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Salvador Treviño

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Mining in Mexico
Oral History Project

Salvador F. Treviño
By W. Noel McAnulty, Jr.

March 5, 6, June 19, 1996

M: Today is Tuesday, March 5, [1996]. I'm in Mexico City at the office of Salvador Treviño. I'm going to visit with Mr. Treviño about his experiences of mining in Mexico. Sal, thanks very much for your time. Could we just start by you telling us something about after you left the university, your first jobs in Mexico?

T: Well, after graduation I got my master's degree at a little mine in Colorado by the name of Wagon Wheel Gap. It was a little mine where we really learned what it meant to fill a car with a shovel, how to tram it, and we had a hell of an eight-hour shift. We used to get paid six dollars and forty-eight cents a day for a day we worked, not for a calendar day. On the Fourth of July we didn't work, but we didn't get paid.

M: When you got out of school, then, you went to work basically as a miner?

T: That's right.

M: Not as an engineer?

T: No, no, no. Remember, this was pretty much the end of the Depression.

M: What year was it?

T: This was [19]41.

M: 1941.

T: I had already had a little experience working in Real de Monte in Pachuca here making a hell of a salary, a hundred dollars a month as a student trainee, which was very good, but that was really my first working experience in Wagon Wheel. Well, it was very important in my professional life to have known what it meant to do a hard day's work and get paid for it because in the years that followed I could appreciate somebody else's hard labor and was more considerate than others that hadn't done it themselves.

From Wagon Wheel I went to work at Sunrise, Wyoming with the same company, Colorado Fuel and Iron. In both of these mines the only person that knew that I could read and write was the superintendent of the unit because, obviously, I would not be very well accepted by my colleagues if they knew that I could read and write.

M: So most of the miners at the time were illiterate?

T: They were very, very backward. Of course, we were up in the end of nowhere at Colorado. I could live with anything, any hardship that they could send, except that I could not go to bed in my sweaty long johns that I had worked all day with. I just had to take them off and put pajamas on and sleep between sheets. I just could not do without that. It made quite a fuss. That was the first, the biggest sign that I was not exactly one of the boys. They were tough men, hard

workers, strong back, and a weak mind, so I did have an advantage.

M: So what were you mining at Sunrise?

T: At Sunrise it was an iron mine. (points to photograph) There it is right there.

M: Was it an underground mine?

T: Yeah, it was a big, underground mine, block caving there, and it was a union camp. It was a long shot from Wagon Wheel Gap. In Wagon Wheel Gap you were liquidated every Saturday and the shift boss or the jigger boss would choose his people, his workers, on Monday morning from the previous group or the ones rustling a job. Remember, this was still the Depression, so there were people hoping for a job. So you were competing on that. And, of course, Sunrise was a unit far from that, but it was a hell of a nice experience because I started there as a locomotive operator and eventually got to be a contractor, which was a considerable increase in pay. Instead of six forty-eight we would be making close to nine dollars as contractors.

And I never will forget the name of an engineer that made a mistake. Myself and my two partners, we made nearly thirty dollars a day for one month because this good engineer had made a mistake. It was an absolute mistake; nobody made thirty dollars a day, not even the manager.

M: Well, was it a mistake he made in the contract that he wrote or in the calculations?

T: No, no. He made a mistake in separating the parts of the contract. In other words, we were driving a heading. We were driving a heading, the three of us, and it was a mechanized operation in those days. Now, "mechanized" is with a question mark today. And we had to timber. We had to timber it. And this good engineer by the name of Wheeler, I never will forget his name, made it. Another crew that was driving a parallel heading had broken up, so he gave us the part that had not been done, mostly the timbering part, and he split up the cost of the price. And that's where he made a mistake because we timbered it in about three or four times as fast as he thought that it could be done. One little detail: we were driving, developing a new block caving body. It was something planned not by the engineering- scarce engineering people in the mine- but by some big shots in Pueblo, Colorado. [Main office for CF&I].

So the mine superintendent could not read a map. He would get a set of maps from the main office every month and he just couldn't make heads or tails out of these maps. I had plenty of time at night, so I drew an isometric drawing of the block of what we were doing because I could see his maps. I happened to show him my isometric drawing of this block, how it was going to be, and what was already done. It was an easy matter. When he looked at that he saw what he was doing. He knew. He could read that. Incredible! He thought I was the smartest man in captivity. He thought I had invented it,

(laughter) imagine. So I had the surprise that the next morning that I went to work. He said, "Young man, I've got news for you. I've got a locker for you"- because we used to have a basket with chains to put our clothes up to the roof, so the smell was all up there and not down in the old change houses.

