Montana History

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Oral Report

An interview with Robin McCullough

Presented By

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Outline

Questions to be asked:

1) Could you tell me about the underground mining center?
2) Where will the center be located?
3) Could you get into more detail as to what the miners will actually be trained to do? Some of the techniques as far as blasting, shoring up, and tunnels?
4) Any other comments on the mining center?
5) Where do you see mining going today?
6) In early history of Montana, people came here, found the resources, whether it be gold or copper, and there was a great influx of people early on in the 1800s, but now, as far as Montana history is concerned, have we become a training ground based on our experience?

Actual Questions Asked

1) Could you tell me about the underground mining center?
2) And that will be through the school?
3) The location of the mining center will be?
4) Could you get into more detail as to what the miners will actually be trained to do? Some of the techniques as far as blasting, shoring up, will you be making tunnels?
5) Any other comments on that?
6) So then the goal is to provide industry with an individual at the entry level but with training?
7) Any other comments on that?
8) Another question I have for you is, a lot of mining is dependent on the prices at the time. Where do you see Butte, or the country, or on even a world scale, where do you see mining going today?
9) So, maybe on the world basis, you're saying. So is the world progressing on an equal basis, I mean, there isn't really any one country that has the corner market on production?
10) How is this applied specifically to Montana, like the Stillwater mine?
11) And typically research like that is in conjunction with industry.
12) Anything else you'd like to say about Montana Tech, enrollment, the state?
13) In summary or closing, it seems that before, in the early history of Montana, people came here, found the resources, whether it be gold or copper, or whatnot, and there was a great influx of people early on in the 1800s, but now, as far as Montana history is concerned, have we become a training ground based on our experience?

Introduction

My name is Adam Lawrence. Today is Thursday, November 21st, 2002. This is my oral presentation for Montana History. The class is being taught by James D. Harrington. I will be interviewing Robin McCullough. He is an instructor at Montana Tech.

Interview

Adam: Could you tell me about the underground mining center?

Robin: The underground mining training center was a concept that we dealt with back in 1996. The fact that there was a shortfall of trained miners in underground operations. Surface is a truck driver program, and there is a fair amount of those with each construction fob, but undergrounder is a more skilled profession. You really have to know an awful lot more. There was a tremendous shortfall, and becoming an even greater shortfall, so we applied for funds and were finally awarded the funds just about the time all the underground mining, and mining in the United States shut down. So now, I'm training people for a profession that probably will be a few years before it comes back again. By then there won't be any miners at all because of the demographics of the few coming on and the majority are forty and fifty years old, and by then we'll find that we have lost 70% of the workers for doing underground excavation. Many ask, "What do we need miners for?" Well, probably only 1% of all the ore bodies of surface is mineable and when we have exhausted all of those, or getting pretty close to it, then we are going to have to do something from an underground point of view. Many of those are a little

smaller, so it's just like cutting down all the big trees. We went through a period in the US where we logged all the great big trees, then we went to the medium size trees, and now we are down to cutting toothpicks. Well, we are doing the same thing with mining. We have mined all the big deposits, now we are looking at the medium deposits and the harder and more expensive underground deposits. We are doing it under a grant under the Department of Labor where we have to train 36 dislocated workers to be underground miners and in between that I have to rehab a facility and put in all the infrastructure, buy all the equipment, and then find these 36 people that would like to enter into a contact sport profession. It's hands on and it's hard. It's hard to find people for this job, so many of them don't want to work in the mine. So, we will be building.

Adam: And that will be through the school?

Robin: This will be managed through the School of Mines, but the students will all come through Vo-Tech. There appears to be a conflict between the Union out of the Vo-Tech and they have, for some stupid reason, the instructors have put a ceiling on their wages and therefore these people will be paid not quite twice what our instructors will be paid, not quite twice what the people out at Vo-Tech, and therefore they couldn't be part of that because they would have to belong to the Union. We couldn't pay them anymore than less than $30,000 a year and therefore those people couldn't work out there and will never get a miner for probably $50k to $90k a year and I probably won't get any qualified instructors for $20k a year. I probably won't get people to empty waste paper baskets for $20k a year.

Robin: The teachers' Union. I can understand a salary minimum, but I can't understand a salary maximum. That's how it came to be administered under the School of Mines. We will utilize it up here to give further training to our engineers. Some things are just bizarre.

Adam: The location will be?

Robin: The location will be everything from the Sendicat (sp?) pit, just above the Enselmo (sp?) mine on Excelsior to the other side of Granite Mountain. So they will be working, if you could put a diagonal line from the Granite Mountain Memorial and Sendicat pit which is just off of Excelsior, we will be operating underground 400 feet under the surface from the north. So, we're looking at 6,000 feet east-west and then probably 1,000 to 2,000 feet north-south.

