

**LARRY HOFFMAN**

**The Verdigris Project**

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**Oral History Transcript of Larry Hoffman**

*Interviewer: Clark Grant*

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[00:01:47]

**CLARK** **GRANT:**So I'm going to start the recording here and I'm here today with Larry Hoffman. Would you mind just saying and spelling your name for a sound check?

**LARRY** **HOFFMAN:**Larry Hoffman, L A R R Y. H O F F M A N.

**GRANT**: Great. Normally what we do with folks is, this is what we call a life history. And so we try and start with people's grandparents. Have you recollect as far back as you can, and then come to modern day. In the interest of talking to you specifically about mining, I might today start with just your childhood. And then in a subsequent meeting when we meet up, if we could go back I'd like that. But, so were you born in Butte?

**HOFFMAN:** No. I was born in Lewistown, Montana, and raised there for most of my life in that central Montana area. And when I was about four or five, I got hay fever really bad. And just before my eighth birthday, we visited friends who had an underground gold mine, and I found out there wasn't any pollen underground. So, I spent every available moment that I possibly could underground from then on.

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**GRANT**: Just because of that, or was there more to it?

**HOFFMAN**: Oh, for a kid, I mean, you got little mine cars rolling around on railroad tracks and people are blowing things up with dynamite. And there's a lot of dark places to explore. And you know, I didn't really realize it as much at the time as I could have, but the real attraction was the people.

All of these small miners and prospectors were real independent. Characters is the only way to describe them. And they were just wonderful people to be around.

[00:03:39]

**GRANT**: Could you maybe highlight one, one in particular? One of these characters?

**HOFFMAN:** Yeah, excuse me. There was a guy named Joe Nordquist who wasn't really a miner. He was more of a rock collector. But his big interest was Yogo sapphires and the Yoga sapphire mine was only about 50 miles from Lewistown.  And he drove an old Model A Ford, where the rumble seat had been taken out and replaced with a box. So it was kind of a small pickup truck. And he'd take me from the time I was probably 10 years old maybe. And we'd make trips out to the closed sapphire mine. Which was of course no trespassing and everything else.

And there were piles of the sapphire ore that had been left out to weather, because the rock had to weather before you could take the sapphires out. And we'd load up buckets of this dirt and take it back to Lewistown, wash it and found some decent sapphires.

[00:04:45]

**GRANT**: Now, is there money in that or are you just like the finding things?

**HOFFMAN**: Oh yeah. Well, he would cut them and sell them. And I never saw any of that money because I'm just out there getting an education, but he was a great guy. He had one eye that was just nothing but a white eyeball with blood vessels through it. So he had this really strange stare and this huge shock of white hair. Big, tall guy. He must've been 6'3 or 6'4 and just had a great way of talking. I mean, really a character.

**GRANT**: When would he have passed away then?

**HOFFMAN**: Oh, he must've passed away and probably the mid-eighties.

**GRANT**: Yeah. So as far as your education as a kid, was it mostly in mines or did you go to school too?

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**HOFFMAN**: Yeah, I actually went to school like normal kids did and graduated from Fergus High School. But I was kind of in an awkward position because working with these old timers in the mining business, all of them were born in the 1800s. And they knew, I mean, they literally lived from candle illumination to electric cap lamps. From hand drilling to jackleg rock drills. I mean the whole gamut of things there, but, you know the stories that were fascinating were how things were when they were young. And you know, mining was a tough business.

**GRANT:** Much tougher then.

**HOFFMAN**: Then, oh yeah. I mean, all of it was handwork and especially for the small mines in central Montana, which in some respects never modernized as much as a place like say Butte. It was always on the cutting edge of technology.

**GRANT:** Even today, maybe that's true about Butte, would you say?

[00:06:39]

**HOFFMAN**: Not so much now. I mean we're limited to open pit mining and yeah, they've got bigger trucks and bigger shovels and their processes in the recovery system are improved. And we've got great management here. We're one of the lowest cost copper producers and moly producers in the world, which is pretty remarkable when you consider the climate and the relative remoteness here.

**GRANT**: For sure. I just have a quick sidebar. I remember Dennis Washington famously said he's not anti-union, he's a union-free.

**HOFFMAN**: Yes.

**GRANT**: What did you think of that at the time?

**HOFFMAN**: You know, when I came to Butte from the small mines of Lewistown, it was a real shock to me to see the extent and depth of unionism here. Over the years, the company had worked out a relationship with the union. But in a lot of ways it crippled him. When I was here, the Berkeley Pit, for instance, if a shovel went down, I think there had to be something like 14 unions represented there before repair work could even start on the shovel.

[00:07:54]

**GRANT**: Like boiler makers, machinists...

**HOFFMAN**: Electricians, iron workers, steel workers, operating engineers. I mean, it just went on and on. And sometimes the machine would be disabled for days for no other reason than you couldn't coordinate all those unions together.

And I am not union as such, in the days when the average worker was uneducated and probably didn't speak the language all that well, the unions were an absolute necessity.

They were taken advantage of and they did some great things. But one of the things that really sticks in my mind is, I was working as a student underground in 1967, when they went on strike. And this was after the steelworkers had absorbed the mine, mill and smelter workers union, which had always represented Butte. And that strike was for no other reason than for the steel workers to show their strength.

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And I remember going down to the union hall and watching the process and you know, there would probably be people that would say, 'oh, no, that's not the way it was. But there were two big guys that watched you vote and put your ballot in the box'.

**GRANT**: What union hall did that take place in?

**HOFFMAN**: That's the Silver Bow Club.

**GRANT**: Sure. Yeah, not the Carpenter's Hall.

**HOFFMAN**: No. No. The union was in the Silver Bow Club in those days.

**GRANT**: And the big guys were Rocco and Knuckles?

[00:09:24]

**HOFFMAN**: Haha, yeah. But you know I remember being just outraged at the time because I was raised as a pretty independent person and private rights were everything.

And to have that happen in that day and age was really shocking.

My first shift underground, in the Leonard mine, I was assigned to work with a guy. And almost the very first thing that happened when we got underground is our electric scraper hoist, our slusher hoist, blew a fuse. And he says, 'well, that's it pard, we might as well sit down and sleep the rest of the shift'. And I said, 'well, why don't we just get a fuse and put it in'? 'Oh, no, we got to have an electrician do that'.

[00:10:09]

**GRANT**: Did that frustrate you?

**HOFFMAN**: Yes, it did. Yeah. I was just shocked. Because coming from the small mines, you know, the small mines in central Montana, most of them, it was a 20, 30 mile drive to any kind of supplies. So you made do with whatever you had. And I think that's one of the great advantages of my education was I learned to make do with damn little.

**GRANT:** When was the first time you think you did like some welding, was that as a kid?

**HOFFMAN**: Oh yeah. Yeah. That was a kid. And I watched a lot of people weld, a lot of these guys were jacks of all trades, so they were welders and plumbers and mechanics and pipe fitters and you name it..

**GRANT**: ...and carpenters.

[00:10:52]

**HOFFMAN:**But during one winter and a special, I helped a machinist welder and Lewistown. John Zacker. And he was a Swiss Nationality, another one of those big guys, real character. And he was a real perfectionist. And I can remember being under the welding hood and he'd always emphasize, you had to grind and clean your joints before you welded them.

**GRANT**: Right.

**HOFFMAN**: And of course being a kid, you just throw two pieces of metal together and start welding. And I'm welding away on this thing. And you can't see anything. You're not doing anything but focused on that arc. And he'd come along and just whack me on that welding hood. Knocked me right on my butt. I used to get so mad at him, but, you know, that's the way it was. That's the way you learned in those days.

These guys were all really uncompromising because not only were they raised, you know, starting in the 1800s, they all lived through the Depression. And there was no room for slack. There was no sympathy at all for somebody who didn't want to work. So I got a hell of a work ethic and I have quite a reputation from my younger days as a boss and operator of being a real hard nose.

[00:12:09]

**GRANT**: What year were you born, Larry?

**HOFFMAN**: '45. So I'm not a baby boomer that was before everybody came back from the war. In mining, we always say 'fire in the hole' before we touch off the blast or the boom. So I say I'm a 'fire in the hole-er'.

**GRANT**: And so did you end up having to go to Vietnam?

**HOFFMAN**: No. I actually joined the National Guard right out of high school, because I had a lease on a mine that I really didn't want to lose. And I got down to Fort Ord, California, and I had braces on my teeth and the army decided after a couple of months, they weren't going to be responsible for my braces. So they kicked me out.

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And then when I graduated from college, or when I was in college, a friend of mine and I were both number one and number two on the top of that draft list. And my draft number was 17. So I was right there, but I was in school. I had the deferment, I got out and I got married and I got my draft notice.

So I come here to Butte and I tried to work for the Anaconda Company after I graduated. And then Jim Carden, who was head of hiring, said that 'gosh, Larry, you know, it was all right when you were just working as a student, but we can't hire you full-time because you've got a birth defect in your lower back'.

So I get up here for my physical and they said, 'do you have any defects'? I said, 'yeah, I got a birth defect to my lower back'. So they sent me over to see a local bone doctor. And he sent a note back and the guy looks at it and said, 'go up to room 104, tell him you're a permanent reject'. So that worked out al ight. And one of the interesting things about when Jim told me that, 'he said yeah, this is a real common thing'. He says, 'when you're 37, 38 years old, your back's going to go out'. And it was like he set a clock.

[00:14:10]

**GRANT**: Really?

**HOFFMAN:** Oh yeah. I was down in Las Vegas on a consulting job and woke up in the motel and I couldn't get out of bed. And that back had gone out. And fortunately the guy I was down there for knew this wonderful doctor. And about three treatments and I've never had any trouble since.

**GRANT:**Oh, that's nice. See I'm 32, so I'm worried now. Of course, I haven't been underground since I was 10. I'm curious then, so one of the things in a lot of these oral histories, when we chat with people who've worked underground, a lot of people had a particular focus, something they did. You know, they were a diamond driller. Not a lot of people that we've talked to were contract miners. So they don't, they're knowledgeable about one aspect of it.

**HOFFMAN**: Right.

**GRANT:** You know, and I guess what...

**HOFFMAN:** There's motormen and there's nippers and there's station tenders and..

**GRANT:** So many different...

**HOFFMAN:** Yeah.

**GRANT:** So what hoping to have you do, if possible, is just explain to me front to back the process from going underground in the cage, going down a drift, you know, blasting, mucking, motoring it out, how it gets back up, all the way from where the ore is underground to the smelter. Would you mind?

[00:15:23]

**HOFFMAN**: No, I actually do this all the time. I built the underground mine tour at the mining museum and have given a lot of mine tours.

**GRANT:**  I'd love to go on one sometime.

**HOFFMAN**: Oh, you should come up and we'll go underground.

**GRANT:** All right.

**HOFFMAN:**And then the other interesting aspect is during the folk festivals, I used to go up and be in the engine room at the Original, and you get a whole different aspect of questions from people who were there to listen to music, not there to go to a mining museum.

**GRANT:** Right. Right.

[00:15:55]

**HOFFMAN:** But anyway, back to your question You know, the initial development of a mine is usually a prospector that finds a vein or something interesting. And sometimes they pan for gold. If there was a gold prospect and erosion had taken the gold into the creeks. And then they'd find them what they call the motherlode, the origin of the gold, or it could be lead zinc, copper, whatever. And then they start digging on it.

And depending on the topography, they might have to sink a shaft, or they can start driving a tunnel into the hillside. But eventually a major mine is going to develop into a shaft operation, just because the vein goes down. And the sequence of events is you sink the shaft until you reach a level, usually a hundred feet from the surface. And levels then progress a hundred or 200 feet apart. And you drive a cross cut, or a drift, on the vein, out from the shaft. Then if, when you're in a productive section of the vein, you drive a raise from that level up to the next level, through the vein, following the vein.

**GRANT:**And that would be parallel to the shaft?

**HOFFMAN:**Well, not necessarily. It could be angled depending on the slope of the vein. So the whole purpose is number one, to explore the vein as you go up, because especially in the early days, you didn't have any drilling ahead of you or anything, so nobody can see a millimeter into the rock. So every round is a surprise one way or the other.

So you drive this raise from one level up to the other one, and then you've established ventilation to an area. Because especially in the early days, before they had electricity, there was very little fan ventilation, artificial ventilation. So you had to depend on natural drafts.

