can sell it and it'll compete with him." [laughter] So, it got in the budget that way. He put it in the budget that way. And you had some stuff like that go on. And it's even worse today, by the way.

01-00:27:19
Burnett: Yes. There's a lot of pork. Well, the Bureau of Mines is no longer, right?

01-00:27:28
Falkie: No.

01-00:27:28
Burnett: But there's a lot of pork earmarking and that kind of thing for—

01-00:27:35
Falkie: Oh, yes. All over the government. All over. In every phase of the government.

01-00:27:40
Burnett: Right, right. Well, yes. Tell me a little bit more about that time in the 1970s because you had an energy crisis and simultaneously you had tremendous political pressure and activism surrounding "cleaning up the backyard," so to speak. And there must have been adjustments that were made. And as you said, they were doing research. But they were doing research all the time, so not much changed, in your view?

01-00:28:17
Falkie: Not really. If somebody came up with a good idea, then you put it in the budget. The chances are we were getting a little bit bigger budget at the time,

and you would get the thing going. Now, remember, research is research, as you know. It's not you get out there, do the project, and build the building. You have to do the research and make sure what you're doing is going to work. And that takes a long time in most cases.

01-00:28:47
Burnett: Right, right. And I'm going to talk with some other experts about this. But by the mid-nineties the Bureau of Mines is shut down and a lot of other folks that I've talked to have really lamented this. It was a tremendous service to the industry to have this research being done by the government. It was a resource for everyone involved in the industry. And it's no longer. Can you talk a little bit about that?

01-00:29:18
Falkie: Yes, I can. Al Gore had a lot to do with that. He became a spokesman for the environmental movement and he got after the Bureau of Mines despite the fact that his family fortune was made from mining, collecting royalties on the lead mining in Tennessee. But there was constant pressure by the environmentalist movement on the Bureau of Mines because they were just beginning that "We got to get rid of coal, we got to get rid of mining." And who else in the government is there to pick on? But the first one to pick on would be the Bureau of Mines. So there was this movement to break up the Bureau of Mines or actually break it up in a way because a little part of it survived in the—well, let me just back up a minute.

When I got there in the seventies they broke up the Bureau of Mines and put the enforcement, the mine safety enforcement branch, toughened the mine safety laws, in a separate bureau called the Mine Safety and Health Administration, MSHA. The Bureau kept its research, which was primary research, and perhaps almost as important—let's say of great importance was the collection of data related to minerals all over the world. We had contact with the CIA and everybody else. What's Russia doing over here? Are they putting a tin mine in or are they putting some other kind of mine in over here?

01-00:31:13
Burnett: The government would consult with the Bureau of Mines to find out what—

01-00:31:15
Falkie: Absolutely.

01-00:31:15
Burnett: —was going on?

01-00:31:16
Falkie: Oh, the Bureau would consult with them, too, and find out what's going on from the CIA and others and the military. So that that data which was published, and I don't have any of that stuff with me here today, every year, in conjunction with the US Geological Survey, was used by everybody. The whole world used the data that was published by the Bureau of Mines. So that

was an important part, in addition to the research. But at any rate, the MSHA left and became the enforcement agency and we stayed as the research agency and the data information agency.

01-00:32:05
Burnett: When did that happen roughly?

01-00:32:10
Falkie: Well, right when I got there, they broke off, which would be 1974.

01-00:32:16
Burnett: Seventy-four. Yes. The services did not completely disappear, I understand. In the nineties USGS took over some of it and Department of Energy took over some.

01-00:32:29
Falkie: Yes. That was a complete breakup. Complete dissolution.

01-00:32:34
Burnett: Dissolution.

01-00:32:35
Falkie: Dissolving the Bureau of Mines. Of course, that was political, too. But the primary reason was the movement, at that time the environmental movement, people like Al Gore, had a lot of influence and they pushed it.

01-00:32:52
Burnett: Presumably they didn't argue that we just don't like mining. Maybe they did. I don't know.

01-00:33:00
Falkie: Well, some of the more radical ones did. Yes.

01-00:33:02
Burnett: Right. Sure, sure. Absolutely. But in order to make it happen you have to make some kind of rational claim for it to some degree. I'm guessing. But would they make some claim like there's nothing special about what's happening here and the Department of Energy can do that part and USGS can do that part?

01-00:33:21
Falkie: Yes, that would be part and the Geological Survey can do part of it and so forth.

01-00:33:25
Burnett: Right. So the argument was that it's kind of redundant.

01-00:33:30
Falkie: Yes. And the people on the Interior committees, it was controlled by I guess Democrats at the time and they went along with it. And unfortunately the

industry, in my view, and my friends are going to get mad at me for saying this, but the industry didn't fight for it enough in my opinion.

01-00:33:56
Burnett: They could have. Or perhaps they thought that it would be seen as trying to have some kind of undue influence and so they just decided to back off and not do it.

01-00:34:10
Falkie: Well, I don't know about the undue influence part of it. They just did not assemble their lobbying forces as they should have to back the issue of keeping the US Bureau of Mines. Maybe the powers-that-be in Washington for the industry felt that it was a lost cause, that they were going to lose it in the Congress anyway. But at any rate, I'm not saying that's the reason why; that's just part of the reason why.

01-00:34:50
Burnett: Part of the story. Right, right. And what do you think, in your opinion, were the consequences of this breakup?

01-00:34:59
Falkie: Well, the consequences of this breakup, if you look at it, there's just not enough research and development being done in mining, as there should be. And the bureau not only did the research but they funded a lot of the research into the mining schools and even into private companies, for that matter, to do certain types of research. So, for example, the mining schools really went through some rough times because they weren't getting funding from their primary source of funding for their research. And I would have to say that in my opinion you would be getting a lot more research done today if the Bureau still existed.

01-00:35:52
Burnett: It's an interesting piece. I know that there are schools of mines in the United States that have closed, right?