M: Sure.

T: He said, "I've got a locker for you." So he actually gave me a locker with the bosses. There were very few shift bosses. Anyway, it was a good start. The manager knew that I could read and write because he had gotten a letter from the main office telling him that I had worked some mine at Wagon Wheel Gap and was being transferred to Wyoming.

Well, the manager had an embolus on one leg. He was an old man of about forty or forty-five in those days. (chuckles) That is an old man in my perspective and...

M: Or was at the time?

T: That's right. And so he had an embolus on this leg and he called me in and he said, "For the next two or three months you are going to be my legs and eyes." Then I said, "Look, it won't be that long because my year of internship will be on such a day. And I will work here in the States one year to learn the business and I'm going back to Mexico." And I said, "So I'll work for that with one condition: that you give me the same pay that I've been earning as a contractor." And he said, "Oh, no problem." So that was a hell of a promotion.

I was already dressing with the bosses in the change room. That was important.

M: So what kind of work then did you do?

T: All I had to do was carry a little lamp, which was no work compared to what I had been doing, and just walk around all day in the mine. That was no work at all. It was vacation, logically, just looking at what others were doing. But he called me two or three days after having given me this job and he said, "Man, I can't pay you that kind of money that you made." It's when Wheeler had made the mistake. He said, "Forget it." I said, "Well, we can negotiate." So we did negotiate a reasonable figure because he couldn't pay me that amount of money. He wasn't making that kind of money; nobody was making that kind of money. Thirty dollars a day, that would have made a thousand dollars a month. That was impossible. Nobody made that. Maybe somebody in Washington (chuckles) was making a thousand dollars. No one we knew was making that kind of money.

And so, eventually, my time was up; my year to the day except for one day. There was a superstition in camp that no one should work the last day because the last day he would have an accident, so I did not go to work my last day to complete the one year of internship. And so he gave me a letter, which had a lot to do with my career in the future. That leads me to going back to Texas College of Mines.

Well, from Wyoming I wrote a number of letters to mining

companies in Mexico and got only one answer from AS&R, ASARCO Mexicana. They offered me a job in San Pedro Mines in San Luis Potosí with a salary of a hundred and twenty-five dollars a month. That wasn't too bad. It was not a bad salary in those days, but I say in the operating field I would have refused any other opportunity for work because of my year of training. I thought I had learned what a day's work in the mine was and I wanted to be a miner and not so much an engineer.

So I went to Texas College of Mines with dollars sticking out of all my pockets. I probably had five hundred dollars in cash- of course, in those days no credit cards or anything else- just dollars sticking out of all my pockets. And I went back to school, went to see [John W.] "Cap" Kidd. I said, "Cap, I still owe you some money." I didn't owe him some money. I owed the number of funds that helped us all study in those days. Nobody in school had any money, so we all lived from whatever work we could do and, not only that, we borrowed from a number of programs that Cap Kidd managed, so I owed a few dollars. And I told Cap, "Well, add them all up, Cap, and I'll pay them off." And he said, "In how many years?" And I said, "No, right now!" (chuckles) "You mean you can pay them off right off the bat like that?" "Yeah, I sure can." I probably had five hundred dollars. I probably owed a hundred dollars or a hundred and fifty, something like that. In those days we used to live with twenty dollars a month, so

(chuckles) it was a lot of money.

Now, I went to see Prof Graham, our metallurgy teacher. He was a tough guy, but he could appreciate a young man's efforts. He was very human about that. So I sat there in his office and under the glass, like this, (demonstrates positioning of letter) he had a letter of recommendation from when he was a very young man from one of his bosses. And I just happened to tell him, fortunately, I said, "Look, I got a better one." He said, "Aw, it can't be better than that." I said, "I'll bring it to you." So the next day I took it to him. He read it, the letter of recommendation from my old boss at Sunrise, the one with the problem in his leg, and he said, "My God, you don't have to work for AS&R. Can you stay a few days? I'll get you a better job." I said, "I can wait months if necessary." I had all that money in my pockets. It was practically a fortune. (chuckles) And he said, "Okay, I'll get you a better job."