[00:17:55]

So now you've got this opening in the vein and then you work out horizontally, both ways along the vein for, you know, however long is convenient. Usually it's not more than 50 or a hundred feet away from the raise, along the vein. And then if you're still in good ore, then you drive another raise farther down, and eventually connect the horizontal workings from that one to your previous one.

**GRANT:** So this is a pretty simple example you're talking about now, which basically would have two drifts. You know, but in Butte as it got more complex and you had the 5,200 and the...

**HOFFMAN:**Oh yeah. Yeah and, but every level in Butte, you know, it's like all kinds of complex things. It'd be like coming to a city the size of Butte and saying, 'Oh, we're going to put a water supply system here. It'd be very intimidating'.

**GRANT:** Yes.

**HOFFMAN:**But when you start from one step at a time, then it just develops in a logical pattern. So that's the way it is underground.

**GRANT:** If we could recap, so you have a shaft and then you have the initial drift and then a raise. Which might, I guess, if you have two...

**HOFFMAN:** Might go to the surface in that first hundred foot level and below that, then the 100 connects to the 200 to 300.

[00:19:04]

**GRANT:** And is that via, is that what a manway is?

**HOFFMAN:**Yeah. And there's three components to a manway. One is the ladder way, which is the man way that people go up and down in. And then there's usually a section that we call the timber slide, where you can raise and lower materials. And then there'll be the ore chute.

**GRANT:**Okay.

**HOFFMAN:**And of course the ore chute is separated from the other two. So the rock dust doesn't spill down on everybody.

**GRANT:** Right, of course. Now the manway, it's not a hundred foot ladder, is it?

**HOFFMAN:**Yes.

**GRANT:** Just up into the...

**HOFFMAN**: Well it can be. Previous to government regulations, which now limit them to 30 feet between landings. The early manways could easily go all the way up.

**GRANT:**Wow.

[00:19:51]

**HOFFMAN:** And part of that was how wide was the vein? The big goal, especially in the early days, was to mine as little waste rock as possible. So you didn't make an opening any bigger than you had to. And you go in some of the old mines, and you're crawling through spaces that aren't more than a foot, 14 inches wide sometimes.

**GRANT:** I don't think I could handle that.

**HOFFMAN:** That was one of the great things I could do as a kid, so.

**GRANT:** Okay. And so can you explain to me then, if say you are following a vein down a drift, and you're blasting there, where does the ore go, once it's say on a motor, if you have motors down there.

**HOFFMAN:**Yeah. Well, on the drift level, whether you load it by hand or load it with a machine loader, it goes into a mine car. And then the mine car goes to the shaft, where either they hoist the mine car itself, or more the case in Butte here, they dumped into underground ore bins called pockets.

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And then the pockets would be loaded into skips, which are long boxes that could be full of anywhere from four tons to 15 tons of rock.

**GRANT:** Wow.

**HOFFMAN:** Hoisted to the surface, and then automatically dumped into the surface ore bins.

**GRANT:** And that is hoisted up via the headframe, the gallus frame?

**HOFFMAN:** The headframe, yeah. The only purpose of the headframe is to hold up those two sheave wheels on the top. Or three sheave wheels, whatever, that transfers the angle of the cable from the hoist on the ground, down the shaft.

**GRANT:**And so would they change out the chippy to a skip?

**HOFFMAN:** Yes.

**GRANT:** Oh, every shift?

**HOFFMAN:** Yep.

**GRANT:**Who does that?

**HOFFMAN:** The service changeover crew.

**GRANT:**There's a whole crew for that?

[00:21:39]

**HOFFMAN:**There was a crew that - they start and end their shift doing that. And in between there, there are the surface tenders that get the materials ready to go underground and everything else. But the headframes had what they called a change-over rig, where they had an I-beam with hoists on it so that they could pick up a skip or a cage, whichever they were doing, off of the cable. Put it off to the side and then put the opposite member - cage or skip on the cable.

**GRANT:** A man would never ride a skip.

**HOFFMAN:** Yes. Yeah, all the cages here in Butte, matter of fact, when you're up at the Steward, if you look at the skips there, they've got a cage on top of them. And the purpose of that is the skip tender rides up and down to the particular level that he's pulling the pocket, they call it, where they're dumping the rock from the pocket, at the shaft, into the skip. And it's his job to run the gate that controls that.

**GRANT:** I see.

**HOFFMAN:** And then if he's, if they're hoisting a lot of rock from a specific level, he'll stay on that level and signal the hoisting engineer to raise that, skip and dump it. And at the same time, in the opposite hoisting compartment, there's an empty skip coming down.

**GRANT:**Oh.

**HOFFMAN:** So the dead weight is in counterbalance all the time.

[00:22:55]

**GRANT:** Oh, I see. So a skip tender spins the entire shift in the shaft?

**HOFFMAN:**Yeah.

**GRANT:** Was there a lot of fatalities there?

**HOFFMAN:** No. Very, very rare to have fatality in the skipping operation.

**GRANT:** Hmm, where would they most likely occur in Butte?

**HOFFMAN:** Oh, in Butte? Especially in the early days, there were cave ins, some kind of a ground support failure. People falling down open holes. A lot of explosives accidents because of the dangers of setting off the explosives with fuse. And of course the big killer in the long-term was silicosis. From the quartz in the rock.

And most people, you know, like if you look at the old underground pictures, there are these beautiful, clear, well-lit pictures because of magnesium powder for the photographer. The instant after that you're plunged into complete super darkness because your eyes are all of a sudden closed for that dark, that bright light.

But after that, you know, there's only one or two or three candles to light everything. And you think about those old drillers, especially double jacking, where one guy is holding and rotating the drill steel and his partner is swinging at nine pound hammer once a second by candle light.

**GRANT:** You got to really trust the guy.

[00:24:22]

**HOFFMAN:**Yeah. And a lot of the injuries are a result of this bad lighting because when I take people underground up at the mining museum, I always make it a point to show them what absolute darkness looks like and then light a candle and show them what candle light is like. You can't see a loose rock over your head. You can't see if there's something you're going to trip over or worse yet, fall down at your feet.

**GRANT:** Yeah.

**HOFFMAN:**And then you throw into the fact that none of the miners wore glasses in those days. And you're probably looking at close to the same percentage of nearsighted people that you are today. And you know, it was talk about natural selection.

**GRANT:** I'm wondering if you could define a couple terms for me. Barring down?

**HOFFMAN:**Barring down, after you blast, especially you know you don't really break out the rock that comes out ready to shovel, but you shattered the surrounding rock so that any fractures or cracks or anything can leave loose rocks hanging.

So you go in with a pointed bar ,with kind of a lever end on it, and start working cracks in the rock. And tapping the rock. Solid rock gives a good, hard ring to it. Loose rock sounds like you're thumping on a bad drum. They call drumming ground. And then as soon as you got that all loosened down, then you're safe to go in and start doing the shoveling or whatever you're going to do.

[00:25:57]

**GRANT:** What about timbering? It always seemed to me that putting those timbers in place, if you're a thousand feet underground, all that matter is above you. Those timbers aren't going to stop that.

**HOFFMAN:**No, and all that matter right above you was actually a very stable substance in most cases. Some places obviously, yeah, you've got really faulty ground or clay ground or something, and you've got a lot of weight to support.

And so your timbering might be as little as just a few pieces of wood put in place to where  you're actually making solid stacks of wood on either side of you to hold up that ground.

**GRANT:** And so, were there men that just did that?

**HOFFMAN:** Timber men, yeah.

**GRANT:** Just timbering.

**HOFFMAN:**Yeah. Yeah. Matter of fact, I was just looking at a bunch of pictures yesterday of some of the beautiful timbering underground in Butte. I mean, every piece of timber, you can't slip a piece of paper in the joints. Perfectly level, perfectly vertical, unless they deliberately put an angle on it to resist sideward motion.

**GRANT:** You know, that's a common theme for me in Butte especially, as I work on these renovation projects at the Carpenter's Hall or a building in Walkerville, you know, there's just so much in Butte that took so much to build that has been neglected.

**HOFFMAN:** Oh, yeah.

[00:27:14]

**GRANT:**And it just, I never went underground, and still it breaks my heart to think of all the work that went into it that's now just flooded forever.

**HOFFMAN:** It is. And I always tell people, you know there's so much criticism of the Berkeley Pit as well there should be. But the two big fatal mistakes made in Butte - one was when ARCO turned off the pumps.

**GRANT**: Yup.

**HOFFMAN:**And it breaks your heart because most of the cost of pumping would have been paid by the copper you could recover out of the water, for next to nothing. I mean, you're run it over scrap steel and you get copper. It's just bad, because it wasn't just the cost that would have done pumping, but the fortune it would have saved in all of the things we're worried about now.

**GRANT:**Yeah.

**HOFFMAN:**Plus the mines would have been available to start up whenever the prices justified underground mining again. Now it will never happen. It's heartbreaking.

And then the other big mistake that was made was when Montana Resources started up, the logical thing for them to do would have been put their waste rock mixed in a straight engineered proportion with their mill tailings, which are 11 pH, they're very basic. Would have gone into the Pit. It would have settled down to the bottom, reacted with the clays. Neutralize the acid and pretty much sealed off all of the influx from bottom.

And the EPA would not give them a write-off on the perpetual liability. And then if they did that, they would have taken a bite out of the PRP liability. It was insane. Government regulations at their worst.

And then after a certain point, when the Pit's filled up, of course, you start that program, you're displacing so much water that you're creating a new problem and raising the level. As an engineer, it drove me insane.

[00:29:24]

**GRANT:**What was the atmosphere in Butte like at the time, when people first heard that the pumps were turned off?

**HOFFMAN:**Oh, devastating. Oh, you look at a place like Butte where you know, a minimum of five, six generations had all worked for one mining company or another, mining was life. All of a sudden it's just gone.

The Pit was shut down. There was no mining in Butte. All the peripheral operations, the grocery stores, the machinists, the equipment supply houses - just cut off.

And Butte was mad at mining. Mining abandoned them.So, you know, the mood was horrible. I mean, Butte was clinically depressed. Truly was. The Lady of the Rockies was a bright spot that cheered a lot of people up, and kind of started things. And then five years later, of course, Dennis Washington, and well, Frank Gardner was the one who had the idea and went to Dennis and said, 'there's this great opportunity here'. And talk about foresight.

[00:30:35]

And that's when the union thing came into play, you know, the head of the union at the time, Frank Gardner got together with him and said, 'we're gonna open, we're going to be non-union'. And the union rep said, 'you'll never do it, Frank. Never happen in Butte'.

And Frank said, 'we've got to have the ability to cross train and have everybody be able to do everything. We can't operate without that'. And so they did it. And a couple of years later, the union guy went to Frank and said, 'God, it just kills me to admit it, but you were right, Frank.

**GRANT**: Do you recall who that was?

**HOFFMAN**: I was just trying to think of his name - mental blank when you get older. I'll think of it in a minute.

**GRANT**: Not a problem. Yeah. Difficult to imagine.

**HOFFMAN**: Yeah, it was a great thing to start up again. And it's been a very stable industry for Butte.

**GRANT**: Quarter of the tax base, in my understanding.

**HOFFMAN**: Something like that, yeah.

**GRANT**: If we could go back underground, I've had trouble with, no matter how many charts I look at - differentiating between a raise and a stope.

**HOFFMAN**: The raise is the initial cut. Everything that's done from the raise to mine the ore is the stope.

**GRANT**: Ah, and so how big can a stope be?

**HOFFMAN**: A stope can be immense. That's one of the things they talk about in the early days of the Never Sweat and the Anaconda mine is that vein structure in places was 80 and 100 feet wide of 76% copper. It's unbelievable.

**GRANT**: If you were working underground and found that, would you just - shit?

**HOFFMAN**: I mean, yeah. I've never done it to that extent, but I was contracting, worked the Broadway mine down by Silver Star, southeast of Butte here. And we got into ore there that was the classic Butte ore. It was pure calcasite with native copper. And we were able to just mine that out of the ground, put it in containers and ship it to smelters in China.

[00:32:40]

And, believe it or not, the ore was so rich, we actually had to put waste in it because the smelters wouldn't take anything above 26% copper.

**GRANT**: What?! How'd you ship it from there, by train?

**HOFFMAN**: No, we put it in containers and put it on trucks and took it down to either Utah or the coast. And put it on trains or boats directly, and shipped it to Japan and China.