01-00:36:00
Falkie: Yes.

01-00:36:01
Burnett: It's a similar kind of dissolution that you're talking about. At UC Berkeley, for example, which had one of the premiere schools of mines at one time, they just decided to make it Engineering.

01-00:36:16
Falkie: Yes.

01-00:36:17
Burnett: Right. And I've looked and I've tried to find—there's one person who has had some expertise in mining and there's someone in Geology who has some expertise. That's two at the University of California Berkeley, total.

01-00:36:34
Falkie: Yes. Well, the Doug Fuerstenaus of the world were some of the top people in doing mineral separation, mineral processing research. I don't know what's happening at Berkeley today, I can't comment on that, but that's happening in a lot of different schools. Some dropped it. And some kind of folded it into curricula that are—I don't know how to describe this but with some mining involved but not the pure mining engineering. But you still have maybe fifteen accredited mining schools that are always struggling to get money for research. The students go up and down like this, the number of students studying it, right. You can't blame that on the Bureau of Mines situation totally because it happens when the industry health goes up and down, too. It's been an off and on struggle for some of these schools to just stay in existence, to stay healthy.

01-00:37:45
Burnett: Yes. To maintain the stability of the entire set of systems. Because I think what you're dealing with with mining companies, with any large firm, right, is the struggle to make their operations predictable, to make their markets predictable, to smooth things. That's what an organization wants and needs. And coal, and these other, you've got long swings in prices and price volatility that's quite significant.

01-00:38:17
Falkie: Yes. Well, just now, for example, the whole business. You've got oil is down. You've got copper prices are down. You've got coal mines shutting down for various reasons, even gold for that matter. But this has been traditional. The cyclical nature of the business has been traditional. If I had any guts I'd go out and buy mineral stocks right now because sooner or later it'll turn around.

01-00:38:49
Burnett: I was just reading in the mining journal that was given out here at SME and they were talking about how this mineral boom, prices boom from 2004, is in a decline but it's still higher than the long-run average. So it's kind of coming to the end of a boom but they anticipate that some of this is going to come back up again. But large organizations and large systems have always struggled with this question of volatility. Vertical integration is this classic thing you do to sort of manage the unpredictability of your inputs and outputs. And the state has had a role historically, I suppose. You've got the federal government underwriting in times of war, the Second World War, they underwrote mining operations and there were subsidies of some kind during the Cold War for critical materials and such. And the Bureau of Mines is an example of an institution, a state institution that undertakes research that might not otherwise be done. It's too expensive for any one particular company to do.

01-00:40:06
Falkie: That's correct.

01-00:40:08
Burnett: Okay. So how has the industry in the United States adapted, developed strategies to deal with price volatility? How do you manage it? What are some techniques? Getting into Berwind, for example. How do you manage this price volatility in the 1980s and 1990s?

01-00:40:41
Falkie: Well, it's not easy. If you have too much capacity you've got to end up slowing down your capacity, shutting down some of your mines. The coal industry now has got the overall problem plus they have the problem of they're getting hit on the utilization end because of the regulations on power plants. They're going to have a little bit of a problem making the comeback to where they were because they are closing power plants left and right throughout the country that burned coal. So what are the choices? If you've been supplying somebody with ten million tons a year and suddenly those power plants are shut down and they have maybe one left at three million tons, what's your choice? You have to cut back your capacity in some way.

01-00:41:45
Burnett: Yes. And we're talking about recent policy, as well, right? This is since 2007 but also—

01-00:41:52
Falkie: Right. Very recent.

01-00:41:52
Burnett: —in 2014 and this year, this effort to make plants more efficient, to get rid of the ones that are about forty years old and older and replace them with newer ones that are more efficient. And I think the goal is a 30 percent greater efficiency by 2030, something that's the policy goal. But that's a policy regulation, some kind that I don't fully understand. How is the federal government helping to incentivize that kind of transition?

01-00:42:39
Falkie: Well, we forgot to mention that back then the federal energy administration was formed about the same time as the bureau—

01-00:42:53
Burnett: Seventy-seven I think was DOE.

01-00:42:54
Falkie: No, it was a little bit later, wasn't it? Yes.

01-00:42:56
Burnett: Yes, '77.

01-00:42:56
Falkie: When was DOE formed? I can't even remember when.

01-00:42:59
Burnett: Nineteen seventy-seven I think.

01-00:42:59
Falkie: But I remember the DOE was formed and they started to do some research and they were fairly vigorous at times on it, in doing research for making clean coal or burning clean coal, converting coal, that kind of thing. And there's still some of that going on but it has been cut way, way back. You hardly hear anything about the DOE now because your coal-conversion-type plants that were planned are no longer on the docket or the budgets. So the DOE did not, in my opinion, fight hard enough for these things. Let's say, like the Bureau of Mines used to fight for similar things in the old days, you know what I mean? They were doing it, and some of the stuff they were doing was good but they were just kind of doing whatever it is that the Congress wanted instead of going up to the Congress and saying, "Boom, we got to do this. We got to try this coal-conversion process and having a lot of support." The Bureau of Mines had a lot of people back in the day; they had a lot of congressmen and senators up there who were strong supporters, who had mining operations in their districts, and very, very strong supporters. Even like Bob Byrd, for example, who was—and people like that, on the Democrat side plus the Republican side, the western people. They fought for this. DOE, and I haven't been following it in recent years as close as I should have, but they don't seem to fight as hard as the Bureau did for some of this coal-conversion stuff.

01-00:45:11
Burnett: So does that mean that the Bureau of Mines, perhaps because it was more connected to the industry, in a sense, right?

01-00:45:26
Falkie: Yes, definitely more connected.

01-00:45:28
Burnett: So, coal producing or mineral producing states had senators who had the backs of the Bureau of Mines and the industry and they understood common goals, let's say. And so perhaps the research at the Bureau of Mines was more translational, in that whatever they were doing was to provide some kind of service to the industry. So this is health and safety, we're going to do research on this, and then this research is going to be operationalized in every plant, in every mine in the country because they studied that.

