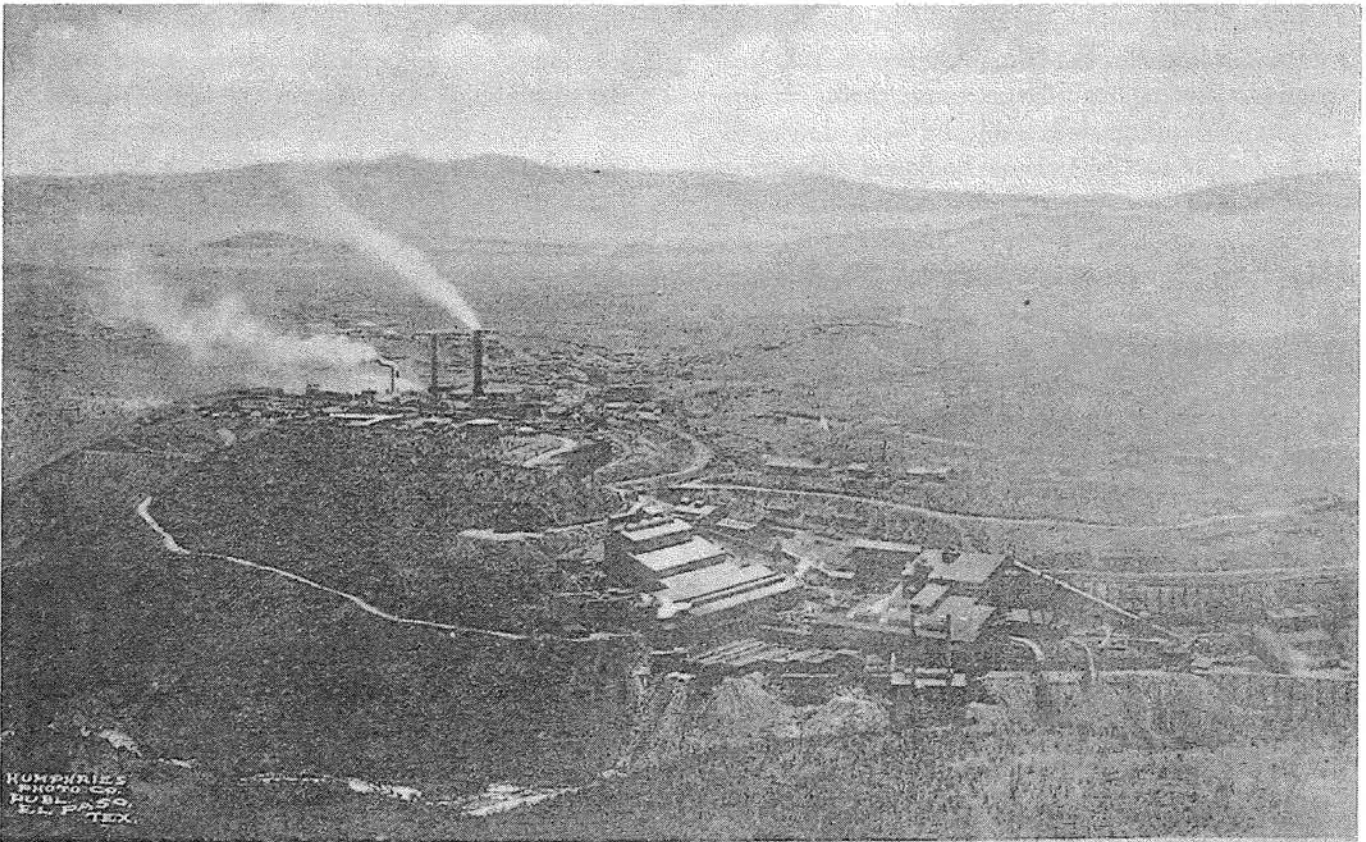


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## Reviving Cananea, Mexico: The Recollections of Geologists Vincent Perry and William Humphrey at La Colorada Mine, 1928-1975

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Comments & Editing by Eleanor Herz Swent



Cananea Smelter and Concentrator Plant, Cananea, Sonora, Mexico, c. 1930, from the Pictorial Collection, The Bancroft Library, University of California, Berkeley.