**GRANT**: If you had to estimate, how much rock do you think you have pulled out of the ground in your life?

**HOFFMAN**: Oh, I've thought about that, and you know, yeah - hundreds of thousands of tons. Either directly or, you know, crews working for me. At one time my company employed 115 people and we had mines in Lewistown and California.

**GRANT**: Wow. In Northern California?

**HOFFMAN**: Kind of west, or Eastern California on the edge of the Mojave desert, the Darwin mine, which was an Anaconda property.

**GRANT**: Oh really?

**HOFFMAN**: And we didn't produce from there, but we did a lot of exploration work there.

**GRANT**: And back to your first, you know, getting hired in Butte. Can you tell me about that up until when you were bossin'?

[00:33:58]

**HOFFMAN**: Yeah. You know, when I first came to Butte, I was just another student, and the Anaconda company had this great program. You could work on a Friday or Saturday night, and most students didn't know anything about mining, so they were cleaning out ditches and just doing general maintenance work.

But I had a lot of mining experience when I came here. And as soon as they found that out, then I started to be put into working places. And even after I ended my student program, which I probably worked 60, last part of '64 and '65. I got to know enough people around, and especially Bob Cox, who was superintendent at the Steward mine. I'd go up and visit him just so I could watch the engines run and talk to him about mining.

But there'd be guys that were top contract miners. And they couldn't afford to take a day off. So if one of them had something important, like a daughter getting married or something, so they had to be gone for a shift, I'd get a call from Bob and he'd say, 'yey, can you fill in for so-and-so'.

And it was great for me because I got the same part of the contract as the regular miners did. And at that time, take-home pay for a night shift was $18 and change, for an entire shift. And workin' contract, you could always make better than $35. A shift. So it was big money.

**GRANT**: Double.

**HOFFMAN**: It doesn't sound like much today, you know, we're making more per hour now than we used to make per shift. But you know, a lot of times Bob would call me at the last minute, because somebody had dumped a shift or something. And I remember saying to him one time, 'God, Bob, I've got a calculus test tomorrow'. And he says, 'oh God, I'm sorry. I really need somebody'. And I said, 'when can I be there'? I had to repeat two semesters of calculus twice.

[00:36:01]

**GRANT**: Yeah. I hear you there. And so all those contracts where you, like you say, you would end up being partner with an old timer who had a lot of experience?

**HOFFMAN**: Right. These guys were lifelong partners, a lot of them. They knew each other as well as they knew their own families. I talk a lot about the camaraderie that was in Butte, because you had these guys that faced the same dangers, the same hard work underground. And on the surface, the families all had the same concern, in the back of their mind, is the old man coming home tonight?

And the kids, you know they all knew the lingo, but oddly enough very few of them actually knew what the old man did. They'd talk about it, but it's a mysterious world. It's like us  sitting here talking about it and me knowing all about it, and you don't have a clue. You can't visualize it in your head.

**GRANT**: Right.

**HOFFMAN**: And it's the same way. And that's one of the reasons why when we started working on the Steward, that we were overwhelmed by the interest. Because Butte got over this shock, after the shutdown. And then there was this period where, 'eh, you know, Butte's Butte. But then, what did the old man do? What did grandpa do? And everybody's fascinated by it.

And they just love seeing this machinery in motion and hearing the noise again. And growing up in Butte was really different because everybody, you know, you have your childhood and what's in your childhood is normal for you. Well in Butte, the whir of the cables and the sheave wheels, the crash of the ore bins, the whistles, the sound of the fans, the sound of the compressors. When the High Ore compressor plant was running, it ran 72 strokes a minute, just like a heartbeat. And it'd be thump, thump. Thump thump. And it was just like Butte had a heart.

**GRANT**: Wow.

[00:37:58]

**HOFFMAN**: But anyway, so these people grow up and then when it went away, I mean, there were people that didn't sleep for weeks because they were used to the noises. ut the kids, it was all normal. And one of the striking comments I heard was, Ann Finch, who owns the Second Edition bookstore? Her dad was the head of the mining department and a very good friend of mine. She says, 'you know, I was 14 years old before I realized that other people's dads didn't come home with dynamite'.

And that's the way it was. The kids played on the mine dumps. The kids, you know, broke into the old abandoned buildings. That was just a way of life. And in those days, the Anaconda Company hired the Burns detective agency for security. And it was just a joke. These guys were paid and all they did was sit on their butts. And once in a while they might catch somebody, but it just got to be a joke to beat the Burnsies.

**GRANT**: What do you think has renewed this interest in Butte, just the passage of time?

[00:39:01]

**HOFFMAN**: Passage of time. And the fact, like you mentioned at the very start here, these guys are passing away. You know, and that history is being lost. And of course, it's the purpose of the mining museum, to preserve that history. But it's an overwhelming task just from a lack of money. People don't volunteer like they used to, and the sudden realization that, we're missing this whole thing, like recordings of the compressors and the engines and the crash of the ore bins.

So, yeah, it's a great, you know, the history of Butte is almost unparalleled. And the things that grew out of Butte, and depended on Butte. Just last week I went to Arizona and went to Jerome, which W.A. Clark was one of the initial developers of.

**GRANT**: Okay.

**HOFFMAN**: And he went from walking onto the property in 1888, and then he built railroads and smelters. And four years later, there's newspaper reports that say he was making a million dollars a month, profit. Well that is $65 million a month today.

**GRANT**: Right!

[00:40:23]

**HOFFMAN**: It's beyond your imagination. And in a remote area of Arizona, you think about the logistics of getting equipment and timber and people.

**GRANT**: Yeah, he just had immense wealth at the time, to make it happen. Which was derived here.

**HOFFMAN**: F. Augustus Heinze, he came to Butte when he was 18 years old and he built and started the M.O.P. smelter when he was 24, when he just turned 24.

**GRANT**: Have you read Zena Beth's...

**HOFFMAN**: I read the original one. You know, I've always been a Heinze fan.

**GRANT**: Yeah, I love that book.

**HOFFMAN**: Oh, it's a great book and it's probably the most factual of Butte. But at the same time, you've got all these decades since Copper Camp was published by the Works Projects Administration.  And there was so much misinformation.

**GRANT**: There's misinformation in that book.

[00:41:19]

**HOFFMAN**: Oh, lots and lots of misinformation. A lot of it's just pure horse pucky.

**GRANT**: Really?

**HOFFMAN**: Oh yeah. Common tales around Butte, you know. And Heinze was cast as the villain, and he bought these judges, and the judges were these terrible despicable characters. And they weren't, they were impeccable judges. Zena Beth and I have talked about this a lot. These judges, you know, there is absolutely no evidence that they were crooked. There was no evidence they took any payoffs. And almost none of their decisions were overturned.

So you get this picture in your mind and, you know, Judge Clancy in particular. The picture in the paper of him with the big beard and the friend coming up and saying, 'Oh, I can tell you what you had for breakfast'. 'Oh yeah, what's that, bacon and eggs? Ha that was yesterday's breakfast!'

And you form an image, especially I did as a kid. 'Cause I just, I read the book over and over again. You get these misconceptions ingrained into you.

[00:42:31]

**GRANT**: If there's one quality that you know, people of that era, born in the 1800s, you know, the ones you knew, if there's one quality that stands out among them, what would it be?

**HOFFMAN**: Integrity. Integrity by far. Work ethic. There wasn't any room for bullshit. I mean, you had, obviously the mine promoters and the scam artists and the snake oil salesman. But the real working class, you know, they had no choice but to face the facts of life, do the work, just to live.

**GRANT**: I think in Butte especially, the Copper Kings, you know, W.A. Clark is criticized, but they almost get a pass. They're romanticized, but they were the exploiters, you know?

**HOFFMAN**: Oh, there's no doubt about it. But you know, they did a lot of good, you know, there's always a lot of criticism about, oh, they never give anything back to Butte. But they gave Butte, Butte.

You know, and working on the carousel, like I did all the time, you know, 'oh the dirty Anaconda Company', and oh, you know, 'they shut down the Columbia Gardens and then  I know they burned it'. But they don't stop to realize that after Clark died in 1925, and all his properties were purchased by the Anaconda Company, including Columbia Gardens, Anaconda Company maintained Columbia Gardens, until they shut it down.

[00:44:04]

**GRANT**: And what do you make of that accusation of arson?

**HOFFMAN**: I discount it. There was no reason for them to do that. There was plenty of people around that would have been happy to move the Gardens, and it was the company's intention to move the Gardens somewhere else. And at that time, the Anaconda Company was under pretty bad management. Made obvious by their loss of the whole thing.

So the Anaconda Company went from being managed by people who started out working in the mines of Butte and working their way up to presidency. And then they got lawyers involved. And everything went to hell after that.

**GRANT**: Did you ever go to Chile?

**HOFFMAN**: No, I never did. No. I've been to Argentina and Ecuador and French Guyana and most of the Arctic circle, but I never made it to Chile. Always wanted to go down and see it.

**GRANT**: Were all of those trips mining related?

[00:45:00]

**HOFFMAN**: Yes. Yeah. Yeah.

**GRANT**: Have you ever had any close calls underground?

**HOFFMAN**: Oh yeah. I've actually written a history of my close calls underground.

**GRANT**: I'd like to to see that.

**HOFFMAN**: Yeah. One of them, when we were in school, I had a good friend who was from New York and he was really naive. He'd really been sheltered all his life, but he really liked to go explore old mines. And we found out, we got into the Bella Butte shaft, which was right in the middle of Walkerville. And it was an exhaust air shaft. And we go in at night, and here's all this moisture, saturated air blowing out of it.

You can't see 10 feet down the shaft, but there's a ladder going down the shaft. 'Oh, let's go explore the ladder'. So he's ahead of me. He went through six rungs. Just - ching ching ching ching ching ching ching. Fortunately, I taught him to hang onto the side rails, rather than the rung themselves. So he stops and we're just sitting there going, 'oh my God'!

Do we go home? Oh, hell no. We go on down the shaft. And I've often thought in recent years, what the hell would I have done if he'd fallen? What would I have done? You just think, wow. And that's when, you know, they talk about, you know, teenagers and people in their twenties thinking with a different part of their brain. And it is so true. And I look at my students now and some of the things that they do, and I think, I'd be a hypocrite if I criticized them.

[00:46:45]

But yeah, I've been caved in on, and I've had different wrecks, and stuff happens, you know. Live through it.

**GRANT**: What is slime?

**HOFFMAN**: Slime is the mill tailings, after the valuable constituents have been removed and the concentrators say the slime is what they pumped back up to the tailings pond.

**GRANT**: Sure.

**HOFFMAN**: And one of the problems in Butte was the high sulfide rocks, when they get hot enough, the rock itself burns. When you read the accounts of the roasting heaps in Butte, putting out clouds, that's what they were doing is they'd put firewood on these piles of rock. They get it hot enough that the rock itself starts to burn. And that also is what contributes to a lot of the heat in the Butte mines, is the rock decomposition. Even just a slow oxidation generates heat. But if you get that oxidation to the point where it gets hot enough to set the wood on fire, then the wood in turn actually goes beyond the oxidation into the actual burning of the rock.

And there were areas of Butte, that for all I know, are still on fire. But the first real mine fire was during the 1880s and ever after that, it was a constant battle for the companies to control those fires. And you can't, it's like coal mine fires you hear of back East. They have a way of sucking air from the most unlikely places.

So getting back to your question, the slime was used - actually brought back from Anaconda, up until the concentrator days, in railroad cars and dumped underground. And there were crews that would backfill these openings with slime and channel them into these burning areas.

[00:48:38]

**GRANT**: Would that have been hazardous?

**HOFFMAN**: Oh yes. Not so much the slime itself. Although if they didn't build their retaining walls right, it would get up so high and then collapse. And there were people killed in slime wall failures.

But the actual working in the fire country, a change of air pressure, a change of temperature outside, could change the direction of the ventilation. And yeah.

**GRANT**: We spoke with one gentleman who talked about the New York drift. Did you ever hear of that one?

**HOFFMAN**: No.

**GRANT**: I think it was west of the Anselmo. He says it was the hottest place he ever went underground. Denny Murphy actually is, it's a tape of Denny Murphy, if you know who that is.