01-00:46:09
Falkie: If it works.

01-00:46:09
Burnett: If it works they want to implement it. If it reduces costs, if it reduces injuries and deaths and improves health. But the DOE's mandate was not necessarily translational. In a sense, "do this research and then companies can adopt it if they want to." It's not necessarily—

01-00:46:29
Falkie: In a sense that's right, yes. Yes.

01-00:46:33
Burnett: So we've leapt ahead to policy being made like last month. [laughter] Let's go back a bit and talk about the transition from the Bureau of Mines to Berwind. You talked a little bit about how that happened. But this is a substantial corporation and it sounds like a holding company. Is that right?

01-00:47:05
Falkie: Very private. It's owned totally by the Berwind family. They started mining coal back in the 1880s and they've been private ever since they acquired large coal reserves, as I mentioned before, in the Pennsylvania, Kentucky, West Virginia, Virginia. They were always kind of quiet, ran their own mines, and didn't try to run anybody else's business. At some point in the game they started to acquire other types of businesses that didn't have anything to do with mining. I had some other offers, too, at the time. I had several recruiters call me, and I thought this would be interesting. We started to do some, I guess you'd call it wheeling and dealing, and I sold half of an operation in Pennsylvania. Remember, the coal industry when I got there was kind of even and it started to rise for a while. And Royal Dutch Shell wanted to get into the coal business of the US and I sold half of one of our operations in Pennsylvania to Royal Dutch Shell for a pretty darn good price. And the Berwind family did not want to expand rapidly in coal. So they started to put it into other areas. We did get into natural gas some. But, for example, they got into real estate big time and they had these other companies. We kind of took it from there. We're collecting fairly large royalties on different properties. We were running some mines in Kentucky and West Virginia a little bit and in Pennsylvania. And, again, with the up and down, had to fight through that all the time. We had some pretty good high-quality metallurgical coal in some of these operations, which always is nice to have. Prices are always higher and the demand did not go up as much and down as it did in the steam coal. So it was an interesting situation dealing with a family that ran the operation, that had hired guns running their various businesses and were not really that interested in expanding in the coal mining part of it. So we got involved in a lot of other things.

01-00:50:22
Burnett: Right. And were you supervising the other diverse industries? Or you were responsible for the natural resources piece of it?

01-00:50:30
Falkie: Some. Like we did railcar repair, for example. Repaired all of Dow Chemical Company's railcars and we had several plants throughout the country. It was a fairly large business repairing railroad cars for people. And we eventually sold that right before I retired. But the other businesses were run by other people, some of them. They were not very large most of them.

01-00:51:04
Burnett: Yes. Can you talk a little bit about shifting patterns of demand for coal products in the United States and how you adapted to that? Because

presumably big steel is winding down during your tenure at Berwind. So there's the mini-mills and they're using their scrap steels. They're not using the coal companies as much. How did you adjust to those kinds of changes during the—

01-00:51:33
Falkie: Well, one thing you did was you tried to export some more to coke plants overseas. And another thing is you had to make sure you had high-quality stuff, which we happened to have in the metallurgical part of it. And it was tough when the steel business started to go down the tubes. It definitely had an effect on the mining and throughout the whole of Appalachia. But we exported a lot of stuff and we did not expand as fast as we would like to have if the steel business had been going strong. And, in fact, we had to shut down some mines.

01-00:52:25
Burnett: Right. Who were the big customers worldwide for the coal industry in the United States and this—

01-00:52:32
Falkie: Yes. Well, we used to ship through what was—let's call them consortia. We used to ship to Germany and places like that, Luxembourg and places overseas that had different steel mills.

01-00:52:52
Burnett: And some developing countries, as well, that had steel operations? Or did they get their coal from other clients?

01-00:53:01
Falkie: No, they got some of their coal from the US. But the way it was done is we were not that large a producer, you know. We were not that large. So we used to sell through maybe a broker or a company that was putting together a package to sell, say, to France or somewhere. Well, I was over in France trying to sell coal over there and over in Finland and so forth and places like that.

01-00:53:30
Burnett: And you also alluded to changing demand for home heating and that kind of stuff, as well. Did that affect things?

01-00:53:37
Falkie: Oh, yes. Big time.

01-00:53:39
Burnett: So what was that transition like and how did that play out?

01-00:53:40
Falkie: Well, a lot of that happened even before we got there. Slowdown in use of coal in houses and when they started to convert to natural gas and oil and so forth. And that had a big effect on the coal business. I don't know what it is

now but there's not that much coal burned in houses these days, even up in the anthracite industry. We always burned coal in my mother and dad's house. We were coal. And I'm sure the people that bought that house eventually are not using coal. They're using oil. And I'd be willing to bet you have to really look hard to find a number of houses that are burning coal these days in the coal region. It's just not happening because, first of all, it's cheaper to use natural gas. Providing you have the supply source, the pipelines, and so forth, and oil.

01-00:54:46
Burnett: And that certainly does seem to be the policy emphasis today. There's obviously this great natural gas boom and there's this effort to switch to cleaner burning. Because something like, I don't know, is it 50 percent of the electricity in the United States comes from coal-fired plants? Is that right?

01-00:55:09
Falkie: Yes. And it's been going down. It's been going down each year.

01-00:55:14
Burnett: Roughly speaking, what was it when you started in the industry? Like in the sixties, let's say.

01-00:55:22
Falkie: I'm going to say sixty-five, seventy percent, maybe even a little higher. I don't remember the numbers but it was pretty high.

01-00:55:34
Burnett: Right. So there's a lot to adjust to, I suppose, for minerals industries but coal mining in particular. And so during your time at Berwind there's this effort to diversify. And that's not the areas that you were dealing with. You were dealing with coal mining and sales, land companies, railcar and railroad repair services, oil and gas, and environmental waste and disposal. Can you talk about that segment of it or was that not that significant?