Meanwhile, I walked up to my friends that hadn't graduated. They were getting ready to graduate. This was in June of the next year after my graduation. So I came up to my old buddies and roommates at the basement of the gym where the three of us had bunked, had lived. And Primo Miller and Kiki Escudero, the two of them were graduating, and they were talking about the fact that they didn't have the money to buy their graduating rings. (housekeeper enters room) Here's your coffee. Can you shut it down? (taping stopped and

started again) If I remember right, the rings were worth eleven dollars each and they were going to do without them because they didn't have that kind of big money. And I said, "Don't you remember who paid for my ring?" They said, "No, we don't remember." I said, "Both of you." Because, especially Primo, had gone to work a week before my graduation and he had gotten paid and he sent me six dollars for my ring and Kiki had chipped in with six dollars. So I said, "Now, I pay for your rings." And they said, "You better. That's interest on all that money." So that's how they got their rings.

Anyway, a couple of days later Prof Graham sent for me and he said, "You've got a job with the antimony company at Wadley in San Luis Potosí." And he said, "You'll be making a hundred and eighty-five dollars a month and you're going to be in charge of an exploration in Chihuahua." Well, that sounded great.

M: So what was the name of the company at Wadley?

T: It was the Refinadora...

M: Refinadora?

T: Compañía Refinadora Mexicana, S.A. That was a great step in my career because it kept me out of the ranks of those that had to work in the bigger companies and slow promotions, slow learning, and with a kind of soft living, but that's not what at my age I was looking for. I was looking for learning the business at any cost.

M: So did you go to work and live in Wadley?

T: No. Well, Wadley was headquarters. That was the headquarters. Those were the big shots. Remember, I was the newcomer there, a young fellow. A Texas Miner by the name of Stover, Cleave Stover, was the boss, the general manager of the company. That's how Graham, who had been his professor, had gotten me this job.

I came through Mexico. By that time my family was back in Mexico. And I came to see my family for a few days and then reported to Wadley with Stover. Stover sent me up to the mine, the Wadley mine, up in the mountains, because the offices were in the Wadley Railroad Station. That's where the big shots lived, but the mine was up in the mountains.

M: This is Sierra de Catorce?

T: Up on top of Sierra de Catorce practically, a little less than ten thousand feet high. Ten thousand feet high was nothing that scared me because Wagon Wheel Gap had been at ten thousand feet high but in Colorado, which made a little better climate than in Wadley, but not too much better. It was damn cold.

Well, I got there, reported to a man, a Texas Miner, that was the mining superintendent that was to be a very important friend throughout a lifetime, Vicente Cisneros, who was the mine superintendent. He was supposed to train me about what antimony was all about.

M: And how much older was Cisneros than you, Sal?

T: He was about five years older, but he had been a legend at

Texas Mines when I got there because five years, of course, made a lot of difference, so I had never met the man. So I stayed up with him about, I don't know, two or three, maybe four weeks, finding out what antimony was all about. Unique mining situation and a very old mine, very large mine, very little production, but valuable production, and it was really a geological job. Structural geology...you had to work with that more than with other problems.

I went there only for a few weeks because I was supposed to go to the sierras in Chihuahua to head an exploration project up in the mountains, Las Virginias. Las Virginias was the name of the claim. We worked up there. That was a very, very, happy opportunity or happy year that I spent on those mountains even though it was an unsuccessful exploration.

M: Were you looking for antimony in the sierras?

T: Yes, we were. We were working on two antimony prospects. And, as usual, you know, we would get excited about a little find and then get sad about not finding more and...the usual story with antimony.

Anyway, I had a very happy experience because, of course, I was born in Chihuahua. And it was a life out in the open; I lived in a camp, in tents. And it was cold in the sierras and those canvas tents weren't very warm, but otherwise it was a very happy situation. I enjoyed it enormously...being out in the open with all this ranching community. I made friends with all the ranchers all around. And there I had my first

experience with reality. The whole camp was held up one night. I was the only guy that owned a vehicle. It was a pickup. It was a nice, new pickup that could drive to [Hidalgo de] Parral, [Chihuahua] within six hours...not in the rainy season. In the dry season you could make it in six hours. In the rainy season you went on a horse.