**HOFFMAN**: Oh yeah.

**GRANT**: And, then he was talking about the New York drift and guys could only work maybe 10 minutes at a time.

[00:49:30]

**HOFFMAN**: Yeah. When I worked at the Leonard, I did a fair amount of work on reopening into the East Calusa fire country. And working on the 34, the 3,800 level, we were reopening, mucking out the fallen ground, retimbering. And we broke through into an area that didn't cave in. Soon as the air got in there, this blue flame started to go along the rocks.

**GRANT**: Ooooof.

**HOFFMAN**: You know, and I told that story for years. And then when I got the underground mine tour going, I hired a guy named Larry Moody, who was another good guy to talk to about mining. And we're talking about things and he tells me this story. So we were partners, but I had no idea who he was.

**GRANT**: What?! That's pretty wild.

**HOFFMAN**: Yeah. Yeah. There's a lot of coincidences that happen like that. One of the great things about mining is it's a real small community, especially these days. That's one of the reasons we have so many environmental problems, is that it used to be everybody knew where things came from. Everybody had a neighbor who was a farmer or a miner, even if they were just gravel quarry or whatever.

Now we've mechanized ourselves to the point where very few people support civilization. So we have a small community. And I like to say that, 'if you don't know somebody, you know somebody who knows somebody, and that's always the case'.

**GRANT**: Yeah. Definitely in Butte.

**HOFFMAN**: Oh anywhere. Anywhere there's mining.

**GRANT**: Yeah.

**HOFFMAN**: You know, even going to Cornwall last year with the mining team, you know, you can make Butte connections right and left.

[00:51:14]

**GRANT**: Oh, wow. How does that influence your, you know, do you have a political philosophy derived from doing this work all your life?

**HOFFMAN**: I would say my whole philosophy is a practical one. There have been a lot of environmental problems caused by mining, but when you really look at it, there's been more problems caused by cities. Highways. Any of the conveniences that we have, that are all based on mining.

I used to give talks to grade school kids. And I'd put a $10 bill on the teacher's desk. And I said, 'you know, anybody that can tell me some aspect of your life that doesn't depend on mining can have that bill'. Never lost one. If it can't be grown, it's gotta be mined.

**GRANT**: Well, we're getting close to when you need to head out to the appointment there. So I'd love to schedule another time.

**HOFFMAN**: Anytime you want to. Yeah. Last week was the first time we've gotten away in the winter time. So most days are flexible, so.

**GRANT**: Okay. I also have a friend who I think has a neighboring claim to your, he has a claim up by your house and his name is Dave Hutchins.

**HOFFMAN**: Oh yeah. Well, Dave, yeah, actually that claim was kind of an interesting story too. The guy that had it before Dave took it and sold one square inch of Montana mining property, for the whole thing. And then I didn't, I never even gave it a thought because he said, 'Oh yeah, you can do anything you want up there'. And then he died and quit paying taxes and Dave got it. Yeah. And I've talked to Dave quite a few times.

[00:52:52]

**GRANT**: Well, and he was saying that you're still mining up at your place?

**HOFFMAN**: No, not so much. I've got a tunnel on my claim that goes way, way back.

**GRANT**: Wow.

**HOFFMAN**: It was originally started to bring water from the other side of the divide, into the placer mines in 1869.

**GRANT**: Wow.

**HOFFMAN**: It's just, it's stuff like that. And you know, and I've talked to Dave, honestly, I said, 'you know, I wouldn't live up there if I wasn't a semi-hermit and I'm not real wild about having a neighbor'. But you know, I'll work with Dave. He's a good guy.

**GRANT**: He's a decent neighbor to have, I think.

**HOFFMAN**: Yeah. And it's interesting because he worked with my wife at the Motherlode.

**GRANT**: Oh, okay.

**HOFFMAN**: Orphan Girl Theater.

**GRANT**: Sure, 'cause his son. I got you. Well, thank you for your time today, Larry. And like I said, we gotta do it again, 'cause as you can tell, I have a lot to learn.

**HOFFMAN**: Yeah, well thanks for the opportunity. I love spreading the word because you know, mining is misunderstood.

**GRANT**: I think so. Yeah. It's really helped me living in Butte, constantly looking east - that reminder of where it all comes from, the cost.

[00:53:56]

**HOFFMAN**: Right. Right. And you know, these big environmental disasters, you know, sure, there were some of them that were caused by greed and carelessness and bad practices. But you have to look at Butte in the context that the technology just wasn't there.

Especially once you crushed the rock and grounded up. gravity took over. We didn't have any bulldozers. We didn't have any pumps. We didn't have anything. And then I don't know whether you read Dick Gibson's article last time about the Great Flood.

**GRANT**: Definitely. Yeah.

**HOFFMAN**: Right there is most of the tailings that went down the Clark Fork.

**GRANT**: That's right. And how do you foresee that?

**HOFFMAN**: Yeah.

**GRANT**: Yeah. It said in that article, Silver Bow Creek was a mile wide.

**HOFFMAN**: Yeah. Unbelievable. And you think about Butte at that time, and all the outhouses that must've been here, the primitive sewage system, which of course just ran into Silver Bow Creek anyway. So there's that whole aspect of just humanity. Not mining.

**GRANT**: Shit Crick, right?

[00:54:55]

**HOFFMAN**: Yeah. And you look at Butte as a world-class ore deposit, and you wonder, were there ever any fish in Silver Bow Creek? No way of knowing.

**GRANT**: Well, thank you again.

**HOFFMAN**: You're welcome. Thank you for the opportunity.

**GRANT**: Oh yeah Larry, it's been great.

**RECORDING of PART 2**

*DATE: March 1st, 2019*

**HOFFMAN**: My shingles in my throat is acting up a little bit. So my voice may crack on you, but hopefully I'll be legible.

**GRANT**: Sure. Yeah. That's all right. No problem there, huh? Appreciate you coming back. Sorry for the difficulties in scheduling.

**HOFFMAN**: Hey, that's all my fault.

**GRANT**: No, it wasn't. I sometimes fail to remind people too. Okay, well can I move this thing a little closer to you? Alright, how much time do you have today?

[00:55:52]

**HOFFMAN**: Oh, an hour or better.

**GRANT**: Okay, great. Glad to hear that. Well, we'll get going then. So thanks for coming back up to the archives. Like we explained last time, you know, these conversations are basically just to have on file. It's for posterity, you know? And so even though it's you and I having a conversation here, I'm hoping that, you know, your answers can kind of speak broadly to maybe researchers 20 years from now that are curious about things.

So I was listening back to our previous conversation. I think where we left off, we were kind of talking about Silver Bow Creek, and the prospect that there might be some kind of restored recreational area in the center of town.

**HOFFMAN**: Sure.

**GRANT**: And I know that you were heavily involved with some recent redevelopment in the center of town, at the carousel.

**HOFFMAN**: Right.

**GRANT**: Can you talk about - I would like to start today talking about that.

[00:56:43]

**HOFFMAN**: Well, the carousel project of course goes back to the days of Columbia Gardens in Butte. And a lot of people, there again fading fast, who have memories of Columbia Gardens, it's kind of shocking to realize you have to be almost 50 years old to remember anything about Columbia Gardens.

So it was shut down after many years of operation and then tragically, a lot of it burned. A lot of hard feelings around town, a lot of assumptions, a lot of speculation about who did it and why, but it doesn't make any difference. But anyway, a group got together and they decided they would like to build a new carousel in memory of Columbia Gardens. And that effort took a long time.

So I got into it because that group was mostly older carvers and dreamers. And there wasn't really anybody in the group that was what you'd call a construction person. So I said I would take charge of construction, thinking it might take a year, a little more. Well, it took better than three years. So anyway, it got done and people are enjoying it.

**GRANT**: And why do you think that was important to do?

[00:58:03]

**HOFFMAN**: Well, because it was a part of Butte that's gone. I don't know if you've read that book, The City That Ate Itself, but that was the whole thrust of that book was, what was once here and is now gone. And the sentiment being what it is, it's a very critical part of Butte's psyche. To remember the neighborhoods and the events and the places to go, and that are gone, just plain gone.

**GRANT**: And so would you say the carousel is an effort to try and heal that psyche?

**HOFFMAN**: Yes. Yeah. It does a double duty, I should say, that helps the older people remember, makes them a little sad, but at the same time happy. And plus it's creating a whole new generation of memories for the younger people.

**GRANT**: Maybe we're beating a dead horse, but did the company burn the Gardens?

**HOFFMAN**: I don't, I don't believe it. There'd be no reason for 'em to do it. I have a very dear friend who claims he has a written statement from some employee of the Anaconda Company slash, well, it would have been Anaconda at that time, not ARCO. But anyway, over at the Anaconda company that, he was involved in doing it, but he can't reveal it until after this guy is dead. So I take that with a grain of salt too. There's just no logical reason for it.

[00:59:36]

**GRANT**:  Because the ground it was on wasn't valuable, or...

**HOFFMAN**: Well, because the ground it was on was already theirs. And what most people don't stop to think about, it was originally built by W.A. Clark, who paid all of the operating expenses until he died. The Anaconda Company bought his assets and the Anaconda Company was the one that maintained it from 1925 until 1973. And it wasn't cheap.

So they had a vested interest in it. And at that time, virtually all of the Anaconda employees were Butte people. They had their own memories of the Columbia Gardens when they were young. And it just makes no sense. There was no business reason to do it. There was no emotional reason to do it. I think knowing Butte, more than likely there were some Butte kids out there messing around and things got out of hand.

**GRANT**: Yeah. I'm curious if you could speak more to Butte's psyche, could you elaborate on that.

**HOFFMAN**: Oh yeah. Well, Butte's pretty famous or infamous for its psyche, depending on how you look at it. It was a different kind of town from the very start. There'd never been a city built right on top of an ore body to the extent of this one. And how huge the orebody was and what it meant to America at a pivotal, several pivotal points in the history of the United States. And Butte people are very proud of that. There's a lot of resentment over the scars left. There's also a lot of gratitude, deep down, for all of the payroll that was paid. Taxes that were paid. Butte has a lot of things that were simply due to the massive amount of money that was here.

So, you know, mixed feelings. And then of course, that gets altered with time. When you take something like Meaderville away from people who grew up in Meaderville, boy, that's a bitter pill. And then that spreads out among even newcomers who think, 'oh, what a terrible thing to do'. And you know, what do you do? Change is change. And a lot of it isn't pretty.

Then as you travel around to, especially other mining towns, every mining town has ups and downs. And during boom times, boy things are great. And the opposite end is not very pretty.

[01:02:18]

**GRANT**: Speaking of that book, Brian James Leach, he did an interview with Frank Gardner. And that interview is on file here at the archives.

**HOFFMAN**: Oh interesting.

**GRANT**: In that interview, Frank Gardner acknowledges that the pit was never really profitable from the beginning. That's what he says. And so after I learned that, it kind of put the destruction of those neighborhoods in a new light. 'Cause it wasn't like it was a necessary sacrifice for the company to make money. They lost money doing it.

**HOFFMAN**: Well, and the flip side of that is, is Butte hadn't made money period. For many years. And that's actually what happened to the Anaconda Company, is their mine in Chuquicamata, Chile carried everything. Absolutely everything. It was a fantastically successful mine. And it's still running today, still expanding and actually just now going underground. The opposite of the Butte history. And when Anaconda lost Chuqui, they lost everything.

But what I was going to say a second ago was the flip side of the Anaconda doing the Pit, is they were actually doing everything they could to keep Butte running. The things, the benefits that they gave their employees here, far and above what they had to, you know, it was just a God-given right, you could keep whatever you could steal from the mines.

So there's so many houses here in Butte that are made out of plumbing in lunchbox-long sections of copper pipe. There's houses that don't have a two by four in them because they're two inch lagging stood on end to make the walls. You know, the stories go on and on. And back to, I think we mentioned last time, the Burns detectives actually hired to prevent that sort of thing, but there again, it was just a token gesture.

[01:04:09]

So yeah, you can look at the Pit, the destruction of the Pit, destruction of neighborhoods. But at the same time, you've got to look at the families that it supported. College educations generation after generation. And yeah there's good with the bad.