01-00:56:14
Falkie: There was a lot of pressure on what do you do with these old coal banks that you had. So obviously we had to do something about some of them and had to put them in the proper condition where they were not exposed and not causing the pollution that they were. So there was a lot of work going on in terms of correcting these coal waste areas. Still is, for example, I think. So we, obviously, being in the business since the 1880s, had some things that had to be corrected and there was a lot of that going on.

01-00:56:58
Burnett: Are there some coal superfund sites?

01-00:57:01
Falkie: I think there are. Yes, there are.

01-00:57:04
Burnett: Yes. So there's a lot of environmental remediation going on.

01-00:57:07
Falkie: Not that many. If you do it right you can correct those problems. You can stop the water from going into the ground, so to speak, to say it in a simple way. You got to spend some money to do it but it can be done.

01-00:57:33
Burnett: And oil and gas becomes part of Berwind? It wasn't before? It was added in to the business?

01-00:57:39
Falkie: Well, there was increased interest in drilling for gas and oil on our property and we wanted to be involved so we took interest in some of the wells that were there. Now, I have to say, looking forward towards the end of my career there, this Marcellus Shale thing, which you've heard about, became the hot thing in Pennsylvania because the Marcellus Shale goes across the top of the state and down the western part of the state and it's been a real boon for Pennsylvania in terms of employment and so forth and the economy. And we actually had a company come in there, Atlas Resources. No, it wasn't Atlas. I can't think of the name of the company. Came in and wanted to drill a couple of wells on our property out in central Pennsylvania and we made a deal with them. Unfortunately it was right on the edge of Marcellus so it didn't work for us. But we did have other oil wells and gas wells on the property.

01-00:59:00
Burnett: Getting closer to the end of your time, you're also active in the industry, not just at this company but you've been on boards of directors of companies. And near the end of your time at Berwind you went back to Penn State to be part of this Global Business Advisory Committee from 2000 to 2002. Can you talk a little bit about that kind of work?

01-00:59:31
Falkie: Yes. Well, that didn't work the way I thought it was going to work. It was to advise the university on how to deal with what was going on in the global business environment. The university was going through deans and getting new deans and all that and they wanted some industrial advice. What's happening, what's going to happen in the businesses.

01-01:00:05
Burnett: And there were representatives from all the different industries that were part of this?

01-01:00:10
Falkie: Yes, like the oil and coal and so forth. Steel. Which was all in the College of Earth and Mineral Sciences. All these curricula were in the College of Earth and Mineral Sciences. And I was very active with a lot of stuff, the fundraising and everything else for the college. Yes.

01-01:00:33
Burnett: And it didn't work out the way you thought it would?

01-01:00:36
Falkie: No. Well, it just didn't have enough momentum, I guess.

01-01:00:42
Burnett: Right. It only lasted a couple of years.

01-01:00:45
Falkie: Yes.

01-01:00:46
Burnett: Yes, yes. And in 2001 you were part of a National Research Council Workshop on Energy?

01-01:00:54
Falkie: Yes. Well, I was a member of the National Academy of Engineering and the National Research Council is kind of related. So I got involved in a lot of stuff down there for a while, different committees. In fact, I was on the board of the National Academy of Engineering and that was just one of the projects that they had.

01-01:01:25
Burnett: And the National Science Foundation, you were on the board of mineral and energy resources, as well?

01-01:01:30
Falkie: Yes.

01-01:01:31
Burnett: Yes. So in other words, during the time that you were at Berwind you maintained an interest in the big picture academic—

01-01:01:46
Falkie: Absolutely.

01-01:01:47
Burnett: —and scientific and engineering challenges and research challenges that were facing those disciplines. And that was something you were very interested in. What were some of the challenges that you were interested in and that you saw when you were working at the NRC and for the NSF board? What was being discussed at the end of the nineties in terms of energy and mineral resources?

01-01:02:22
Falkie: Well, there was a lot of stuff. Of course, one of my motivations was to help keep the money going in the right direction from wherever it could come from in the federal government. But there was a lot of stuff going on on coal conversion, and on the metal side, there was a lot of interest in what are you going to do when copper grades go down? All these kinds of problems and the

federal government was constantly having these committees and so forth to write reports about, “We’re going to be in big trouble if we don’t do something about dwindling copper and so forth.” And I just felt like I had to keep active. And I got on the board of directors of a couple of companies. I just felt like I had to stay active because of my background with the Bureau and the fact that I had been active forever, really. SME and AIME and so forth.

01-01:03:42
Burnett: SME is interested in the overall health of the industry and in the health of the professional bodies, right?

01-01:03:53
Falkie: That’s right. The individuals.

01-01:03:53
Burnett: To keep abreast of the changes in technology and the changes in research. It’s an interface of research, researchers, and industry, as well?

01-01:04:12
Falkie: Right.

01-01:04:13
Burnett: And so can you talk a little bit about the evolution of SME and AIME? Because you were on the board of trustees for AIME from ’76 to ’79 and then ’84 to ’89.

01-01:04:25
Falkie: Well, even before that. I don’t know if you’re aware but the AIME was the original outfit. It was American Institute of Mining, Metallurgical, and Petroleum Engineers. And at one point it broke up into four societies, the metallurgical society, the petroleum, engineering, the—

01-01:04:51
Burnett: Iron and steel.

01-01:04:52
Falkie: —SME—and the iron and steel. And I was kind of involved at the time when this breakup was happening and involved in the governance of both of those, SME and AIME. I became president of AIME and it was slowly going to the point where AIME really became a kind of a—how can you describe it? It was just a top organization with—

01-01:05:24
Burnett: Like an umbrella organization.