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Eleanor Herz Swent was born in Lead, South Dakota, where her father was chief metallurgist for Homestake Mining Company and where her mother was a geology teacher. She received her B.A. in English from Wellesley College, then later went on to acquire a M.A. at the University of Denver. She received a LL.D. from South Dakota School of Mines & Technology. She married Langan Swent, a long-time mining engineer until his death in 1992. She has four children and nine grandchildren. She has lived in several mining towns, including Tayoltita, Durango, Mexico; Lead, South Dakota; Grants, New Mexico; Piedmont, California. Since 1985, she has been a research interviewer and editor, Regional Oral History Office, The Bancroft Library, University of California, Berkeley and project director for the Western Mining in the Twentieth Century series

**A**ccording to the pamphlet “Cananea Past, Present, and Future,” given to visitors at the Cananea Mine, the history of the Cananea copper mining district begins with the discovery in 1760 by Jesuit missionaries. In 1899, William C. Greene, an American expatriate, acquired mining rights and established the Cananea Consolidated Copper Company. The 1906 strike at this mine was one of the sparks that ignited the Mexican revolution

of 1910. In 1917, Anaconda Company acquired the property, and in 1926 the Colorado ore deposit was discovered. The pamphlet declares, "The richness of this deposit allowed Anaconda to overcome the economic world crisis of the late twenties and early thirties, and helped modernize the mine and metallurgical installations. . . . Cananea has supplied most of the copper demanded by the Country [Mexico]. . . . Cananea . . . throughout time has continued to emerge triumphally from economic chaos and critical situations often beyond her control."

These are ringing words, but they are impersonal. A historian looks for the human element behind this "triumphal emergence from economic chaos." It was Vincent Perry, Anaconda geologist, who developed the geology of La Colorada ore body and designed it to be worked as an underground mine until it appeared to be reaching an end in 1959. Then William Humphrey planned and implemented conversion to open pit operation, so that La Colorada continues to this day to be a major producer of copper.

The oral histories of Vincent Perry and William Humphrey<sup>1</sup> are two of more than fifty volumes comprising the *Western Mining in the Twentieth Century* series produced by the Regional Oral History Office, a division of The Bancroft Library at the University of California, Berkeley. The oral history process begins with a carefully planned interview which is tape recorded. The tape is transcribed and the transcript lightly edited, carefully indexed, and bound; then it is available to libraries and researchers. Perry worked at La Colorada from 1928 to 1937; the interview with him was conducted in 1990. Humphrey worked at Cananea from 1950-1975; his interview was conducted in 1994. Excerpts from these two oral histories illustrate their use as source documents to provide personal viewpoints and recollections which supplement the written record of the contemporary mining industry.

First, let us turn to the 1990 interview with Vincent Perry, chief exploration geologist of the Anaconda Company. He is sometimes described as the geologist who "discovered" La Colorada. His oral history makes it clear that he worked with an already-known ore body, applying the most advanced geologic methods of the time for its economic development in a hospitable institutional environment. This environment, in turn, as his oral history reveals,

was determined by personalities as well as by science or technology. He recalls that he learned of La Colorada when he was a mine geologist in Butte, Montana, in 1928. Here is how he tells it: [ellipses are omitted]

One day as I was bending over my drawing board working on a map, a shadow appeared behind me. I looked up and found the boss, Reno Sales, looking over my shoulder and handing me a little sketch that showed some heavy red lines beautifully drawn on a typical note sheet. On the note sheet there were a series of very high copper assays. He said, "Vin, would you mind averaging the assays on this map and bring them in to me when you're finished?"