Adam: Could you get into more detail as to what the miners will actually be trained to do? Some of the techniques as far as blasting, shoring up, will you be making tunnels?

Robin: The tentative plan, but we have to work it out with who ever we select as manager, the plan will be to drive grids north at 500 feet intervals off of the east-west drive that is in there now and I envision it as two grids parallel, maybe thirty feet apart so that you could run two bases. Each instructor will have six students and they will have to be in a position that they get back and forth to each other to make sure they're doing it

correctly and not getting hurt. They'll do a normal cycle, four foot steel, drilling four days a week, they'll drill out a drill pattern, plus they'll bolt up and we're going to have them do a cross-section of all the ground support methods, timber, cable bolts, split sets, mechanical bolts, anything that's used in the industry. On the idea that there's a series of tasks that each miner must master, and as soon as they've come out of the end of that, they'll put in about two hundred split sets, two hundred cable bolts, they will have a working proficiency in all the ground support techniques. They need at least two hundred hours of jackleg time. They probably don't have enough time to do that, but they'll be well onto their way, they'll find at the end of five or six weeks, they'll either be a miner or they're not going to be a miner. A jackleg without its hoses is about three hundred pounds, then you add steel on top of that, and add the hoses on top of that, it takes either a brute force of an individual, or skill in balance. And so they'll learn how to manipulate those jackleg drills and be able to collar them, and have a working proficiency when they walk out the door. They'll have a knowledge of all the different drilling patterns, and types of explosives and how to handle them, what works, what doesn't work, and of course, their safety instruction which is throughout the course, not even counting the first week, which is a focused safety training. They're going to run, at this point, track muckers, which is 40s and 50s technology, maybe some slushers. We're really more of the non-mechanized side, largely because I asked for 4.6 million and they only gave me 1.6 million, and if you want 4.6 million technology we get all the mechanized equipment, for 1.6 million, and still build the facility, you get what's available at the cheapest cost, which is about 1950s technology. I've applied for another 3 million, to bring in that other side. The long-term goal is to have half of the facility rubber-tired, and modern, and the

other half of the facility, the older techniques, so that we can provide a well-rounded education and give them a full understanding of all the different components.

Adam: So then the goal is to provide industry with an individual at the entry level but with training?

Robin: Stillwater will want to class them as a miner 3, it takes about five years to learn to be a miner. Part of this is getting to read the rock, and understanding the variabilities. I think we can provide a better qualified miner 3 than industry can because we take more time to do that. But the normal industry training is five weeks, ours is fifteen weeks. And so, at that point, if we can do it cheaper, with less turnover, then we figure in mining they go through probably three or four before they get one trained. This will be a little different program. You then take a trained miner and put him in with a skilled miner to watch him and guide him and to continue the education, and at the end of about five years, you're starting to develop enough skills that you can keep from killing yourself and be relatively effective on a day after day basis.

Adam: Any other comments on that?

Robin: No, it's a challenge, like I said, it's real easy to do these things when everybody needs miners immediately. It's a real challenge to try and figure out how to get everything coordinated at a time when everybody's trying to decide how to stay alive. There's a fair amount of opposition or a feeling of opposition from the miners

themselves, in the fact that at this particular time of lower commodity prices, there's fewer jobs, and so they're fearful of younger guys being trained to take over their jobs. The other side is, nobody's ever tried anything like this before from a school point of view. It's always been done at the mine. It's been one miner teaching another miner, or a son, or whatever. It's always been difficult for people outside the mining family to be able to get in the industry. Many times you can find disasters, such as the Sunshine fire, you'll find three generations of a family completely wiped out by that disaster-- that's how tight it was. So this gives them an opportunity for a little broader spectrum, more availability to the public in general to enter the profession. If we can provide, rather than teach them what they need for that mine, and having to wait thirty years to learn all the pieces you need, I think we'll be able to provide a broader education, a more diversified miner with a better understanding. For a phrase, a "smarter miner". I don't know if that can be done, but we're going to try.

Adam: Another question I have for you is, a lot of mining is dependent on the prices at the time. Where do you see Butte, or the country, or on even a world scale, where do you see mining going today?