Well, that morning some ranchers brought a wounded young fellow that had had an accident on a horse and he needed to be taken to Parral, so I decided to do a good deed and drive him. My job wasn't all that important, so I could drive this wounded young man to Parral. So I drove him to Parral and then drove back the same day. The fellows that were to hold up the camp, they thought I had gone to get the payroll, but I hadn't. I just...

End of Tape One

Side A

Beginning of Tape One

Side B

T: They woke me up with a pistol and flashlight and, I'll tell you, the hole in the cannon of the pistol looked like it was two inches in diameter, but they were very nice. They were very nice..."Señor Ingeniero." They treated me very nicely,

but they did tie me to the post. And after awhile they brought the bookkeeper and his wife and tied the three of us to the same post, but his wife was in her undergarments. (chuckles)

The end result was that they didn't take much, a few hundred pesos that we had, but they did take my pistol, flashlight, and a few other things: my Brunton compass, just a few things. What else could, you know...a little exploration camp. But, anyway, the end result was that we got it all back with interest because I inherited the horse from the head man that didn't need a horse anymore after we caught up with him. (chuckles) So that was quite an experience.

M: So how much longer did you work for Refinadora?

T: I worked for Refinadora for about five years, but this was the beginning. Eventually, the bosses decided that it was enough exploration in that area and so that was it. I got instructions to load my pickup with the most valuable things that I had in camp, give everything else away, which I did, to all my people.

And one interesting story. Nobody wanted the horse. It was a beautiful horse, but nobody wanted the horse because they said that in an area of great respect between armed men they didn't want to ride around on a horse that had belonged to somebody else. And I told them, "I don't see that that's any argument because I've been riding around these hills six months on it." "Yeah, but that's you." That's just a little

story there.

So I got instructions to load up and to report to Wadley. That's easy to say today, but in those days coming out of the mountains in Chihuahua and drive to San Luis Potosí over no roads...it was quite a feat, but I did get there and turned in all the things. I was given three days to render all my bookkeeping in the office to settle that exploration and was sent to the second most important mine as the unit superintendent in Soyotal in Querétaro in the Sierra Gorda, Querétaro. That was quite a promotion.

M: As superintendent of the mine?

T: No, the unit superintendent.

M: Okay.

T: And that was quite a promotion, but I was still getting a hundred and eighty-five dollars a month, which was a lot of money. In Parral I didn't only have the exploration of these prospects, I had the purchase of antimony in the whole area, which kept me traveling in the area and with all expenses paid, all expenses paid at the camp. A hundred and eighty-five dollars was... . I don't suppose I spent twenty-five of those, so it was a lot of money in the bank in those days.

And one interesting comment we can make. From the time I got to Wagon Wheel Gap, well, let's say to the first Saturday at Wagon Wheel Gap, I never again ever had an economic problem in my life. I never had any need. I had had enough of them before, but after the first Saturday in Wagon

Wheel Gap I never again had any problem. Those hundred and eighty-five dollars with the Refinadora was a lot of money. I got there and it was a hell of a camp.

M: It must have been really difficult to get to Soyotal in those days, wasn't it?

T: It was what?

M: Difficult to get to Soyotal. How did you get there?

T: Driving.

M: Uh-huh. But up from Querétaro that road couldn't have been very good.

T: To Soyotal?

M: Uh-huh.

T: It was not finished. The company had been driving the road, but it was not quite finished. I finished it. I finished it up to one side of the mine. And the camp was on the other side. The topography didn't allow for a lot of... . So men, women, children, burros, and everybody had to go through the mine to get to camp from where the trucks ended up. Remember, this was war time by then and everything was scarce. Forget the spare parts, tires; everything was scarce. Everything required priorities from Washington but, also, remember, antimony was a valuable commodity we were mining. A little later on I'll tell you about my first trip to Washington to guarantee the antimony production. I was getting to be important, but that's a little ahead.

I got to this camp where things were very, very...

(taping stopped and started again) The trouble with that camp was that we were making quite a bit of money. It was a very, very, successful operation, actually...a very [good] wartime price for antimony.