01-01:05:26
Falkie: Or umbrella which didn’t really have a lot of—it had some money which all the other organizations were interested in but it didn’t really have a lot of active stuff going on. No more meetings. They still have a board and so forth but that whole evolutionary process occurred at that time, the time from when

AIME was AIME until you had the four societies and then there was very active AIME to a time when there is not a very active AIME. But the four societies are very active. And so there was a lot of discussion and arguing and so forth about how it should be done and eventually it became what it is today. I happened to be president of SME and was in 1984 and then President of AIME in 1988. And this was right in the middle of all this. So it was an interesting time. Took a lot of time.

01-01:06:33
Burnett: Yes. And, for the industries, was that a healthy transition? Was that a good idea to decentralize?

01-01:06:44
Falkie: Probably. I don't know I'd call it healthy but it was probably okay in the long run. Yes.

01-01:06:51
Burnett: Yes, yes. Because I keep thinking about the dissolution of the Bureau of Mines. Everything seems to be a bit more decentralized now and there's a lack of unity of voice, perhaps, from—

01-01:07:12
Falkie: There's a lack of unity of voice. No question about that in terms of politically and in terms of technology. For example, some of the stuff, although it's being kind of converting in different directions, that's in the metallurgical society, is stuff that people in SME are still interested in. The petroleum guys kind of do their own thing and the iron and steel guys do their own things. You could make an argument that the technology is different, and it is, but you could also, I think, make an argument that some of the stuff overlaps not only from a technical standpoint but from a policy standpoint.

01-01:08:06
Burnett: Sure.

01-01:08:08
Falkie: You mentioned the Marcellus Shale and issues like that.

01-01:08:12
Burnett: Yes. They're sharing common problems and common policy and political problems. And so there is that. Yes. Absolutely.

01-01:08:21
Falkie: I made a couple of notes. Not too many. I mentioned the cleaning plant situation. But we had a waste-to-oil pilot plant in Oregon. The Bureau of Mines had one back in the seventies and sixties and eighties. We were doing research on what we called micellar polymer flooding, which was kind of like fracking. You were flooding wells with this polymer to make it easier to drill and so forth. We were involved in helium at the Bureau of Mines, extracted helium and stored it. And, actually, that was kind of like a commercial operation. Getting back to micellar polymer stuff, they were using that for

what we called tertiary recovery, going in to old oil wells and pumping the stuff in and making more of the oil loose so that you could recover it, which is basically what's happening now in the Marcellus and some of these other areas.

01-01:09:55
Burnett: It's interesting. There do seem to be—

01-01:09:59
Falkie: Bureau was ahead of its time in many areas and that's one of them.

01-01:10:05
Burnett: Yes. Fracking didn't come out of nowhere.

01-01:10:10
Falkie: No.

01-01:10:12
Burnett: There are antecedent practices. I spoke with Roshan Bhappu about in situ leaching. And there were different kinds of procedures for injecting chemicals in and pumping out. And for him it was an environmentally friendly practice because you can mine uranium over farmers' fields using this technique and this technology.

01-01:10:44
Falkie: And the Bureau was doing some of that stuff, too.

01-01:10:48
Burnett: He really lamented the dissolution of the Bureau. He felt it was such a resource for researchers and for the industry and really lamented that that came to an end. So there was a lot of innovative work that was being done there. But also presumably the innovation doesn't stop just because the state is no longer involved. You've said that the government has been less supportive in funding different kinds of research into energy or resource extraction and resource processing. What about the claims of, say, the Obama Administration that there's this funding of alternative energy work? Has any of that money come into existing industries to make them more efficient? Has the mining industry been able to tap any of those resources?

01-01:12:04
Falkie: Not that I'm aware of. If so, it's on a very small basis. And basically what has been done in Washington by this administration is they're in effect subsidizing the solar and this type of stuff.

01-01:12:24
Burnett: Wind.

01-01:12:25
Falkie: The wind.

01-01:12:27
Burnett: Right. Renewable sources.

01-01:12:27
Falkie: And someday it may become competitive with other energy sources but it sure isn't today. The question is do you want to subsidize or don't you want to subsidize? And that's kind of a major policy decision that has to be made. They had this big conversion project plant down in, where was it, in Alabama converting coal to gas and it was a multi-billion dollar project. And the coal business was behind it. The states down there were behind it. I believe it was appropriated by the Congress. Then all of a sudden it was cancelled because the administration did not want to do anything related to coal. So it's political. I don't know what's going to happen from this point on but there are ways to burn coal efficiently or burn coal more cleanly. But it's going to take some work to find out exactly how to perfect the processes. The question is should the federal government spend the money like they were going to do down in Alabama, I guess, or not?

01-01:14:10
Burnett: Right, right. The sticking point for the administration seems to be that, I don't know, what is it, sixty-three percent of the coal plants in the United States are forty years old and older. It's a question of replacing plants with new plants.

01-01:14:37
Falkie: Yes. Either update them or replace them. Yes.

01-01:14:40
Burnett: Right. But doesn't that require some incentivization? Like some tax credit presumably or—

01-01:14:46
Falkie: Well, in my opinion that would be extremely wise and helpful but it's not happening to the extent that it should be. And as we mentioned before, they are shutting down a lot of these coal-fired power plants. And some of them will never start-up, even if the incentives come. Some of them could. And I don't know what's going to happen.

01-01:15:16
Burnett: So permitting for new plants is—

01-01:15:21
Falkie: Tough.

01-01:15:21
Burnett: —tough. You'd have to show that you're 30 percent more efficient than the existing plant. Well, I guess it's not so much a question for new coal mines because the coal mines exist.

01-01:15:35
Falkie: They exist. And you can get permits for new coal mines but you got to go through the rigors of doing it. The rigors and the time of doing it. You can get permits under certain circumstances.

01-01:15:52
Burnett: Right. One of the recent projects that got the green light, and this is not coal, this is copper, in Arizona, and I can't remember the name of it, but basically Senator McCain made this case that it was strategic. And so I wanted to ask you about that, as well. Because in addition to the environmental efficiency arguments and to the impetus incentives behind the policies, there's also a concern for energy independence and that's something that is a bit of a no-brainer for the coal, right? At current rates of production the United States has something like 300 years of coal production. Is that right?