Robin: The problem that we're seeing across the board, the immediate problem, is the lower commodity prices, which underground defines as a higher cost. Even in mechanized, open pit costs about $1.82 - $1.67 a ton to mine. Underground costs are someplace between $30 - $60. In open pit, you can capitalize the entire operation, and have a turnaround, typically less than 18 months. In underground, you may not see a

payback. You're going to put in probably ten, twenty times as much money initially, and not see a payback off of that for ten to fifteen years. And so, once a mine's in place, in the underground, and the infrastructure is there, it's more expensive. But it will operate rather than a five year period or seven year period, we're looking at a twenty to a possibly hundred year period. But it's still a function of the cost. Bankers don't like to be attached to those costs, or to that risk that long. They want their money back immediately. That's why there's been such a tremendous big push toward open pit. Open pit maximum depths are 750 feet, a lot of them not over 400 feet. Underground maximum depths are probably in the ten to twelve thousand, but more realistic of what we see here in the United States is in the seven to eight thousand, and there's where the economics kind of change. So we're looking at increased technology, increased volume, more productivity out of the miners in the underground, we're decreasing costs. But we're still not a at a point where its competitive with a lot of the surface techniques because of the increased financial risk, and the shorter risk period the surface operations can present. On a worldwide basis, I think that we're, like I said, there's only so many surface mineable deposits and, once those are gone, there isn't a lot left to pick from. We'll eventually see everything have to go underground. With more technology, with more equipment, we'll get higher productivity, fewer labor, which is also a problem, you get fewer and fewer people involved in it while you're making more and more tons per shift. But we're going to see that transition. Maybe not immediately, but over a period of years we'll see that transition. The original reason we went from everything that was underground was because we had no open pit technology, we had no Caterpillar until about the 30s, everything was underground up to that point. We saw as that equipment got better and

better, and it really handled things, about mid-50s, mid-60s, was really the beginning of the open pit, and it's really in its peak right now. But many of these ore bodies are just too deep for that, and so we'll have to change much of the technology, change a lot of the drilling, a lot of the development, many, many things have to change. I fear as in the timber industry and many others that we'll have to almost completely exhaust all the cheaper ore bodies and then we will slowly transition, but with that will come an increase in price because there won't be any cheap ore. In many operations you'll find that the costs of what we pay as consumers are out there because of these cheaper things. But we will see those metal prices come up because of the scarcity. If you have a mine and the price is $250 you'll have a few mines. If it's $350 you'll have a few more mines. If the price of gold is $600 an ounce, you'll have a lot more mines because each of these properties have it's own economic index, and it's what you make a profit at, the whole principle of mining is making a profit.

Adam: So, maybe on the world basis, you're saying. So is the world progressing on an equal basis, I mean, there isn't really any one country that has the corner market on production?

Robin: Not really, but the Canadians, the Scandinavians, Finland, Norway, Sweden, tremendous amount of underground technology that they've developed over the years. Plus the equipment of many of the companies from those areas represented on a worldwide basis the suppliers. More companies may get involved, at the point that there's a higher demand and more thoroughfare. But you find that areas that haven't had any

other choice have found other ways to do it and become very, very effective at it. I think we'll continue to see operations where mining has been very successful, in tropical areas, South America, there's many places in the Eastern block countries that they will continue to mine that have been mined pretty heavily but a lot of it deals with politics, labor forces. But because of the politics, the level of success is going to have to be in question. Russia has horrible unions, and terrible productivity, and they may just stop being competitive. We have to find ways to get better at it, to do it cheaper, to do it more effectively, to have a better work force, and to have better equipment, and to have better techniques. In same competition between Montana Tech and the rest of the mining schools, we have to find a way to excel at what we can to stay alive. If we're not the best of the best, we're at least fighting to be the best of the best. Then we may slide down the path that many other schools have and just close. Anybody can train somebody in English that can't be employed, but in heavy industry, you have to be top of the line to produce on a steady basis the best possible students and the best possible employees. To get the companies to come back and continue to hire your people and continue to donate money to keep it afloat if the state won't.

Adam: How is this applied specifically to Montana, like the Stillwater mine?

Robin: Our main source at this point is Stillwater, because that is the underground source up there, but we still have the Coer d'Alenes to work with, and Idaho doesn't have the mining school now. Although it's over a hundred years old, it's starting to get to that limited side, but there's …it's just a function on the international basis that we place

people all over the country, that we have to find that cutting edge, wherever we can find the cutting edge, to make our people better than anybody else's people, to be more competitive. As with industry is on that edge, our school has to be that way, too. In addition to the people, it all becomes a bigger component. This school may eventually become a research facility, at least that's my long-term target, where we create one, the miner training portion of it, creates laboratories for looking at fracture flow and water quality, and all kinds of laboratories that different professors on campus can then write grants for, so that one program offsets the cost for another program and the facility is there to allow the entire campus to do research on many different things which gives us that competitive edge that other schools don't have.

Adam: And typically research like that is in conjunction with industry.

Robin: With industry, or with the government, from Mitman's work on algae and bacteria to the work in rock mechanics. Every department has something different that they can find in these facilities. You have to carve a niche out that nobody else has looked at, that somebody needs those answers, and then you go after federal dollars and state dollars, whatever you can find to build up those programs. If nobody else has the facility to do that kind of stuff they will come here to do that work, that's how we'll do it.

Adam: Anything else you'd like to say about Montana Tech, enrollment, the state?