It was a very prosperous camp, but very limited facilities because of no water. After we finished the road to one side of the mine the trucks would bring water to us, the metal trucks that went all the way to the mill in Peña Blanca, and would bring back water for us in oil cans, oil drums. Now, that's alright when there's very few of you, but then we were a few hundred people there in the middle of the week and no water. It was hard water, not good for drinking and not good for cooking. The drinking water would be brought to us on burros from eleven kilometers of mountain roads, so you can imagine what the scarcity of water meant. On Thursdays we would shut down the offices, the warehouse, the shops, and all go down to the river to take a bath even if we did not need it. Well, taking a bath once a week wasn't new to me because at Wagon Wheel Gap I went to see the superintendent and said, "Could we manage to warm up the waters, also, on Wednesdays so we can take a bath twice a week?" And he said, "If you can find another guy that wants to take two baths a week with you then I'll approve it." These other guys never took a Wednesday bath, but I did. But I had to shovel the coal to warm up the water, prepare everything to take two baths a week, so Thursday wasn't too bad. But we were doing fine.

And, you know, it's incredible how you can live happily, peacefully, in a community of lack of everything that we consider necessary today. We were running out of parts. Our compressors were pretty much out of working [condition]. The power plant was down. We used to light up with our Coleman lamps. And I had a great big Zenith radio with three big batteries that we knew were not replaceable until the end of the war, so at eight o'clock at night in my office I would turn on this radio to hear the war news and everybody in camp would come to hear those fifteen minutes. At fifteen minutes I'd turn it off because we didn't know how long the war would last and we hoped the batteries would last as long as the war.

Well, I was lucky as usual as it turned out to be that I would be in the mines in the mining business. And one day Enrique Prado Ruiz, the brightest student ever graduated from Texas Mines- his degree was delivered to him personally by the president of the college, the first time that the dean of the engineers did not give it because he had been such an exceptional student. He was my mill superintendent in that camp, not in that camp, but down by the river where the mill was. So I got this telegram from, by that time my friend, Stover saying: "YOU WILL REPORT AS UNIT SUPERINTENDENT OF THE WADLEY MINE. TURN OVER YOUR RESPONSIBILITIES TO ENRIQUE PRADO RUIZ." I called him up to the mine and said, "Well, you got yourself a job. All the calculus, all the differential equations that you were a star at, won't do you one bit of

good to manage this five hundred Indians on the top of this mountain." But he took over the job and I reported to Wadley as the unit superintendent. By that time, of course, I was about ready to be married.

M: And what year would this have been, Sal?

T: This must have been 1942, towards the end of 1942. The war was going on good. And I had long known who my wife was going to be because of family relations and sporadic visits to Mexico City. Lolita Claywell was her name. She was a friend of my sister's, so it was all pretty well settled. We had been courting for more than four years by then and most of it by mail because I had been roaming all over the world. Our world in those days, it was quite limited.

And so I had started a house because I planned to marry. I planned to marry, so I started a house, to take her to this camp at Soyotal. The house was half-built when I got this telegram to report to Wadley, so that was the end of that, but it would have been a wonderful opportunity, wonderful training, for a city-bred girl that had been bred with a silver spoon in her mouth. It would have been a wonderful few months in that very primitive camp, but it wasn't to be, evidently. When we did get married at the end of the next year she went to her first house when she went to the superintendent's house, which was a very different camp.

M: In Wadley?

T: Yeah. It was a very different camp. But, anyway, I got to

Wadley and Vicente Cisneros, who was turning over his job to me because he had been there for a number of years, for whatever reason, he had resigned. As it turned out it was a very nice relationship. Again, I was with him for a few weeks before he left and I took over. It was a big mine to learn. It was an entirely new ball game. We had a very tough responsibility to feed the Laredo Smelter that provided most of the antimony for the war effort. There was some antimony coming from Idaho, but the Laredo Smelter that smelted Mexican ores was a very important thing.

It didn't take long for me to be lucky again since it was such a big mine and I didn't have time to learn all the geological situations of finding the ore. Antimony...the problem was finding the ore, not mining it, and so it was a hell of a structural geology opportunity. As it was I was lucky. I kept all of Vicente's exploration faces. And one of them was in a *bonanza* within three months of my arrival and another one, maybe three months later, so I had two of them. I could have provided the five hundred tons of metallic antimony from the smelter alone, that is, with that one mine, but the company had other mines that had to be pampered. And our clients... . Remember, this was an old company that had been mining antimony for many, many years- at that time, for sixty years- so we had to take care of the clients who had little mines all over the country that was selling the stuff to us. So I was limited in my production because the Laredo

Smelter was limited to five hundred tons a month. So my job was to produce.