**GRANT**: Can you give us a recap of your work history?

**HOFFMAN**: My work history? I think I talked last time about having hay fever when I was a kid.

**GRANT**: Right. And that's why you went underground.

**HOFFMAN**: That's why I went underground. So I spent a lot of time in central Montana working with these small miners who were all old timers. Saw the history of things from hand steel to jack leg drills, and candles to electric lights. And it was a very good education. So yeah, there was a whole group of them that I helped out whenever I could. And as they got older and I got older, I was able to do more and more things and didn't make any real money, but got a hell of an education.

And then I started out - one of these old guys wanted to drive a tunnel into what was just sure thing ore body. And so he hired me. And so I formed my company, Blue Range Mining Company, when I was 14 or 15. And my mom had to co-sign everything cause I was under 18. But got a real education in business and preparing for the unexpected and just worked from one thing to another and stayed in that line of doing things for different people. Until I came here to go to college in 1964.

[01:06:00]

And during my college career, I worked for myself. I worked for other people. Did other things graduated in '69 and went back to central Montana to work a historic gold mine there.

Got married the next year, kept at it until I went broke. Went to work for an oil company because that was the only thing that was going on at that time. And the company got interested in the mine, and so I leased the mine to them and went back to working on mine. And kind of went from there, got away from that. Because the owner of the company was kind of an odd fellow and we eventually couldn't get along. So I went into other contracting work and consulting engineering. And pretty well stayed with that all my career.

**GRANT**: You never did work for Anaconda, then.

**HOFFMAN**: I worked for Anaconda when I was in college, as a student miner. And I had the advantage that I had a lot of mining experience when I came here. So, whereas most of the students were just learning about underground, first time underground. I had the ability to work at a regular mining job. And once a lot of these good contract miners found out that I was strong and young and actually knew what I was doing.

**GRANT**: Decent hand.

**HOFFMAN**: Yeah. If anybody had a Friday or something, that they wanted to go to a wedding reception, or a wedding or whatever, I'd get a call from them or one of the superintendents, Roy Garrett, or Bob Cox, up at the Steward. And they'd, 'hey, you want to work a shift'? I'd say, 'gosh, I got a calculus test tomorrow. Yeah, sure. I'll work'. So my grade point suffered, but I made a lot of memories.

[01:08:03]

**GRANT**: And what about your time in college? Did you actually learn new things or was it mostly like a rubber stamp on the career you had already kind of built for yourself?

**HOFFMAN**: Ah, you learn new things and you know, you're hearing more and more these days that college is really overrated for a lot of people. And for me, the great advantage of college was the degree gave me credibility, from an engineering standpoint. And also had a chance to meet a lot of great people, and do some of the technical calculations that are necessary. But the big thing about college for me over the years has been the camaraderie and the people you get to know.

**GRANT**: Yeah. You know my first experience seeing a a hoist house actually operating was because of you, you know, here in Butte. And so I'm curious, back in the day, when the mines were going, what was it like in the hoist house? Was it busy? Was it quiet? Was it, were people joking?

**HOFFMAN**: Oh, yeah. Well, it depended on on the hoist house, the time of day, the condition of the mines at the time. Yeah, back in the day, the engine rooms were really the heart of the operation. And the company and the operators took great pride. Those engine rooms were literally so clean that most women I know wouldn't have balked at eating off the floor. It was that clean. It's hard to see them. It's hard for me to look at them now.

But yeah, by my terms, most of them were relatively quiet. but Louis Loushin talking about operating the Steward hoist, the main hoist at the Steward, said, 'boy, it was really noisy'.

But when I was there studying in the corner while I watched it operate, you know, they'd open the valve and then it just was whoosh whoosh whoosh whoosh. Click, click click. And the whir of the cable. And the ring of the bells. I thought it was just amazingly quiet for the size and age of the machines.

[01:10:19]

**GRANT**: Are there similar machines anywhere in the world?

**HOFFMAN**: Oh yeah. Virtually, every mining camp has got hoists of some kind or another. The ones driven by steam are getting scarcer and scarcer. There's only one steam hoist I know of operating in the United States. Quite a few in underdeveloped countries, especially around the world. But the big electric hoists have gotten bigger and better. And It's pretty amazing to see a hoist compared to one of the big electrics here. Like the Anselmo. Now the operator just sits in a comfortable chair like this, in front of a computer console, and at most he's got a couple of joysticks. And it's a long way from the engineer having to stand to have enough leverage to pull those big levers and pedals and whatnot.

**GRANT**: Sure. So what's in store at the Steward? Are we ever going to get to ride a cage?

**HOFFMAN**: No.

**GRANT**: Oh!

**HOFFMAN**: No. You know, it's a sad story. But the world these days is run by lawyers and insurance companies. Sad fact. And a lot of the things that we do anymore. most of the risk has been taken out of. And that's a real disadvantage to a lot of, especially younger people, because they never find out what their capabilities are or where the limits of the envelope are.

[01:11:49]

I see it all the time in my students up at Tech, that every year they come a little less practical. A little more drawn into the world of video games and computers and electronic communication. And from my perspective, I'm like the old guys that I used to work with, you know? Now I'm the aged one, looking back on the way it used to be, back in the day. And a lot of it is tough, really tough.

**GRANT**: Tough because you think it deprives these young people of some opportunity?

**HOFFMAN**: Yes. Yes. And there's a lot of pressure on kids these days to get a college degree, no matter what it's in. Going deep in debt to find they don't have an employable degree. Or the opportunities are limited, and go back to school for a master's and a PhD and still end up not looking. While you've got graduates that are from Highland College and lineman mechanics and things like that have virtually got a guaranteed job.

You may have seen the memes on Facebook about the guy who spends a fortune on college. Can't get a job. And then the lineman making $80,000 a year and disconnecting the other guy's power.

**GRANT**: I'm not on Facebook, yeah, but I get the picture.

[01:13:19]

**HOFFMAN**: Yeah. But there's a lot of truth to that. And you know, it's a shame that people are becoming less and less practical and more and more dependent on technology. Which brings us full circle back to mining again. We got nothing without mining. Everything depends on mining.

**GRANT**: You mean everything in an industrialized society, or?

**HOFFMAN**: Anything. I just had a group of students up at the underground mine at Tech, and I told them that I used to give a lot of talks to, especially grade school students. And at that time, I'd put a $5 bill on the teacher's desk. And I'd say, 'I'll give this to anybody that can name any part of your life that doesn't depend on mining’.

Never, ever lost a bill. And I didn't lose it last week either. Everything. If it can't be grown, it's gotta be mined.

**GRANT**: What about things like love?

**HOFFMAN**: Well, love is a basic human feature, you know? That's the thing, it's gotta be part of your physical life.

**GRANT**: Sure. Sure.

**HOFFMAN**: But you know, you look around and imagine that you go back to the Stone Age and the caveman that picked up the first rock was the first miner. And you try and imagine you know, you can break off a stick and beat a rabbit to death, but then you basically eat raw. And separate the fur from the meat, with your teeth. The Indians used obsidian for arrowheads and spears and things like that. You mine the obsidian.

**GRANT**: So you've seen, I assume - Zena Beth was telling me downstairs that you mined in Alaska.

**HOFFMAN**: Yeah.

**GRANT**: Can we talk about that a bit?

[01:15:11]

**HOFFMAN**: Yeah, I was actually up there four years. First time I went up, I was working for another guy who turned out to be a real shyster. And the next year I got hired to run the operation, but it was the farthest north underground mine in the United States. And the mine was a very rich gold mine in a fault zone in permafrost. University of Alaska said that the ground was frozen 2000 feet deep. This is 80 miles north of the Arctic circle, about halfway between Fairbanks and Prudhoe Bay.

And so for three years, I ran a camp job, no road access, everything had to either be cat trained in the early spring and April, or else flown in later.

**GRANT**: And where did you reside?

**HOFFMAN**: There was a a camp that was originally set up by a guy named Frank Birch, who was the first one to develop the mine, in modern times. He built a couple of airstrips there and built a mill and did a lot of the underground work. And then ironically ended up getting killed landing his airplane on the airstrip, right in front of his family, watching from the porch.

**GRANT**: That was before you were employed there?

**HOFFMAN**: Yes. Yeah, that was in - I went up there in '79, the first time. And I think that was '74, '75.

**GRANT**: Once you're underground, is it pretty much the same, no matter where you are?

**HOFFMAN**: Pretty much, yeah. Up there it was very different 'cause ice was everywhere. I mean, you could go underground and look at gold in the rock in the wall, with the ice crystals.

**GRANT**: That's pretty different than say, like the Chinese laundry here.

**HOFFMAN**: Oh yeah. This is just the opposite. Yeah. And a lot of the guys that I took up there were Butte miners. And we'd talk about that a lot, that just the opposite, you're bundled up for the cold.

**GRANT**: And what's the hoist like there? give me a rundown of the...

[01:17:08]

**HOFFMAN**: There was no hoist there, that was strictly adits, driven horizontally from the surface.

**GRANT**: Oh really?

**HOFFMAN**: Yeah.

**GRANT**: At a downward angle?

**HOFFMAN**: No, very level, very steep country up there. So you had a lot of relief to work and what we eventually established was, is these veins, as veins do outcrop on the surface, you could really follow the trend of these veins, even on an aerial photograph. And in the first hundred feet or so, they were very wide and very rich. And then the next step obviously is to go down the mountain and drive a tunnel in and get a lower access on it. And every vein that we prospected up there went from several feet wide of several ounces per ton, to four to six inches of less than half an ounce.

**GRANT**: Oh really?

**HOFFMAN**: Yeah. I mean, it was literally just - bang. Just in, in 20 feet. 20, 30 feet. It would go from being 10, 12 feet wide to being six inches wide.

**GRANT**: Wow. What happened there?

[01:18:09]

**HOFFMAN**: It's just geology, just the way things worked out. At the same time we were there, there was a Canadian company that was doing placer mining in Tobin Creek, which was where the camp was. And there was quite a bit of gold there, but since then, another company has gone over to the other side, to the Little Squaw, which is what the district's named after.

It was prospecting clear back in the 1890s, mined in the 1890s, and this company last year, I think took out 17,000 ounces of gold. Which is quite a bit of money these days.

**GRANT**: $1300 an ounce.

**HOFFMAN**: Yeah, but at the same time, I think it cost them more than what they got.

**GRANT**: I see. And you said you were there three years

**HOFFMAN**: Right.

**GRANT**: Is it gonna pretty much be played out by this time?

**HOFFMAN**: The underground I don't think has any future at all. There's always something we could have missed. But we spent quite a bit of time and money, diamond drilling and driving these tunnels to explore the lower levels and universally got the same negative answer.

**GRANT**: Can you explain to me the process of diamond drilling?

**HOFFMAN**: Diamond drilling is a rotary process that uses a tubular drill rod. And at the head of that rod is a core barrel, with a diamond impregnated bit with an open center.

So as it goes into the rock, it makes a hole by cutting out that ring outside, but it leaves the center part pretty much undisturbed. So after you've gone five feet or 10 feet, however long the core barrel is, then you stop drilling and you snap that off. Bring that core barrel out, empty it out and go back in again. So you've got an actual rock record of what you drilled through.

**GRANT**: And how big around is the core then?

**HOFFMAN**: It varies. The smallest core is about three quarters of an inch in diameter and they go all the way up to where some of the oil field cores and whatnot are better than a foot in diameter.

[01:20:13]

**GRANT**: Wow. And as you're pulling those out, you just stack them?

**HOFFMAN**: Put them in a box with separating segments in it, so that each one can be labeled as to the footage it came from.

**GRANT**: Up at Tech ,was that one of the things you learned how to do, was read those?

**HOFFMAN**:  No. I learned all that from the nuts and bolts guys that I learned everything else from.

**GRANT**: And who were some of those guys, if you recall, by name?

**HOFFMAN**: Oh, there's a long, long list. Frank Bryant was a mining engineer who graduated from South Dakota School of Mines in 1900. And he went to work in Idaho. And then he eventually became partners with a guy by the name of Hardrock Coolidge, and opened up the Spotted Horse mine that I ran when I got out of college. And a lot of my work was based on his stories of the mine.

And there was a guy named Walter Lehman whose family was very famous in mercantile, in the early days in Montana. And he got absorbed into mining in the Little Belt mountains and spent the family fortune doing it. And then lost everything because he was in a runaway truck and was very badly beat up. He ended up his life living in what used to be the servants quarters of his family mansion in Lewistown. Very sobering story, but a great guy. Very intelligent man. All of these people that I worked with, that's probably their one thread is they were all very intelligent. Very independent people.