01-01:16:46
Falkie: I'm sure, yes. Three hundred.

01-01:16:47
Burnett: At least.

01-01:16:49
Falkie: Well, look at what happened with this so-called fracking. We're now one of the largest oil producers in the world. Get back to the coal and the minerals in a minute. But with what we produce up in the Dakotas plus the Texas plus the Marcellus, and are actually in a position now where we can export. If we were allowed to we can export oil but we cannot export oil. I don't know if you're familiar with that or not.

01-01:17:25
Burnett: Sure. Talk about that a little bit.

01-01:17:27
Falkie: Some of the products you can do it but you cannot export oil. And then you have this oil pipeline from Canada and it's being fought [Keystone XL pipeline]. I haven't read the papers in the last few—I don't know what's happened. But that was passed in the Congress and what they were going to do is to bring that oil down and—process it down in Louisiana and so forth.

01-01:17:56
Falkie: And a lot of it would be exported. So people say, "Well, why are you doing that?" Well, some of it would stay here but they say, "Well, it's providing employment, building the pipeline, processing the pipeline. The processing plants down there are employing people," and capital and so forth. So you have this argument also that some of the people in the oil industry are saying is, "Let us export it. Let us make money and we'll keep these people in Texas and North Dakota and Pennsylvania and Ohio and all working." So that's kind of the general argument that's going on now. Now, so far as minerals are concerned, there's always been this question of strategic minerals. You got to know where it's coming from. And some of the minerals that we use are

totally imported. What was that situation that actually occurred maybe even before I got to the Bureau of Mines where there was a problem with tin? The tin prices went up 10 or 20 times because the Russians and some others were really controlling the production. So that would be what we might call a strategic mineral in a sense.

01-01:19:33
Burnett: Right. I know that in the case of the Vietnam War, the whole domino argument in Southeast Asia was that if they are able to cut off the Straits of Malacca then the United States would lose its access to tin. And so that was one of the claims, that minerals are extremely political in that sense.

01-01:19:59
Falkie: Yes. The so-called rare minerals, too, that we don't produce or don't have enough of and are needed in your electronic stuff and everything else that could cause problems if somebody really wanted to cause problems. They'd be dumb to do so because—but you never can tell what the hell the Russians are going to do anyway.

01-01:20:30
Burnett: Yes, I spoke with Alex King of the Critical Materials Institute in Ames, Iowa. And so they've got the green light for Mountain Pass. So Mountain Pass [Molycorp Mine] in California is opening and they'll be able to supply a tremendous amount of rare elements for the United States. But that's a case, again, where you can argue that the minerals industry can say that this is a special case that requires support, at least not interdiction from the government. And so there's a new copper mine that got approved that's going to provide something like 40 percent of the United States' needs in copper for the next forty years or so.

01-01:21:20
Falkie: Yes. Not too worried about copper because a lot of it's coming from South America. I guess it depends on—

01-01:21:25
Burnett: It depends on the commodity.

01-01:21:26
Falkie: That could change, too, yes.

01-01:21:27
Burnett: Right. Exactly.

01-01:21:29
Falkie: Peru and Columbia and those places went bonkers for a while with the Shining Path and so forth. I remember one little story here. I was on the board of directors of Cyprus Minerals, which was a large company, and we built a new mine down in Peru not too far from Machu Picchu. They flew us in on private planes and told us, "Don't go to Lima. Do not go to Lima." I was thinking about taking a trip up. But they flew us in on a private plane to—

what's the town at Machu Picchu, the city near Machu Picchu? God, it's not coming to me. [ed note: Cusco]

01-01:22:12
Burnett: Me neither.

01-01:22:16
Falkie: We had the big dedication and did a little bit of the touring. But three of the ladies, including the chairman's wife, were down in the town where we were doing shopping and they were surrounded by a group of ladies that tried to push them into the back room to rob them. But fortunately we had guards with them and they scared these other ladies off. But that's what was going on down in Peru at the time, plus the so-called Shining Path. We weren't supposed to go into Lima because they were afraid somebody would come after us. So you have some of that going on. But the fact of the matter is that Peru has kind of straightened out a little bit. And I've been in Chile several times. That's your big copper producing country. So I'm not overly concerned about copper but there's a lot of these other rare minerals that we've got to watch out for.

01-01:23:25
Burnett: Right, right. And so the industry has made cases for—there needs to be some permitting to make sure that the United States has some kind of independence in terms of supply chains. And I think that's what they're in charge of now at the Ames Lab. They're in charge of watching that.

01-01:23:47
Falkie: Yes. And that's what the Bureau used to do, watch on a very—

01-01:23:52
Burnett: Oh, is that so? Is that so?

01-01:23:55
Falkie: I used to have contact with the CIA and everybody else when I was down there about these kinds of things. "Well, the Russians are doing this or the Chinese are doing that." But there's also a matter of economics. You can't just say we want to produce XYZ mineral if it's not economical, too. But at least you know it's there and you could produce it if you had to.

01-01:24:19
Burnett: Right, right. Or at least in the case of—I wish I could remember this now. But it's the new mine in northern Arizona. It had been turned down ten times, its application, and it's when it became part of the defense nat—I'm going to get the name wrong. But it's a National Resources Defense act— [Ed. note: National Defense Resources Preparedness Executive Order 13603, signed by President Obama in March, 2012]

01-01:24:19
Falkie: Council, yes.

01-01:24:50
Burnett: —basically. And so it became a rider on another bill and it allowed the permit to go through, whereas otherwise it hadn't. And so it seems to be at least one way in which a particular industry can lay claim to saying, "We are providing necessary materials for the 'defense of the realm,'" so to speak.