I averaged the assays which, as I recall, showed somewhere between 15 and 20 percent copper with added molybdenum and gold values. I brought them in to Sales, and he studied them briefly, then looked up at me and said, "Would you like to see this kind of an ore body?"

I said I would be delighted. He said, "All right. Get your things organized and you and I will start down to Mexico the day after tomorrow."

I went out that afternoon and visited the change rooms at the Mountain View and the Mountain Con Mines where I had been working, and gathered together my "digging" clothes. There was an early winter blizzard blowing across Butte Hill, and I remember the still-damp clothes began to freeze as I lugged them towards my home. When I arrived in Cananea a couple of days later and started my work there, mapping not only underground but also doing a lot of surface geology, for the next thirty days there was nothing but beautiful blue sky and warm air, and I thought Mexico was one of the most delightful spots I had ever seen.

This was La Colorada Mine, a whole new

geological world. At the time, Cananea had its own geological approach, which I thought was of a very restricted character. The man doing it had a doctor's degree in geology, but he had no background at all in engineering, had no sense of the way geology should be applied in a mining operation. After I had been in Cananea several months, [I was offered] a job as chief geologist of Cananea to organize a geological department using Butte methods. I was employed by the Cananea Company, which had become a wholly-owned subsidiary of Anaconda. There was always a very fine relationship between management at the local properties and the overall services of the geological department [at] Anaconda headquarters. It was almost as though the geologist was treated as the doctor on staff. The manager wasn't going to interfere with something that he knew little about, and he was willing to take the advice of someone specifically trained to do that kind of work.

Cananea had a large tonnage of very high-grade ore which was most economically mined by cut-and-fill and by top-slice methods. The ore body was localized within a breccia pipe, and this presented the intriguing possibility that further exploration would lead to more high-grade ore. It required using the same type of very fine detailed mapping that was practiced in Butte. It offered an opportunity to do basic research on a very unusual geological occurrence, the nature of which had not been seen or at least described in geological literature up to that time. La Colorada provided an excellent example of the relation between ore deposits and igneous rocks.

In his oral history, Perry discusses the drilling program and geology of the ore body, information published in 1933 in his seminal paper "Applied Geology at Cananea, Sonora," and expanded in the Daniel P. Jackling lecture of 1961 on "The Significance of Mineralized Breccia Pipes." Historians may want to refer to the oral history for insight into a scientific mind at work.

"Cananea Past, Present and Future" includes this

information: "During the mining of 'La Colorada,' Cananea achieved, for the first time in the world, the beneficiation of molybdenum as a by-product of a copper deposit." This matter-of-fact statement does not tell the whole story. In his oral history, Perry tells how this breakthrough actually came about:

A unique occurrence at La Colorada ore body was this rich concentration of bornite, chalcopyrite, and chalcocite, but scattered all through it were flakes of molybdenite. The bottom levels showed some high-grade molybdenite. When mining was started on La Colorada, there was no technique known about ways to separate the molybdenum from the copper.

We had information that some high-grading and stealing of gold was going on in the Cananea mill. One day Clyde Weed, the manager, called me up and said, "Have you any ideas about where that gold could be coming from? We hear reports that gold is being sold and that it's coming from the Colorada Mine. We don't have any free gold in that ore body."

And I said, "Well, are we sure we don't have any free gold?"

He said, "I don't think we do."

After shift we went out to the tailings dam and started panning the tailings. To our amazement, we found that there were strings of gold in those pans at least a finger long that showed that free gold was being produced at the mill. There was all this beautiful molybdenite coming out along with the gold. The tailings were showing that these things were being separated and being produced, but not in the orthodox way. The molybdenite was not being recovered selectively; it was being lost selectively. Cananea became a very important producer of molybdenite, and a formidable competitor in the molybdenum business. The recovery of molybdenum from copper ore has become a major source of molybdenum pro-

duction throughout the world. But the first production of molybdenum as a by-product of copper ores was at Cananea in the early thirties that developed from the attempt to track down gold high-graders at the concentrator.