They weren't the kind that was satisfied being a miner in Butte, or working for somebody else by God, that carrot was always out there. So the the famous saying was, 'you're just a foot from a million dollars, or a million feet from a dollar'.

[01:22:22]

**GRANT**: Would you say that, you know, you caught that bug? That, you know, it's out there somewhere and I just gotta...

**HOFFMAN**: Oh, absolutely. I mean, you know, it's what keeps a lot of people going, and people that go to Las Vegas or, you know, whatever the dream is, you know. That carrot's always out there. And I'll tell you what, there is absolutely nothing more thrilling than going to all the work and effort of driving a tunnel or sinking a shaft or doing whatever, with this target in mind. This geologic goal. And that last round, walking in and finding ore, all over everywhere, you know. And it's probably, like lead zinc ore is pretty massive, and very sparkly. But to go in a high grade gold mine, where everything's much more subtle, but boy, that gold just jumps right out at ya.

And let's see, what was it? February, I guess, we went down to Arizona, to the gem and mineral show in Tucson.

**GRANT**: Okay.

**HOFFMAN**: And there's some samples down there of native gold from all over the world that'd just rip your eyes out.

**GRANT**: What is the appeal of gold?

**HOFFMAN**: Gold of course, is the stuff dreams are made of. The ancient alchemists were always looking for the magic elixir to turn base metals into gold. Gold, it doesn't tarnish, doesn't disappear. All of the gold that was ever mined is still in existence somewhere. Maybe under the ocean or somewhere, but gold is virtually indestructible.

So for that reason, it's used for jewelry and in our modern world, it's one of the bases for electronics. All our cell phones have a little bit of gold in them. Everything's got a little bit of gold in it.

**GRANT**: Yeah. What about its tie to monetary systems? And how do you feel about our country moving away from that?

**HOFFMAN**: Well, you know, there's advantages and disadvantages to that. And when that was a big boon to gold mining ,for years and years, the price of gold was $20 an ounce. Up until 1934. And then Roosevelt almost doubled it, to $35 an ounce.

Well before inflation and everything else set in, and World War II came along, boy every mine in the country all of a sudden had twice as much value as it did. And not only that, but technology got a lot better.

But yeah, of course he basically at the same time halved our backing of gold for the dollar. And called in all the gold dollars that everybody was willing to part with. But I think that only something like 22% or something actually got returned, of what was supposedly in circulation.

But now you see the effects today in our multi-trillion dollar debt. You know, if you and I had the ability to budget our lives, like the government does, we'd have a lot more flexibility in what we do.

[01:25:42]

**GRANT**: I'd have a lot more assets.

**HOFFMAN**: Oh, well, yeah. And liabilities, but the liabilities are pretty well out of sight. So yeah. But you know, and certainly you can make an argument that it was necessary, that it's worked out alright.

But if you look at the crisis in 2008, where these illusions got created and taken advantage of, that never would've happened on a hard currency. Except in 1929, you still had a gold backed economy and it still went to hell. But it was all because of paper speculation.

**GRANT**: Right. I'm curious if you could speak to that, you know, obviously you find a lot of value in the tactile work of industry. But so much wealth nowadays and maybe forever in this country has been generated by speculation.

**HOFFMAN**: It's true.

**GRANT**: How does that settle with you?

**HOFFMAN**: It's a hard thing to say because the country has always been based on speculation. But until the electronic age, you might say here, all of that risk, all of that speculation was for hard things. But you know, we got railroads, we got all these things, the transcontinental telegraph, blah, blah, blah.

But for instance, I'm just reading the history of the Comstock lode, which started in 1859. And millions and millions of dollars at a time when a million dollars was really a million dollars were just completely blown on speculation and dishonesty. And there were a couple of crashes that resulted on it.

[01:27:33]

And if you look at F. Augustus Heinze, when he left Butte and went to New York, he went from a world that he knew intimately well and was a genius at, to a world that was controlled by bigger sharks than he was. And all of the losses were on paper.

**GRANT**: But it ruined him.

**HOFFMAN**: Ruined everybody. Yeah. It ruined a lot of people. Ruined a lot of little people. And so yeah, there's always been that kind of speculation and it gets easier and easier as the currency becomes less tactile.

**GRANT**: Sure. Well, I'm wondering if we could shift back to Butte, and that topic of what's lost in Butte. And I guess the more I learn about what's lost, you know, like the Murray Hospital that was right here, or the Success Cafe where I can never go, or the board of trade. You know, I just walk down the street in Butte, and I have the sense that more is gone than remains.

**HOFFMAN**: You know, you could probably look at it that way, but a lot of what is gone, is not only no longer necessary, it's no longer in demand. You know, you see it all the time with these little businesses that open up with all the dreams in the world, and a lot of them are opening up to recreate something in Butte, and they almost always fail.

[01:29:00]

I tell people if all of the dreams up and down Park Street were tangible, you'd need a bulldozer to drive up and down the street. A lot of people still have dreams. Everybody has dreams, but more and more, there's less practicality, it seems, to these things because it's one thing to be a dreamer and another thing to have the ability to carry out that dream and to stay focused on what people want. If you're gonna retail something, it's got to be in demand and you've gotta be good enough to sell it.

So in the day when there were 17,000 miners working underground in Butte, and that was just the tip of the iceberg, because there were all the people that worked on the surface, there was all the people that worked in supplies and grocery stores and restaurants and bars and all that. Yeah, you could support a town that had a bar on every corner.

And everybody walked. That's the other key thing. If you look at the old pictures, everybody wore a hat, right? You had to wear a hat. It could start raining any time and you couldn't just climb in your car. So it's a whole different world. Even the vehicles, excuse me, when you look at the days of hats, ladies hats and men's top hats and everything, the original vehicles had huge cabs to be high enough for a hat.

[01:30:49]

And then as streamlining came in, became more compact, was more available. There was less reason to wear a hat and it was downright inconvenient to be wearing a hat in the newer vehicles. So one thing leads to another, leads to another.

**GRANT**: Do you think people such as myself, newcomers, so to say, to Butte can be nostalgic for something they never had?

**HOFFMAN**: Oh, certainly. Yeah. It's easy to be nostalgic, you know, that's the whole key of of tourist destinations, I guess. That's the reason that most of us go to Europe, is to see the Roman empire and France and its glory and even the Russian czars' times, you know? Yeah. You can say, 'Oh man, look at that'.

So, yeah, you know, is it nostalgia? Is it a sense of history? Is it a sense of awe to see what was accomplished by those people in those days? A combination of the above.

**GRANT**: I'm definitely in awe of just the amount of rock they pulled out of the ground here, you know?

**HOFFMAN**: Oh yeah. It's incredible. You know it's approaching a cubic mile of rock. When you look at the tailings and think of all the tailings you can't even see you over at Anaconda.

**GRANT**: Yeah.

[01:31:55]

**HOFFMAN**: And the pile of rock up behind the Berkeley Pit here, and all the things that are buried underneath that pile or excavated by the Pit you know, it's incredible.

**GRANT**: I just wish, and I know that you provide some glimpse of the underground, you know, up at Tech there. But I just wish so badly I could ride a cage. And so everybody that we talk to that had a chance to, I just ask them again and again to just explain to me what it was like, you know?

**HOFFMAN**: Oh yeah, well, you know everybody says, 'well, the cage is like an elevator in an office building'. Well, except the office building elevator is quiet and clean and secure.

And you can't see anything outside the walls while it's in motion. When you got on a mine cage, especially in the early days, they were wide open, there was literally nothing between you and the timbers that are flying by you except maybe a horizontal bar.

And so it took a certain amount of common sense just to live through the experience.

And they ride on the guides in the shaft. They can't be too tight or they'll jam as the wood swells and shrinks or whatever. So they rattled their way down. But mostly - just a whoosh, just a once that thing starts, it's like the world drops out from underneath you. Then you go faster and faster until the timbers going by you are just a blur.

And yeah, if you dwell on it, you think about, 'oh, these guides are only held on by bolts as water corrodes metal. This has been an operation for how long? When was it last checked'? And you can just drive yourself to panic. And I've seen it happen a lot of times.

**GRANT**: People panic.

[01:33:42]

**HOFFMAN**: Yeah. Yeah. New hands that are signed, 'well, God this money is good in mining. I think I'll go mining in Butte'. And their first trip down the cages is their last trip. For people that are nervous and worry about those things, it can be very, very disconcerting.

**GRANT**: And what about once you get off the cage at the station?

**HOFFMAN**: Well, yeah, then you know, like for me, I can probably give a better description than a lot of people can because in the mines that I worked out in central Montana, there was the only one place that actually had a cage or a bucket to go up and down in, and everything else was walk in. All the mines were naturally ventilated for the most part, they were relatively cool because they weren't that deep.

Come to Butte and go to work for the first time in the Leonard mine, and get dropped down to the 2,400 foot level. And the fans are screaming at you. The humidity is near a hundred percent. Everything is moving all the time. There's ore trains going by, there's people climbing off the cages and just disappearing into these tunnels, bleeding off the station to go to the different working places.

You start walking with your partner. You're assigned to somebody in the lamp room. So you've got this guy that knows his way around. And he starts walking and you go to this way and then you turn that way and then you take that one. And in two minutes you have no idea where the hell you are. No idea at all.

[01:35:12]

And in the meantime, there's water dripping down from above and you find out later in the day that that's acid water. And it eats right through your clothes and will actually cause sores on your skin to the point where they will fester right down to the bone, if you don't take care of them.

And then the whole operating system is different. The small miners of course, just worked for themselves. And you come to a place like Butte, that's highly unionized, probably over unionized, because you had to have a specialty union to repair almost everything and maybe two or three.

And they talk about the Berkeley Pit, a shovel going down, they had to have 15 different crafts there to work on a shovel. And that shovel might sit there for a week or more, because you couldn't get all those people there at the same time.

But my very first shift underground, we go up in this stope, where we're mining ore, and we have electric scraper hoists there to scrape the hoist from the vein, into the ore shoot to go into the cars. And it just quits running right off the bat. And the miner says, 'Oh, blew a fuse. We can sleep the rest of the shift'. And I said, 'well, why don't we just go get a fuse and fix it and get back to work'? 'Oh, no pard. That's the electrician's job'. You know, it was a completely different world for me.

**GRANT**: Did you go to sleep then?

[01:36:38]

**HOFFMAN**: We just sat around actually. I said, 'well, gee are you really tired? Or will you show me some stuff?' And so he took me around to some other working places and showed me how different things worked in Butte and whatnot. So it worked out all right. But yeah, it was a completely different world.

**GRANT**: Did you ever get the sense that human beings shouldn't be down there?

**HOFFMAN**: No.

**GRANT**: You know, because like I say, the acid water, you know...

**HOFFMAN**: No, it's just the way the conditions are. It's just the chemistry and the physics and everything else involved, that's true in the whole rest of the world. But in a lot of ways it's more unnatural to be in a high rise office building.

**GRANT**: The Leonard is the one they dynamited, right?

**HOFFMAN**: The headframe, famous headframe yeah.

**GRANT**: They scrapped.

**HOFFMAN**: Yeah, but that was the original, well, I shouldn't say the original. That was the pre-World War II headframe. The World War II headframe is still standing over the Kelly. So the headframes were moved all over. The Hill, the hoists were moved all over. They really didn't scrap much of anything in those days, unless it was totally worn out. Or it got to the point where the underground mining was declining.

[01:38:01]

**GRANT**: Were you in Butte when the Leonard came down?

**HOFFMAN**: Well, actually, I wasn't, I think I might've been in Alaska when the Leonard came down. I don't remember what year it was. But I was somewhere else when that happened, 'cause I wasn't here.

**GRANT**: Did you hear about it?

**HOFFMAN**: Oh yeah. Yeah.

**GRANT**: What was your reaction?

**HOFFMAN**: Everybody was telling me about it. I thought it was a real shame, you know, and it was a botched job. It went the wrong direction and it ended up being a big tangled mess and it would have been better off just to cut 'em down. You know, I've demolished several headframes, I've moved several headframes, and it was just a botched job. Kind of a shame.

**GRANT**: Why did they tear down all of the related buildings around the headframes here?

**HOFFMAN**: That was kind of a misguided, well, it was two stages. I will say that the last manager for the Anaconda Company/ ARCO went on a big binge to reduce the tax rules. That was the driving force.