I had a boss by the name of Jerome Hilbert, who was an old American miner, but very much Mexicanized; he knew the country better than most of us and he was a wise old man. He gave me many, many good advices that I have passed on to my mining descendants, all the young men that I have had the privilege to train. I've passed on many of his... . I'm happy to report that the lower level of the old mine, I started it and gave it its name, San Gerónimo; he was Jerome. As it turned out he died and I was promoted to his position, which was the second dog in the company.

M: Still there at Wadley or in Laredo?

T: No, in Wadley.

M: In Wadley.

T: The same company owned the Laredo Smelter and this company, our Refinadora, and other companies. But Stover was the manager of this thing, so I was promoted to the second dog in charge of purchasing of antimonies and of all the units in the company...little mines all over. Now, that made it tough because... . I didn't have any problems in the mine; I had been lucky there, I had been lucky there. I was producing all we had to. My problem was to keep production down so we could keep some market for the other mines and clients.

But my first experience with international importance was that Stover invited me to go to Washington with him to sign a

commitment to guarantee the antimony production for the war effort, that is, within the limits of the Laredo Smelter. I was a young man, you know, just coming off the hills. That was a hell of a great opportunity to see the world beyond El Paso and Wagon Wheel Gap.

M: What do you remember about the trip?

T: It was a hell of a great commitment. Cost doesn't matter. You produce and you guarantee it. And for years, whatever the war lasts, that's your job. Whatever it costs, don't worry about it, so it was a condition in which very few miners have ever been in. We all have to worry about the national price...up and down.

M: Well, what about the trip to Washington? Did you ride the train? How do you get there?

T: Of course, we rode a train. What else? (chuckles) We rode a train. I forgot what it took. Two or three days...two days, I guess. That was no problem; I had been going to El Paso from Mexico City second class every year back and forth. It used to be two and a half days, so there was no problem to ride first class whatever first class was in those days. There was no room in the pullmans, you know. They were all taken for special commissions. Traveling was difficult not only here...everywhere. Everything was full. Everybody was moving. Soldiers or trainees were moving back and forth. Buses and trains and everything was full, but we went to Washington with Stover. He was an old Texas Miner. He was

old, he must have been close to fifty by then, and he was important. We felt important, let's put it that way, to be called to Washington to sign a commitment.

M: What was the agency that you were dealing with? Do you remember?

T: Remember the War Board? Something War Board in it's name. It was the strategic planner for supplies for the war effort. Whatever the bureaucratic name...I don't remember it. You know, we were very important for a day or two. (chuckles) We had to go back and dig.

M: Did they ask for technical information about, you know, the capacity of the smelter, the capacity of the mines, or anything like that?

T: No, no. They were people who had no idea what antimony was or what mining was or where it came from or how it was mined. All they needed was the guarantee that antimony would be there for the war effort for whatever years it took. We weren't the most important people they were talking to. We were talking about antimony and they were worrying about everything else.

Well, anyway, we went back to digging and I got married. And this is one story for mining wives about mining wives. Evidently, I took a month off being fairly big. I was still unit superintendent and I had Hilbert's job, so I was in and out and I would come around to Mexico City once in a while to see my girlfriend- future wife- more often than the years passed and, eventually, we got married in November of 1943 and

we decided... . So I took a month off for vacation and we spent a month on a honeymoon trip. We couldn't go to Europe. (chuckles) We couldn't go anywhere, but we went to Guadalajara or, whatever...just Acapulco, the usual things.

So after a month of honeymooning we arrived at Wadley one Saturday afternoon on the train. Evidently, the whole staff was waiting for the boss there with a new wife. And, sure enough, at our house in Wadley they had prepared a party. So that was a nice party. The next day they had prepared a Sunday lunch at pool side. By that time my wife was thinking that she had come to a country club life until Monday morning came. I woke her up early and told her, "Well, light the wood stove and make us breakfast. We got to be going to the mine." She never did learn to light up a fire in a wood stove, (chuckles) so I had to do it for her.