Perry's oral history reveals that the first production of molybdenum as a by-product of copper ores, hailed as a scientific discovery, actually developed from the attempt to track down gold high-graders at the concentrator. It was of great benefit to the company, of course, to recover, rather than to lose, the molybdenum and gold.

First owned by Colonel William Greene, the Cananea Copper Company, a 1930s subsidiary of Anaconda Copper Company, an American company, has been Mexican-owned for several decades. Cananea is important in Mexican history as one of the cradles of revolution. Thus Perry's evaluation of social life, and the attitudes he reveals, recalled some sixty years later, have significance for the historian.

When asked in 1990, "What difference did it make to be operating in Mexico?"

Vincent Perry answered:

I didn't feel that it made a great deal of difference. We didn't have to really learn Spanish, except miner's Spanish. I could speak and understand the Spanish that was used underground. Anaconda maintained active political contacts in Mexico City. Locally there were general good relations between the Mexican and American communities. My wife, Margaret, was selected by a group of Cananea businessmen—all Mexicans—and honored at a dinner given by them in which she was formally crowned "Queen of Cananea." From a professional engineering viewpoint we were more in touch with the United States than with Mexico; we would attend AIME [American Institute of Mining Engineers] meetings in Bisbee or Tucson. We felt that we were part of the Southwest mining group, regardless of the position of the international line.

We had good company housing, a nice house about five minutes from the number

one tee on the golf course. So that to forget work and relax, it was always possible, after four or five in the afternoon, to go down and play a round of golf. We had a very competent *criada* who helped out with the housework. Like a typical foreign mining camp, there was a lot of social activity going on among our many friends, and we had fine picnics, parties, and get-togethers on weekends.

He praised the medical care, provided by an American staff:

We had an excellent hospital headed by Dr. Frank Hogeland, a graduate of the University of Pennsylvania. We had American nurses at the hospital. At that time my wife had not resided in Cananea very long and we didn't appreciate the fact that there were excellent medical facilities there; the baby was born in Arizona. However, in retrospect, I can say that the quality of medical attention we received at Inspiration was no better and probably less than we would have received at Cananea. But that was a mistake which we made because of ignorance. We equated medicine in Mexico with something foreign and of questionable quality. We would have been better off if we had stayed at Cananea and had our baby there. [There were medical difficulties with the birth]

Asked about drinking in the mining camps, Perry replied:

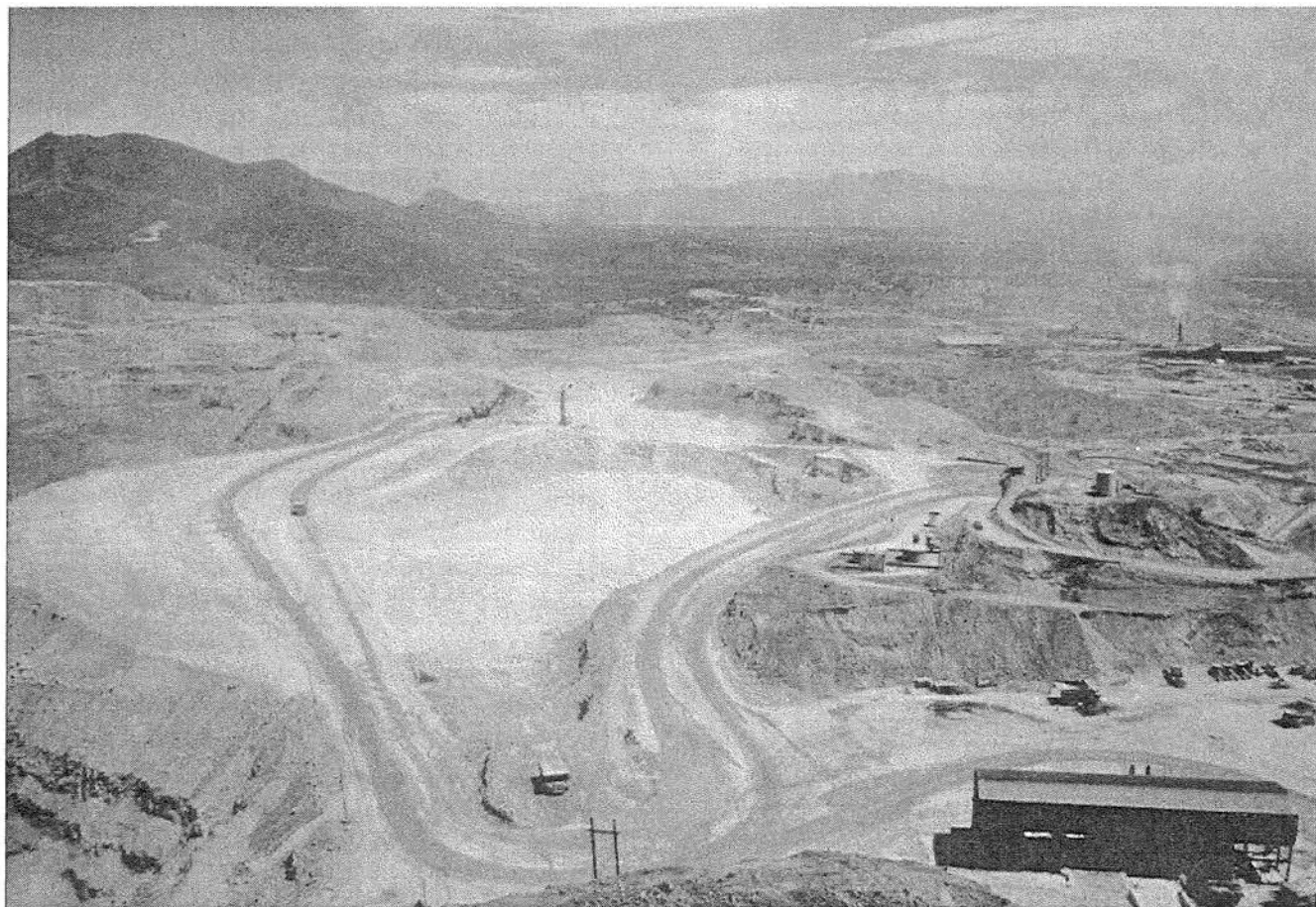
We went when Prohibition was creating all kinds of problems in the United States and there were all sorts of abuses that stemmed directly from the Volstead Act. At Cananea [we drank] some "bathtub gin," although liquor was smuggled in from the United States and was also available from Mexico City. I was in Cananea some time before I had a drink. I remember the first real party [and] at the time, I was surprised to find evidence of heavy drinking on the part of people that I didn't think took a drink. [laughs] Maybe the reason was that they weren't used to drinking.

An important part of the Perrys' experience in Mexico was Catholicism. Asked about this, Perry said:

When we first went there, the Catholic church was banned in Mexico. Informal services were conducted by the widow of Colonel Greene. She lived there in the home that they had built in the early days, and she was a devout Catholic. She tried to conduct a prayer service every Sunday, and we would attend that. The Protestant community was served, again, by local people. Our daughter attended Sunday school in the Methodist church. About the time we left, the Catholic church was recognized in Mexico, and the old cathe-

dral at Cananea was renovated. When I made periodic trips back to Cananea, it was revealing to see the devotion of the Mexicans. As a matter of fact, during my last visit to Cananea in 1989, I was really surprised to attend a mass that was so crowded it was difficult to get in the church. The congregation was all Mexican, and the religious fervor of the community was as strong after the long suppression following the Mexican Revolution as it had been before.