**GRANT**: Who was that?

**HOFFMAN**: Bill Thompson.

**GRANT**: And is he still around?

[01:39:03]

**HOFFMAN**: Yeah, he was a real cut-throat guy and he went on to make multimillions in different mining deals around the country. So, yeah, he was a, you might say the last in the line of quote unquote robber barons of Butte. He didn't have the imagination or the risk capability of a Heinze or Clark or Daly, but he was in a position of power and exercised that power to the great detriment of Butte.

And then the second part of that was, after all the operations were shut down and it became a Superfund site, then they were pretty overzealous in the reclamation efforts.

**GRANT**: Can you elaborate on that?

**HOFFMAN**: Well, there were a lot of things torn down that should've probably been saved - like what comes to mind mostly is there used to be a huge set of ore bins on the Mountain Con. And early, early in the reclamation efforts, they dynamited those over. And they laid there for a good 15 years. Yeah. And they were good solid structures and they are now a missing aspect of the history of mining in Butte. None of the headframes have the ore bins left except for the Anselmo and the Travona down here, this small ore bin there.

**GRANT**: On the Lexington, are those ore bins?

**HOFFMAN**: Yeah. The Lexington, I'll take that back. The Lexington has ore bins, yeah. But like the High Ore, I mean you can't imagine the difference in the High Ore from the way it was in the sixties. It was just a ventilation shaft. It wasn't being operated, but all the buildings were there and there was so much history there. I don't know that you read my articles in the Butte Weekly or not, but the last one, I talked about the Hawksworth bit. And Hawksworth had a manufacturing yard, which was just east of the Diamond. And even when I came to Butte, it was the salvage yard for the Anaconda Company, but it was still the Hawksworth yard. It was just a tremendous piece of history and just wiped out.

[01:41:24]

**GRANT**: Who tore these buildings down?

**HOFFMAN**: ARCO.

**GRANT**: And they would contract...

**HOFFMAN**: ARCO or the EPA contractors. You know the miles and miles of railroad track  - one of the things I did in the '90s was, there was a tourist railroad here. The Never Sweat and Washoe railroad that ran from Rocker up to the Kelly mine, on the BA and P tracks. It struggled and finally shut down. And one of the directors came to me and said, 'well, what do you think about this?' And I said, 'well, that looks like fun'. So my son and a couple of friends and I resurrected it, put a lot of money into it, a lot of money. And if there had been, the truck stops, the travel stops at Rocker, like there is now, it would have been a mint. It would have made money, hand over fist. But at that time, Rocker was just a dead place.

And then we got involved with the Federal Railroad Administration regulations. And if you had a crossing over any street, then they had jurisdiction over you. And the featherbedding regulations were just incredible.

So eventually, I just shut it down. And then the president of the tourist railroad corporation, one year decided he didn't need to pay the corporate registration fee of $25. And they took it back, turned it into a walking trail.

So that equipment's still sitting up at the Anselmo. The trains that I built. Some days it's okay to go up there. Some days, it's pretty tough to... There again, dreams that litter their landscape.

**GRANT**: Could be the title of a memoir.

[01:43:15]

**HOFFMAN**: Yeah.

**GRANT**: You know, when I first moved to Butte I found a spot in the fence around the Bell Diamond where I could go under. And I'd pretty frequently go up there and just walk around in the mine yard. Because I just, I love being close to the headframes. And even the Original, I don't think there should be a fence around it. You know? I'm sick of the fences, I got to say. But it just again, there, it felt like a place that was once so busy.

**HOFFMAN**: Oh.

**GRANT**: And now it's just so dead quiet. And either way, I really want to spend time there, but I have no connection to the place and it's painful to be there. So I'm just trying to imagine...

**HOFFMAN**: That's interesting. Yeah, that's interesting you would say that.

**GRANT**: It must be hard for you to be going around town, and all these sites you have connection to.

**HOFFMAN**: Yeah. And of course it fades into the background most of the time, but then something will come up and just rip your heart out, thinking back to the way it was, the way it should still be.

**GRANT**: Are there particularly painful...you know, the Anselmo sounds like one, the train there.

**HOFFMAN**: Yeah. Yeah. That was a hard pill to swallow, because we put a lot of work into that and a lot of money into that. I probably lost $150,000 on that deal. And just to have it lost because of one stupid act, it was pretty tough to look back on. But that's the way it is. You move on, other things will come up. So.

But it's really healing and helpful to me to be allowed to work on things like the hoists at the Steward and putting up the Christmas decorations on the headframe. Being part of bringing back some of those nostalgic points.

Yeah just to have the practical education, the ability and the credibility to be trusted to do that kind of work is very, very important to me.

[01:45:29]

**GRANT**: How is it healing for you? Just to see the motors running again?

**HOFFMAN**: Yeah, just to say, 'Oh yeah we brought this back, this little tidbit like the star on the Steward this last Christmas, you know, it meant so much to so many people.

And it's nice to be able to be a part of making a lot of other people happy.

**GRANT**: To me, the Steward coming on, I may have mentioned it last time we talked, it was like a heartbeat being revived. And they're like, Butte used to have a heartbeat and it was in these hoists, you know?

**HOFFMAN**: Well, it was in the air compressors. The air compressors at the High Ore were the heartbeat of Butte. And God, you had to be here on a cold winter morning to appreciate how heartbeat was. I mean, it was just literally a thump-thump, thump-thump, thump-thump. It was incredible.

There's so much that's lost. And talking with my contemporaries that grew up in Butte in the fifties and sixties, and it was all just background. I think we might've talked about this last time. How everybody that grew up in Butte just, 'oh, this is the way it is. This is the way the world is'. No it wasn't. When they shut the mines down, people couldn't sleep for weeks because they didn't have the sound of the hoists, the crash of the ore bins, the screech of the BA and P railroad going around the curves.

Just so many of those sights and sounds - the big fans running in the background, constant hum in the background. And just the, there was a smell the ore, that sulfide ore, coming out by thousands of tons per day. You could smell it almost everywhere in Butte. It's kind of like going to Billings and smelling the refineries. There was a different smell to Butte, the smell of prosperity.

When did you come to Butte?

[01:47:28]

**GRANT**: Five years ago last week.

**HOFFMAN**: Oh really! Huh.

**GRANT**: Yeah. So here's to another five.

**HOFFMAN**: Yeah. Good luck to ya.

**GRANT**: Yeah. I've, you know, I've purchased a building in Walkerville with a friend of mine, that we're renovating.

**HOFFMAN**: Oh good.

**GRANT**: And you know, again I'm thinking about the sheer effort of just mucking out one round underground, you know? We've been laying, I've probably laid three or 4,000 brick, you know. And to me that's a big job, but I mean that amount of rock - you'd move that in like a day, it seems like.

**HOFFMAN**: Yeah, oh yeah. Then you look at the amount of brick laying that went into the stacks.

**GRANT**: Oh God.

**HOFFMAN**: You know, it boggles your mind, you know, in a day when there weren't any forklifts or trucks or, you know, everything was by hand.

**GRANT**: Well, there was a whole union just for the hods.

**HOFFMAN**: Yeah. The hod carriers union. Yeah.

[01:48:26]

**GRANT**: I would like to, you mentioned Superfund, I'd like to ask you what do you think the EPA has done for Butte?

**HOFFMAN**: EPA has been a mixed blessing for Butte. And I think a lot of it is driven by concerns that are more fear-driven than actual health-driven. Absolutely no proof of that. But if you look at the general health of people in Butte, in the days when all of things were being run by steam power, wood coal, the smelters were open smelting. There was all this smoke and yeah, there was all the illnesses. But if you really look at the fatality statistics, a lot of them were because of whatever - smallpox, cholera, blah, blah, blah. And infant mortality, infant mortality was a big deal.

But the human body has, I think, an incredible ability to adapt to adverse conditions. And if you just look at the different peoples around the world, you know, I'd have a real tough time existing in equatorial Africa. Or Siberia. And you read these accounts of, 'oh, well, where's the coldest place in the world'? 'Well, it's this town in Siberia and people live there'. 'Why do they live there'? 'I don't know'.

**GRANT**: They've adapted.

**HOFFMAN**: They've adapted. And you know, from my perspective living in New York City, especially in the slums, was way more horrible than working in the mines in Butte. Because at least in the mines of Butte, you had hope you were making money. You had a place to live that somebody else took care of some of the things, like in the boarding houses here, you know. And the slums, my wife's family came from Italy and lived in the slums in New York City. And boy, what a hopeless existence.

**GRANT**: Hm. I can't foresee, I can't see you in a city, you know?

**HOFFMAN**: No, no I'd have a tough time in the city. Not a city boy. Not a crowd boy. Yeah. I have a tough time in crowds.

[01:50:54]

**GRANT**: Superfund, I guess its mandate is to protect human health. You don't feel that it's necessarily doing that in Butte?

I think it's done a lot of good in Butte. I'm not going to minimize that role at all, but I'm looking at it overall. It's one of the funded mandates nationally that has very little oversight.

**HOFFMAN**: And a lot of things get done that are emotion driven. You might say extremist driven, in some cases. Here in Butte, I don't think that's the case very much. I give a lot of credit to Fritz Daily and the other people that have been watch dogs here. Not so much to John Ray up at Tech. But yeah, Fritz has always been science-based, he's got his emotional side. And I love Fritz to death for that. But they're just, you know, mass destruction, you know we're going to reclaim this entire slope of the Hill.

And in the process, we're going to remove all the railroad tracks. We're going to remove all the mine dumps. We're going to remove all the buildings. We're going to remove all the power lines we're going to... it's just going to be gone. And if it had been properly planned, I think there could have been a whole section of Butte basically around the Steward, Mountain Con, Original to the High Ore. Well, the High Ore's gone in the Pit, but in that general area, that could have been re preserved as an industrial heritage site.

Where you could still blow the whistles and make the ore crash into the bins and...

**GRANT**: Ride a train maybe...

**HOFFMAN**: Yeah. So, yeah, but that's kind of the history of history, that you go through these stages where  - antiques are a really good example. I was just talking to one of the dealers down here about it the other day. That something comes out, it's brand new, say a washing machine, the earliest washing machines. And then, technology takes over and better models come out and pretty soon the original one gets thrown away. So all of them get thrown away except for a few that get tucked away. And then all of a sudden bang -  they're valuable antiques.

[01:53:19]

And that's the way it is with buildings or whatever. And, you know if you look around Butte, there's this big human cry, we've got to preserve these buildings! Well, if you go from a city of almost a hundred thousand people, you've got way too many buildings at 30,000, you just can't do it.

So yeah. Things get lost. And some things get lost that probably doesn't make any difference, and things get lost that in retrospect it's a huge difference. It's a huge loss.

**GRANT**: Do you think the loss of the pumps at the Kelly was...

**HOFFMAN**: Oh, the ultimate tragedy. The ultimate tragedy. Because if ARCO had been thinking at all, if they would've been looking to the future at all, they would have realized what turning off the pumps was going to do, as the water came up into the Berkeley Pit. And when the pumps were running, all that water went into the precipitation plant and they recovered pounds of copper out of that water. I mean, pounds - every a hundred gallons of water had several pounds of copper in it that would have paid for the majority of that pumping forever. And when you factor in the actual cost that has had to be spent to maintain the Berkeley Pit and all these other things, plus the PR costs, the public relations nightmare that it created, it would have been the cheapest investment in the world to leave the pumps running. And it wouldn't have ruined the future of mining in Butte. Butte will never be mined underground with this technology that's presently in view.

**GRANT**: Can you explain why it's impossible?

**HOFFMAN**: Because all of those workings are now waterlogged and you just got this huge saturated sponge, you might say. That if you try to do new development in, would be extremely unstable, unsafe. And not to mention waterlogged. And what would you do with the water trying to pump it out because you got to pump out the whole Berkeley Pit to go underground again.

The other huge mistake was the EPA not allowing Montana Resources to backfill the Berkeley Pit, when they started up. They could have sealed off all the influx, the Berkeley pit would have been landscaped. The whole thing would have been done. And it would have cost, it would actually have saved Montana Resources, millions. It would have saved the EPA millions. It would have saved ARCO millions. But the EPA said, 'no, if you want to touch the Berkeley Pit, you take part of the perpetual responsibility'.