So, eventually, we started out early in the morning from Wadley in the pickup and it was drizzling. We drove all the way to the foot of the mountain. That's the end of the aerial cable that brought down the ore. And that was the end of the road. We had to ride horses up the mountain to our house. Well, you know, it was drizzling. We, of course, suited her with a *manga*. A *manga* is a horseman's raincoat. You have to know how to handle it to keep from getting wet. And she was no expert, so she was a little [wet].

End of Tape One

Side B

Beginning of Tape Two

Side A

- T: But she managed to survive it. She would come to Mexico very often. We had to bring back gold bars every fifteen days.
- M: So you poured dore right at the mill.
- T: Yes, they were gold bars. There are still gold bars. There are still gold bars coming out of that mine. Not silver bars with gold...gold bars with a little bit of silver. Well anyway, she, of course, in that situation would take advantage.

By then [José B.] Zozaya, [Ruperto] Aguilar and I were working at the mine, the three of us that had left the antimony business, and we were lucky as usual and had a hell of a nice business. And with, well, Vaupell and García getting rich...we thought old because they were, well, Vaupell must have been fifty-five and García about fifty-two or fifty-one. We thought they were very old. They were fat. They were getting fat...rich, fat, and lazy with so much money and I decided....

García in one of his trips to the mine said, "Would you object that we bring Arguelles to be boss of all our mining operations in Mexico City? He would be your boss." And, of course, Arguelles had more experience. He was a Texas Miner that had graduated a couple of years before I did, but a couple of years made a lot of difference in these early stages

and, besides, he was a hell of a wonderful man and a hell of a good miner. I said, "No problem. One condition: if he doesn't accept by December 31 I get the job." He said, "No problem."

Well, November came around. I took vacation, went to see Arguelles, and he said, "I don't want the job. My family is now living in Monterrey. They're happy there. We are running this..." He was running that mine. He was a partner with Vaupell and García in the lead mine. He was running a little milling operation- not ore milling, but lumber mill operation- of his own. He was doing fine. He said, "I don't want the job." He said, "You take it."

So December came along and García went to the mine. The next time he visited I said, "Well, I'm going to Mexico to take over this job." And he said, "No, we're not ready for that yet." So the next time he went to the mine he saw all my wife's things being packed. He said, "What's the matter?" I said, "I'm leaving on December 31." "What are you going to do?" "I'm going to manage my little ranch." I had a little ranch here, not too far from here, probably worth a fortune now. Imagine what it would be worth. "That's what I'm going to do."

Well, he didn't like it at all, so I turned it over to Aguilar. Zozaya had gone off to Chihuahua to work at Corralitos and Aguilar, the younger of the three, was the second over there so he got the job. He got the job because

I wrote the letter. And he got the job because I wrote the letter and left. As it turned out I, actually, didn't look for a job. I wanted that job. I wanted the job with Vaupell and García; I wanted to be a partner of Vaupell and García's. So as it turned out we did alright because for a few months I had nothing to do but go to my ranch.

M: So you did actually leave then. You quit working for them?

T: I had a lot of money.

M: Yeah?

T: I had about thirty-five thousand pesos in the bank. That was a hell of a lot of money. Don't think seventy-five pesos today...we'll spend that for lunch today. (laughter) (taping stopped and started again)

In about three or four months García called me and said, "We've got a problem in one of the mines. Would you give us a hand? You're doing nothing tending to that damn ranch." I said, "Sure." So we made a deal, fifty dollars a day...fifty dollars a day. He said, "Well, a few days, it's not bad." He was used to paying me a pound of gold a month (chuckles) so a few dollars, fifty dollars, wasn't much.

So I was fine. I'd work a few days and that made our living, you know. We could live on a couple of hundred dollars a day, so four days work was fine. But after a while November came along and he got a bill for twenty-five days I had worked for him (chuckles) at fifty dollars a day. That was an unheard of figure for pay, so he said, "Look, let's

make a deal again. You come back and take over that damn job you've been wanting all the time." "Well, let's negotiate a salary," I said, "The same pound of gold a month." And he was making fifty kilos of gold from that little gold mine a month. In those days income tax didn't take it all like it does today. We didn't have all the problems that you have today. Fifty kilos of gold was a hell of a revenue.

M: Do you remember some of the grades that you were mining there at Nukay when you started?