Now let us turn to the oral history of William Humphrey, born in Chile in 1927, the year before Vincent Perry went to Cananea. Humphrey's father was mill superintendent at Anaconda's Potrerillos



La Colorado Mine, Cananea, Sonora, Mexico, 1998. Photo courtesy of James Fell.

mine, so he knew both mining and Spanish for the first ten years of his life. After American schooling and military service, he was hired by Perry as a young geologist. His oral history reveals changes not only in mining technology, which are documented in written records, but in social attitudes. These insights are the best kind of information that can be culled from oral histories. Here is his recollection of his hiring:

[Vincent Perry and Alex McDonald] said I could come down to see them at the Pioneer Hotel in Tucson. I got my best duds on, and I was nervous. Vin asked me about what I'd been doing, and what I'd like to do. He said, "Why do you think you want to work in mining? And why us?"

I said, "Well, in the first place, I need a job because I've got to support my family. In the second place, I think mining is very romantic."

This old crusty guy [McDonald] looked at me and he said, "Kid, that romance can get to be a big pain in the ass after a while."

Humphrey gave a candid view of the social climate at Cananea in 1950:

There was some antagonism between the Mexicans and the American staff. The town was about 20,000, and we employed [about] 2,400. There were about 500 Americans. It was a hard time for foreigners. There was some animosity. The manager never became proficient in the language, which was a drawback. But he was there for the first ten years, at least, that we were there, and was very good politically and did a lot to keep the pot from boiling over, so to speak.

The American doctor, praised by Perry, did not impress Humphrey:

Eventually, the American doctor retired and left and his assistant, who was a Mexican, took over. Very good doctor, very smart. In fact, I transferred over to him before the

American doctor left because the old doctor was a tough old codger that had been down there during the last American invasion. He was an old army doctor. Tough old guy, and didn't have very much of a bedside manner [but] it was good care.

When asked about social drinking at Cananea, Humphrey answered:

There were some pretty wild times. When you're in an isolated spot like that, and you make your own fun, a lot of people think the fun is to be drinking a lot.

When asked, "Were you ever given any overt guidance in personnel relations or international relations?" He replied:

Not to start with, but [in the 1960s] the manager and assistant manager were sent to charm school in New York. Part of that was how to act in a foreign country, what your obligations were, and what the issues were. The staff when I first went there was all American—well, there were some English there. In the foreman areas, there were some Swedes, and I guess some other European people. The chief geologist was a Mexican, but not the operators. The operators were all Americans. Gradually, of course, that changed over the years, so that eventually they were all Mexican staff. I was at the turning point. It was a very interesting time.

One of the major changes has been in environmental concerns. Asked about air pollution, Perry, reflecting on a half century earlier, said:

There was no concern about that. One day the fumes of sulfur dioxide were settling so thick over the office that you could hardly see across the road. I thought, This is terrible stuff to be breathing. I said to [the smelter superintendent], "That was terrible, the smoke up there at the plant. I can't understand how you put up with it."

He said, "Vin, don't you know that sulfur is good for the blood?"

It certainly didn't affect me from a health standpoint, and the people in Cananea didn't seem to suffer from the smelter smoke. There was enough wind on those broad plains so the smelter smoke drifted off and was dissipated.

Perry was eighty-seven years old at the time of this interview, and in excellent health; he died in 1997 at the age of ninety-six; Humphrey in 1999 is seventy-one years of age .

Humphrey recalled that in the late 1960s, the environmental movement began to have an impact on mining:

Then we became concerned with recovering the sulfur from the smelter, because we were just letting it go up the stack. The tailings from the precipitation plant were put over in an old concentrator tailings dump, which was the head waters of the San Pedro River, which ran all the way down to Arizona and joined the Gila River at a place called Winkleman, Arizona, near Hayden. The Salt River came down and joined that, and then formed the Gila, which came on out. So every time we had a big rainstorm in the summer and washed some of that iron sulfate out of the tailings dam, where we just deposited it, it would wash it all the way down to Arizona. We started getting a lot of static about contaminating the San Pedro drainage. I think somebody in the Arizona State Department contacted us, when they traced it back to us. So we became very concerned about all of that, and tried to build our dam up to prevent that happening.