01-01:25:15
Falkie: Yes. And there are people in the government who recognize that you—well, the old Bureau of Mines guys are disappearing but some in the Geological Survey and so forth. There are people who realize what's going on but there are also people who oppose any type of mineral permitting in areas that they think are wild areas and so forth.

01-01:25:44
Burnett: Right, right, that are sensitive. So, coming into the current period, you've been out of Berwind since 2002. And since then, can you talk about how you've been active in the associations and in the industries?

01-01:26:08
Falkie: Yes. Well, I stayed active actually for a couple of years in the National Mining Association as a director emeritus. Then I backed out of that. I was on the board of directors of Foote Mineral Company, which is the lithium company that was eventually acquired by Cyprus. And so I became a member of the board of directors on Cyprus and went through all of that activity, where Cyprus eventually was acquired by Freeport McMoRan.

01-01:26:46
Burnett: Amax? Was it Amax that—

01-01:26:50
Falkie: They had acquired Amax.

01-01:26:52
Burnett: Okay. Oh, Cyprus acquired Amax.

01-01:26:53
Falkie: Yes. Cyprus Amax was the name of the company.

01-01:26:56
Burnett: Okay, okay. It was the other way.

01-01:26:58
Falkie: And then it was Freeport McMoRan that eventually ended up owning Cyprus. And I went off that board. And I stayed very active in SME and AIME activities and I did a very little bit of consulting for a few companies and then I started to slow down and started to play golf. But I stayed active in AIME. And my wife passed away, well, maybe twelve, thirteen years ago. Kind of changed the flavor of things.

01-01:27:38
Burnett: Right, right. Sorry to hear.

01-01:27:38
Falkie: And so here I am, eighty years old, and basically, except for this stuff, I've decided that it's time to play golf and ski.

01-01:27:53
Burnett: I did want to ask about the changes in mining industry overall. This is something I'm asking most everyone I talk to. At the time that you were entering the mining industry, the top ten mining companies worldwide, about half of them or more were American or based in the United States. And now I think there's one in the top ten and the rest are Canadian, Australian, and Chinese. And I think four are Chinese now. And so can you talk about that shift? Is that significant given that these are global operations? There's Americans working in BHP Billiton and all of these other firms.

01-01:28:48
Falkie: Well, this was a frantic period where there were so many acquisitions going on. Even internally within the country there were acquisitions going on. Well, like Freeport McMoRan acquiring Cyprus and stuff like that was going on at a rapid, rapid pace. And these other countries were a little bit more, these other, let's say, foreign companies were a lot more aggressive. Your BHP-Billitons and so forth. And they decided that's where they want to put their money, into the minerals, and they had their own going on. And our companies, I don't know how to say this, or I don't know why, but they just weren't as vigorous in growing as were some of these other companies that were controlled overseas. The Chinese, I do know how to explain it, they obviously have a lot of mineral resources on their own and they've got a lot of money. And you do things very quietly and their economy is growing a lot faster than ours was. It still is. And a lot faster than others. And they started to not only build their own mineral operations in their own country but they decided, "Well, we're going to start to invest overseas." We have a different type of economy than China, obviously. We've got to deal with the stock market and the shareholders and all that kind of thing. So they just weren't as vigorous. Now, you mentioned Freeport McMoRan. They do have foreign operations and they do have big ones, and some of those companies. But some of the other ones have disappeared. US Steel and Mining, for example. They don't have any coal mines anymore. They sold all their coal mines off. They hardly have any iron operations anymore. They get their iron from other people. You could probably name some others in the metal mining industry that just haven't been—they used to run the mine up in Montana has disappeared. They've just kind of—

01-01:31:22
Burnett: Anaconda, yes.

01-01:31:24
Falkie: Anaconda no longer exists. I don't know why. It's just a matter of the overall economics. Maybe the value of the dollar had something to do with it. There's various reasons, I guess, why this has happened. We, I guess, maybe weren't

as vigorous as we should have been with some of our companies. And we were also having trouble getting permits and deposits to mine. You mentioned some of the ones in Arizona that you talked about before. Getting permits to mine on some of the better deposits here that took years and years and years and dollars just to get it started. It's just kind of a natural evolution that's a function of the overall world economics, function of the value of the dollar and function of the politics of the situation.

01-01:32:22
Burnett: I'm sure there's no simple answer. Some of the things I mull over in my head, in the case of Anaconda, they got burned badly in Chile and so there's perhaps a kind of—when other companies were going global aggressively the United States had experienced getting burned in other countries and had lost money and perhaps there was some kind of retrenchment. And then in the case of steel you have the decline of some of these vertically integrated enterprises. They're spinning off the coal divisions as unprofitable or as the end of the system. And mini-mills come in and—

01-01:33:06
Falkie: Yes, mini-mills.

01-01:33:06
Burnett: —are really lean and their feedstock is scrap metal. So in a sense the United States as a whole kind of spun off its mineral operations, for better or worse. That seems to be a kind of overly simple but an overview story of what took place. Oh, sorry, go ahead.

01-01:33:32
Falkie: Well, I was just going to mention Chile, for example. You mentioned Anaconda and all and I had been down there doing some consulting for the United Nations, believe it or not. I was there when Chuquicamata was kind of booming. And then I was there a short time before Allende took over, doing consulting for the United Nations. Right? Just a few days actually.

01-01:34:09
Burnett: Oh, really?

01-01:34:09
Falkie: And I left and then I went back and it just happened to be a few days before Allende was deposed. But that's not the point I'm trying to raise. When I was there at the mine and I wrote some reports on how maybe you could do some things a little bit more efficiently, I don't know whatever happened to them, put these reports in the UN. But when I came back, right before Allende was deposed, man, they had doctors and lawyers and everything else driving trucks up at that mine and running the shovels and it was a freaking mess. And I wrote this in my report, how this mine was being totally operated improperly. And, again, I don't know what happened. But then Allende was deposed it took them a long time to get back to where they are now. But the Chileans are pretty good themselves and they used to send students up to us, graduate

students and so forth. But boy, the political system can really screw things up in a hurry.