It was a bureaucratic decision that made no economic or practical sense at all. And I'm screaming my head off about it at the time, 'I'm saying this is stupid...'

**GRANT**: Really, at the time?

[01:56:31]

**HOFFMAN**: Oh yeah. I was clear as day, it was just so logical. Because the processing in the concentrator is done at a pH of 11, highly alkaline. You put those tailings in that water, into the Berkeley Pit, you neutralize the acid. When you neutralize the acid, all these clays dropout of solution. And become a pretty much impervious barrier on the bottom of the Pit.

**GRANT**: And that would block inflow.

**HOFFMAN**: At the very least it would have slowed it tremendously. And then when you get to a certain point you know, if you want to put in a set of pumps, and that's what they should have done with the Parrot tailings and slag down here, all this digging they did actually didn't get rid of the water problem.

It got rid of some of the contamination problem, but it's so widespread down there, the water is going to be basically unchanged. They could have done way more good just by drilling as many redundant holes as they thought necessary, pumping that water, which again is highly charged with copper, through the precipitation plant and putting it back in the pit. The water would have been insignificant in comparison to the volume of the pit.

But it would have cost nothing. Wouldn't have to move the shops. Wouldn't have blah, blah, blah, blah, blah.

**GRANT**: At the time when the EPA was making that decision about MR, were you able to, was there like a public comment period? Or were you getting on the radio? Or how did you try and communicate?

**HOFFMAN**: No, I wasn't that much of a public person then. And I was actually involved in a major project myself, so I didn't have much time to mess with it. But yeah, I was complaining to everybody I knew. I was talking to Don Peoples, and these other people, you know. And originally I was on a committee that Don formed after the shutdown, to look for ways to revitalize Butte. And I was kind of an outspoken son of a bitch and eventually wasn't invited back. So. So we all have our shortcomings.

**GRANT**: I ask a lot of people that we talk to on these oral histories about whether or not there was any protest to the expansion of the Berkeley Pit. And I've learned recently that there was some in Walkerville, with the Alice, you know.

**HOFFMAN**: Yeah. And the Alice really is an incredible story because the Alice Pit was done in the fifties.

**GRANT**: Right.

**HOFFMAN**: And if you can imagine that today, a company coming along and saying, 'oh, we're going to start this open pit right in the middle of your town, and we're going to be blasting and we're going to be hauling things, and we're going to make a lot of dust and we're going to make a lot of noise'. It wouldn't happen. It just wouldn't happen.

So you look back on that, and you think, boy, that was a pretty incredible thing. And yet Walkerville remained. the Walkerville pride remained. And there's a big hole in the middle. But it's mostly backfilled now on a big pile of rock. Used to be a great place to go park.

**GRANT**: And do what?

**HOFFMAN**: Uh, whatever.

[01:59:59]

**GRANT**: But I guess, you know, I focus on asking people about their opposition to the Pit starting. I've never really talked with people about their opposition to the Pit filling up with water. Because there was a point when they could have decided what to do.

**HOFFMAN**: And very, very, I would say almost none of the public as a whole had any idea of what was going to happen.

**GRANT**: Oh.

**HOFFMAN**: They just didn't realize. The Pit was there, it's a big hole in the ground. Yeah. Oh, well. But then when it started to fill up with water, more and more people became aware of the incredible sheer size of the thing. So, yeah, the opposition wasn't there when it needed to be.

**GRANT**: Do you feel like... go ahead...

**HOFFMAN**: And the voices weren't there.

**GRANT**: And what about right now, is the EPA doing something we should be opposing?

**HOFFMAN**: I don't think they're anything we should be opposing, I was just reading the article in the paper this morning, about they're actually going to bend to the wishes of Save our Creek group, and do more to reestablish that creek from Texas Street down to Montana.

**GRANT**: Right.

**HOFFMAN**: But, you know, one of the questions that I've always asked ever since I was a little kid and read Copper Camp, you know, was, were there ever any fish in Silver Bow Creek?

**GRANT**: Right.

**HOFFMAN**: You know, this is a huge arsenic metal laden ore body. And it's been eroded on for millions of years. And you know, I don't know, nobody can answer that question. And you know, you don't read any accounts of fishing, nothing but the placer mining, nothing but the development.

**GRANT**: Is the creek important to you?

**HOFFMAN**: Not so much. I can understand the sentiment involved for the people that were there. But the water, if the water can be treated and put back in the creek to make a creek, boy, I think that's great.

**GRANT**: Sure. Why not?

**HOFFMAN**: Yeah. Why not? So just, yeah, hindsight's a wonderful thing. You know, we can look back on any decision that was ever made and tweak it. Or say that never should have happened. So it's a lot harder looking ahead, but I think that was a lot of the Berkeley Pit thing is, nobody foresaw how big it was going to get. What it was going to be.

You know, when it first started out, it was just an experiment. Even the Anaconda Company didn't know it was going to work or not.

[02:02:38]

**GRANT**: They had a lot of overburden to get through, right?

**HOFFMAN**: They did. Yeah. And they did a couple of smaller pits just to see whether the metallurgy would be right and things like that. But yeah, they went through a lot of overburden.

**GRANT**: You know, I wonder, are the old timers that you're acquainted with in town, old miners, do they feel betrayed that the whole underground's flooded?

**HOFFMAN**: Hard to tell because most everybody's retired, but yeah, they hated to see, I think they're more missing the visible parts, the above-ground parts that led to the underground. And you know, a lot of them resent the fact that their kids and grandkids couldn't keep going with that tradition, you know, a local good paying job. And they're scattered all over the world now.

**GRANT**: I just think about all the work that went into driving those drifts and all the tools underground, all the rope men lowering all the material. And it's all just submerged.

[02:03:40]

**HOFFMAN**: Just there. Yeah. You know, when ARCO decided to turn it off, the guys couldn't even go get their personal equipment. They just said, 'you give us a list of what you had a personal equipment and we'll pay you for it. Everything is underground.

**GRANT**: It just seems criminal.

**HOFFMAN**: It does, you know, and it was a criminal act. That was a time when mining was a little slow and oil was up. And there were several instances of these oil companies saying, 'oh, we're so damn good at oil drilling, let's go into mining and make another fortune'. It was just a completely different world.

An oil well, from the time it's explored until the time it's in production, is a matter of a couple of years, usually. And mining may be decades before you see the results and they didn't have that kind of patience. And they didn't have the patience for the labor intensity of the underground operations here. Cause like I say, the Anaconda Company had more or less just kept Butte running because it was Butte.

**GRANT**: Out of some sense of loyalty, you think?

**HOFFMAN**: Yeah. Yeah, I really do. And there's a lot of people that say, 'oh, you're full of crap. Not the Anaconda Company. The Anaconda Company didn't have a heart'. But like I say, most of the upper level executives of the Anaconda company were Butte boys, right up until they hired a New York lawyer that decided he didn't need to maintain the overseas liability or property insurance for Chuqui.

**GRANT**: What was your thought on that? When Allende nationalized it?

[02:05:2]6

**HOFFMAN**: You know, if you looked at international relations at all, you could see it coming.

**GRANT**: Sure.

**HOFFMAN**: The things he did, the things he was doing, his whole very outspoken philosophy. He was going to take over the moneymaking. I mean it's the smart thing to do.

If you're gonna do stuff, you might as well have the money to do stuff. And if you don't have any moral obligation to anybody, then it's pretty easy just to say 'no, that's mine now'. It's like the bully in your neighborhood. When you were a kid. Give me your lunch money.

**GRANT**: You weren't ever bullied were ya?

**HOFFMAN**: Oh, no.

**GRANT**: Well, I just have a couple more questions and we're about at an hour, so I don't want to take too much of your time. At the world museum of mining, can you explain your, you've been involved there?

**HOFFMAN**: Yeah, from the very start.

**GRANT**: Can you tell me about that? About the history of that organization?

**HOFFMAN**: Yeah, I came to Butte in the the fall of 64, which was just after they had gotten the Orphan Girl donated to them. And they were starting their plans. They'd raised quite a bit of money and it was really that next spring that they did a lot of their work on the first exhibits. They had a lot of volunteer workers, you know, and that was the day, the heyday of the Anaconda Company and Montana Power and Stauffer Chemical.

There was just a lot of support for a mining history museum. And through the years it's really had its ups and downs, especially since mining went away. A lot of these executive people, or retired executives, didn't have the interest or the drive. And management came in that really didn't have the heart.

[02:07:22]

It was more or less a social position to be on the board of directors of the mining museum. And you know I would go away for a while on different jobs and whatnot, and come back, get back on the board again and watch from the outside. And things like the Emma hoist, you know, the last flat rope hoist in Butte, there was a group that moved it up to the museum and had all the plans to have it operating again. And then one of the spark plug guys died. And then subsequent museum quote unquote managers came along and actually scrapped out all the loose pieces for the Emma hoist.

And my big break with the museum in the 1990s was going up there and finding a whole scrap dumpster full of exhibits that were just laying around, waiting to be displayed. And I raised a protest and got nowhere and ended up taking a piece of heavy equipment over and dumping the thing out and salvaging some of the key pieces and hiding them. And then just catching hell because I was so impertinent.

It's really nice to have a group like the museum now, we've got an excellent director. We've got a good board of directors. Everybody is communicating and supportive. But my final thing with the museum, I was on the board and I had built the underground mine tour, and they decided they had a problem with the director. So they hired a new director and she took the job. And about a month later, she comes to the board and said, 'oh, there's so much backlog here, I need an assistant to help me manage the museum'. She needed an assistant because she had taken a full-time job at Montana Tech.

And the board, she was from a family here, quote unquote, and the board was - oh, well that's okay. That's okay. We can live with that. I said, 'no, we raised her salary because she was supposed to be a Razu specialist in selling the museum and she didn't tell us'. And actually it was Montana Tech that forced her to choose between the two jobs.

**GRANT**: Oh, interesting.

[02:09:51]

**HOFFMAN**: But that was really the beginning of my decline of things at the museum.

And then she was a person who was disgusted by rusty equipment.

**GRANT**: What?

**HOFFMAN**: So anyway, the ironies of life.

**GRANT**: It sounds like you've been in one way or another battling bureaucrats most of your life.

**HOFFMAN**: Yeah, you know coming from this small mine mentality thing, you know, this independent streak and got a I've got an evenly split brain. I've got the creative side and I've got the practical side and they're just right down the middle. So there's always this back and forth bouncing and how things should work. And it's taken me a lot of years to learn to control my mouth.

**GRANT**: I'm glad that you appear to be pretty comfortable here today.

**HOFFMAN**: Oh yeah. Yeah. I enjoy this. I really enjoyed - that was one thing, the carousel was good for me was getting me more social. Making contacts, interacting with people. I've actually got a brain condition called prosopagnosiawhere I can't recognize facial features.

**GRANT**: Really.

**HOFFMAN**: If I'd walk out of here, and you'd take off your hat and come down on the street, I'd have to figure out who you were all over again.

**GRANT**: Really.

**HOFFMAN**: You can't imagine how bad that disability is. And I've insulted a lot of people because I didn't recognize people I should have known.

[02:11:30]

**GRANT**: Well, it ain't going to hurt my feelings Larry.

**HOFFMAN**: Well, I've hurt a lot people's feelings and totally unintentionally. And it's a real crippling disability.

**GRANT**: Sure.

**HOFFMAN**: But because of that, social graces don't come easily.

**GRANT**: I hear ya. Well, I appreciate your time today. And before you leave, I'd like to, if we can schedule a time to go underground on a tour.

**HOFFMAN**: Oh, sure. Yeah.

**GRANT**: Would that be possible?

**HOFFMAN**: Yeah. I might wait a couple of weeks here to get a little nicer. But on the other hand, you know, I'd like to take you all the way through from the underground mine lab at Tech to the underground mine tour at the museum.

**GRANT**: Let's do it.

**HOFFMAN**: But the problem is, now our water is starting to trickle down through the rock. And just in the last week, it's really gotten a lot more muddy on the Tech side. If we do it, wear some boots.

**GRANT**: Boots. Yeah.

**HOFFMAN**: No, anytime you want.

**GRANT**: Okay, well, I'll stop this here and....well, thanks again, Larry.

**HOFFMAN**: No, it's a pleasure. It's fun to do. Always illuminating. I'll tell ya.

[END OF RECORDING]