When asked if there were health hazards for the workers, Humphrey replied:

Not that we could tell. We had good records on all of our workmen, and we had a good hospital. We had good health controls. Gosh, that smoke got pretty thick sometimes around the smelter, and that wasn't too far

from the hospital or some of the houses. Sure, it damaged the vegetation right around that area, so you couldn't grow much. But I don't think there were ever any serious health effects from it. I suppose they've done something about it now, but we hadn't up until the time I left. We had put some sprays in the discharge before it got to the stacks, to knock down some of that sulfurous acid.

One of Humphrey's most important contributions to Cananea was the redesign of the mine in 1959 after predictions that its ores were exhausted. He said:

What I did was I got some huge pieces of paper, maybe six feet long and six feet wide, and got a big table to put them on, and got all the maps that I could of the whole operation, the underground and the surface, and made a series of level maps 100 feet between levels, just patched them together with tape, and tried to get the same scale, so I could see what we had all together over this large area. Apparently nobody had ever done this before. So then I got all these things piled up, and I started at the very bottom one. I took a pit up at 45 degrees that took the whole country in, and it looked viable. It looked like there was enough ore to sustain a pretty good stripping ratio. I'll tell you, when I first looked at that, it was almost like being drunk. I was just so happy.

The oral history tells of the human concerns that accompanied the change in technology:

Then the big thing was to convince the management that this was the thing to do, to shut down the underground mine and go to completely open pit. The big problem was, what do you do with all these 700 men that were underground? Do you just fire them all? You can't do that in Mexico. What we did was offer an early retirement or a transfer to the surface somewhere. So we had a lot of negotiations with the union to try to convince them that that was the best thing for all of us.

Then we set up training programs, which I had a lot to do with, with drill operations and truck operations and shovel, and then we had regular tests that they had to take to pass muster to be an operator, both from a technical standpoint and a safety standpoint. Then they got a diploma and a belt buckle and all of the stuff that goes with it. We reduced our labor force, where at one time we'd had something like 1,700 people total, and I think we got that down to right around 1,000. But that took many years to do. We found we could take underground miners and bring them out and make pretty good pit miners out of them. You can't do it the other way around; you take a guy from open pit, you can't make an underground man out of him. It's just a different kind of a life. The end result was that we had a program that we knew would last about twenty years. And of course, that was in

1965, so that twenty years has long passed.

Humphrey left Cananea in 1975, nearly fifty years after Perry went there; La Colorada still supplies most of Mexico's copper. After a stoppage in 1989, the company was acquired by Grupo Mexico and the name was changed to Mexicana de Cananea. They are now considering an increased production of over 200,000 tons of copper per year, and they have a stated philosophy "that mining should be done in an efficient way and in harmony with the environment."

The Perry and Humphrey interviews document changes in geological and mining methods and technology, labor relations, and social attitudes at one of Mexico's most important mines. Even though oral histories cannot go back past the memory of a living person, comparing two oral histories with men of different generations can provide information of value to historians.

## Notes

Eleanor Swent, Senior Editor *Western Mining in the Twentieth Century* series Regional Oral History Office The Bancroft Library, University of California, Berkeley.

1. William Humphrey, *Mining Operations and Engineering Executive for Anaconda, Newmont, Homestake, 1950 to*

*1995*, Regional Oral History Office, The Bancroft Library, University of California, Berkeley, 1996; Vincent D. Perry, *A Half Century as Mining and Exploration Geologist with the Anaconda Company*, Regional Oral History Office, The Bancroft Library, University of California, Berkeley, 1991.