01-01:35:25
Burnett: Yes. It's hard to get to the bottom of that story. We have oral histories, Bob Haldeman's oral history on what happened in the case of Braden Copper. But if you talk to Bob Haldeman and like folk they said the administration took over. You had kids basically with a couple of years of engineering—

01-01:35:52
Falkie: That's what I'm saying.

01-01:35:53
Burnett: Or sometimes they weren't engineers at all and they were operating things. And then because they were sort of supporters of the workers, the workers would sabotage stuff so that they could have a party and things like that. And then on the other side, I actually got critical feedback from a former engineer, a Chilean who was a communist at that time. And he said it's actually the other way around, is that the companies were trying to show that we were ineffective so they were deliberately sabotaging the operations. But there are many stories about how that unfolded.

01-01:36:34
Falkie: Yes. I had four graduate students up there. One of them became what you would call a commie, I guess, and one of them was kind of halfway and he went down there and then bailed out, went over to Europe. And the other two were just standard production engineers. But I'll just quickly tell you a little story.

01-01:36:56
Burnett: Sure, sure.

01-01:36:57
Falkie: When I was getting ready to go down there this kind of last time, went right before Allende was deposed, my mom says, "Sister so-and-so used to live down the street and she's teaching down in Santiago at such and such a church. You got to go visit her." "Okay, Mom. I'll do that." I go down there, I go out, I'm going to grab a cab, go out there. I call the sister and she says, "Okay." And I happen to get the last cab. They were out of gas and everything. Their economy was almost destroyed. They didn't have any gasoline. But I found a cab and he charged me the value of the—what's their coin? I forget. But the value was going down, down. And I said, "I don't care what it costs." I didn't tell him that. But I go out there and the sister comes out. I didn't know her. And she grabs this cab driver and says, "You stay here. You stay here." Because she knew I'd have a problem getting back. Well, he didn't stay there so I visited with them for a while, with the nuns. And I could see them scrambling in the background trying to figure out how to get me back. Somehow or other they took their van at the school that they were teaching and they were able to get a half-a-tank of gas somewhere. Drove me back. But

that's what was going on at—But that's what was going on down there at that time.

01-01:38:50
Burnett: That's perfect.

01-01:38:51
Falkie: But anyway, we've gotten off track here with stories.

01-01:38:54
Burnett: Not at all. Not at all. Perhaps we could just—with your reflections, your years of experience. You've been a professor of engineering, head of a department at Penn State, Director of the Bureau of Mines during a critical period in the history of that institution and in US history, and then several decades as Chairman and CEO of Berwind Natural Resources. So you have this wealth of experience in a number of different industries. What do you think is the trajectory of resource extraction and processing in the United States and what could facilitate a smarter use of state resources and industrial resources? What kind of policies would you like to see implemented going forward?

01-01:40:00
Falkie: Well, it is obviously partially political, right, because if you get an administration in that's going to be shutting down coal plants or taking ten, twelve years to get a permit on a mine operation somewhere, it's going to hurt in the long run. It's hurting now. So I would say that the overall governmental policy on minerals has got to improve. I don't know whether we'll ever get to the point where we were the world's star because you have China that probably is half unexplored now and you've got Russia. But they have their own problems with the political systems they have. I think that the technology, despite the fact that there is no Bureau of Mines to help boost it, has definitely been improving. When you go out on this floor for this convention that we're at you will see some of the things that companies are coming up with. It would be nice if the government would support more research. But I'm not sure that's going to happen, even if administration's change. And a real pro-mining administration gets in there, you'll get a little bit more research. But I don't think you're going to get back to the Bureau of Mines stage, where the Bureau of Mines was kind of pushing things. I don't think that's going to happen for quite some time. But you have to have a positive attitude in Washington and the people who are running the government, both in the Congress and the administration, have got to realize how important this mineral system is to our country, not only from an economic standpoint but from a military and overall strategic standpoint. You've got wild people in the world these days that are doing crazy things and some of those crazy things are happening in areas where you have energy and mineral resources and you have no control over that. So you've got to keep control over what's going on on here. Not in the very near future, I doubt that you're going to have a clear mineral policy, but I think you're going to have to have a shift on the part of Washington, and in some cases, some of the states. But some of the states are

glad to have plants and operations, moving plants down to Alabama and so forth from states that, for various reasons, aren't as—

01-01:43:08
Burnett: Pro-mineral, I guess.

01-01:43:09
Falkie: Yes, yes. So I think that a little bit more pro-mineral attitude on the part of the Congress and the administration is extremely important for us. And I don't know what's going to happen in the Mideast and I don't know what's going to happen with crazies like Putin over there that want to control the world.

01-01:43:34
Burnett: Right, right. Was it better during the Bush Administration or Bush two, I mean? The Bureau of Mines did not come back, for example.

01-01:43:45
Falkie: No.

01-01:43:47
Burnett: But was there a shift in policy towards maybe permitting or research?

01-01:43:52
Falkie: Well, I think there was a definite help at the time. Of course, they were all wrapped up in Iraq at the time, too. It is usually always better under a Republican administration, although there have been some good democratic mineral types, like Lyndon Johnson and so forth, that were pretty pro-mineral. Now, what's going to happen next I don't know. I don't know who's going to be the president.

01-01:44:21
Burnett: Right, right. Well, this is oral history so we will refrain from the crystal ball strategy. But it's been good to have your perspective on where you've been and where things might go next. Dr. Falkie, I want to thank you very much for your time. We really appreciate your taking the time to speak with us.

01-01:44:37
Falkie: Well, it's been a pleasure. It's been a pleasure recalling some of this stuff and I appreciate it.

01-01:44:42
Burnett: Wonderful.

01-01:44:44
Falkie: Okay, thank you.

[End of Interview]