Robin: Montana Tech is an applied school. I went to the University of Montana, Montana State, and Montana Tech, never went to Western, my undergrad career was to visit anyplace that had beer and women, heavy on the beer. I found that in the 70s, Bozeman was an applied school, much like Tech. Now you're seeing it as a liberal arts, often the esoteric side, the engineering is downplayed, the agriculture is downplayed. We've got two liberal arts schools between Missoula and Bozeman. Missoula has a forestry school and a pharmacy school which are niches which was given to them early on and they make their future out of that. Bozeman still has the engineering and the agriculture, but not as applied as it was before, and so where Tech is hands-on, and very much applied, very much dealing very closely with the industry and industry problems. We find that even within our fields, our people are very easy to place. In cross-reference, they find that our students are from smaller communities, and they're not scared to do the work, there're willing to do the work necessary to stay alive. So our placement is very good, our success is very good, we need to see more of our students get into management roles, because then they can give more money from the corporations back to support the school. Again, trying to find niches that we can stay alive. But the bottom line is because of our high quality students, their willingness to work and do a good job, we can then stay in that same position. Being with a few students, sort of like the Marines, we don't need millions, we just need a few good people. Consequently, we produce high quality graduates, we have high-quality workers, we have an excellent reputation throughout industry, the Tech students know how to get in there and they're not scared to get dirty, and the companies come back year after year looking for more Tech students to fill their positions because of their success that they've had with our people. I hope that Tech

continues to be that side where that's the type of students our school continues to get, rather than just running bodies through and graduating them so that we can make it off the FTDs. Very few of our programs are not applied programs. Our people all come out with direct skills and can hit the ground running and be a definite additive to all the companies. Again, that's our niche, that's where we've stayed, that's where we've succeeded.

Adam: In summary or closing, it seems that before, in the early history of Montana, people came here, found the resources, whether it be gold or copper, or whatnot, and there was a great influx of people early on in the 1800s, but now, as far as Montana history is concerned, have we become a training ground based on our experience?

Robin: We were a training ground, and then we weren't a training ground, and I hope we go back to being a training ground. Butte was one of the early camps, and a tremendous resource which allowed for tremendous values, then you have the ability to pay for the education and because of those we've brought in people from Cornwall, we've brought in skilled labor, skilled mining labor from many different countries to get the job done. We've evolved out of that into the Anaconda Company having its own research facilities, developing new technologies, and then sending that technology out to different mining camps all over the United States and all over the world. Again, the ore body would allow that, the finances would allow that. Much of what Montana is was because of the Anaconda Company. Anaconda Company needed timber for support, they needed different mining properties, limestone, gypson, many things for their smelter. They

needed electricity to run their smelters and refineries. So the ore body here in Butte paid for the development of the state of Montana. Politics to make sure that we got the railroad to get our product out to the markets. Mills so that the timber could be put together and brought in. Roads and infrastructure to pay for that timber, the dams on the electricity, the mines, smelters, brickyards, everything that the company needed was what the state needed and it all filled it at the same time. Many of our people forgot that, that Butte. . . they've thought that Missoula occurred because Missoula occurred, and that Bozeman occurred because Bozeman occurred. Much of what was there, you had to have a market to sell cows. And the market was the forty, fifty thousand people that lived in Butte, every other town in the state was five to seven thousand. The railroads were there to serve products in and out of Butte, tremendous infrastructure. Pretty much everything that is in the state, with the exception of the farmers, farmers in Eastern Montana could prosper in Montana because they had railroads so they could move their products. But the railroads came to Montana because we had Butte, because we had the Coer d'Alenes. They got in on a good deal because of the demand that was there. Butte, has the ore body diminished, is it gone? No, there's roughly nine hundred million tons in the underground, but it's flooded at this point. There's still three hundred million tons that's subeconomic, but within pennies of being economic in the closed Montana Resources. There's zinc out there that hasn't been touched, there's manganese that we don't have the current demand for, we have resources here for probably easily three hundred years. It's just a function of economics. We've gone from being a high-grade, rich ore body to being a moderate, low-grade ore body. But we've still got hundreds of years of reserves. At this point, we've gone from being able to finance the entire state, to training for the entire country and the

world, to a point of just hanging on to our shorts to stay alive one more year. There's the other end, as those other opportunities are gone, Butte will eventually come back and continue to have very much a significant influence, in both the politics and economics of the northwest United States and the United States. Immediately? Probably not. But in the future? Yes. We're just too big for it to lay forever. My only fear is watching the government with the EPA, one piece at a time, bury absolutely everything we have out there to make a town so clean that people live to be hundreds of years old, check the paper, they already do that. The justification has been millions of dollars making a desert green, I have to wonder about that a great deal.

Adam: I have no other questions. I really enjoyed talking to you , I really appreciate your time. I've been talking to Robin McCullough, and this concludes our conversation.