T: Yes, yes. (refers to paper) Look at the date of this paper. It's signed by me there a little faded...the signature. Look at the date.

M: Okay, in [19]48.

T: For fourteen years we milled eighteen-gram gold. [18 grams per ton of ore]

M: Gee!

T: In that mill.

M: With what silver values?

T: Huh?

M: What silver values did they have?

T: There's the grades. (points to paper) There's the summary of the grades. Well, anyway, as it turned out the Korean War was coming on, prices were going... I was lucky again; all of Vaupell and García's operations were booming and I was a pretty lucky guy. We made quite a nice organization out of it. We used to have a lot of good men.

M: What mines did they operate in those years?

T: We were operating four or five mines: Colorada, which is still going in Zacatecas...

M: Which one?

T: La Colorada in Zacatecas.

M: Oh, okay, yeah, Chalchihuites.

T: Huh?

M: Near Chalchihuites.

T: Yes, Chalchihuites, near Chalchihuites. We were at Dulces Nombres in Nuevo León, Nukay, of course, and we had a couple of other operations in the developing stage, but we were doing just fine. Vaupell and García were getting richer all the time as the time was going on. I wasn't getting poorer...not with a pound of gold and my participation. As it turned out, for twelve years of the fourteen, I got a check every year from García even though I did not longer work for him with an amount of money that was supposed to be my participation that had been negotiated before. I never argued about it, never looked at the numbers. It was, just to tell you, that one year it was more than my yearly salary. That'll give you an idea that I didn't argue about how much.

But once, interesting, he had a reputation of being very stingy, very tight, with his money. He kept up his reputation, when every year, no longer working for him, I would get a check from him, signed by him, from the company. And I would never thank him for it, and he would never mention

it, because it was degrading for a stingy guy to be giving money that he didn't have to give. That sort of thing. That's some relationship. It was a lifetime relationship. He had a lot to do with my successes, if you can call it that, in the mining business. That pretty much ended that part of it. As it turned out, now, there was to be a big change just for a couple of months.

Eventually, we realized that we should stick to the limestone contract of the skarns because the iron ore body was up to eighty meters wide, so they were lost inside of that mass. That's where we got to the high-grade stuff that made the unit. And the stoping in that first stage of Vaupell and García life, it lasted fourteen years of operation. We milled about half a million tons of eighteen-gram gold. And in my time we had total costs. As far as my controls went, it was five dollars a ton.

M: Mine and mill?

T: Total company costs...five dollars. Now, that was only eighteen-dollar ore, but they were big dollars. You young fellows can't...you think of dollars as something. Dollars are little bitty things today. They were big dollars, eighteen dollars, and our cost was five dollars and something. It was a profitable business. We would bring in twenty-five kilos of gold to his house here in Insurgentes, not far from here, every fifteen days. What he did with them, it was his business. Twenty-five kilos every fifteen days all the time.

It was a nice profitable operation.

Well, we're coming now to a big change. One of my mother's sisters married a man by the last name of [Adolfo] Ruiz Cortines. She married him because he had been my father's personal secretary for fifteen years. Eventually, he got to be president of Mexico. And I'm guessing that the only miner he had ever heard of was me. I hadn't seen too much of him because I had spent a year in the States and then in the mines, so I hadn't seen much of him myself, but he had heard of me from my father and, probably, that's where he got the idea that I must have been pretty good. So he named me General Director of the Comisión de Fomento Minero.

M: Okay. Now, this was in what year?

T: In 1954.

M: So you went directly from working with García?

T: Working with García.

M: To being director of the Comisión de Fomento Minero?

T: That's right. And so I went with García's blessing. García had been one of the founders of the Comisión and, as an important member of the board, I went with his blessing.

M: Tell me a bit about the history of the Comisión de Fomento Minero up to that time.

T: It had been not much.

M: Alright, some of the history about the Fomento Minero up to [19]54.

T: Comisión de Fomento Minero had been part of the 1931 Mining

Law, the mining law generated it. Now, the mining law stipulated that it was a developing commission. That's what *fomento* is...development. In its early years it hadn't done too much, but the law had given it reservation rights for unclaimed land, *reservas*, that eventually turned into the *Reservas Nacionales*, National Reserves. It wasn't too prosperous an outfit, but it had a lot of equipment that wasn't working and it had a lot of ground that it could control, all the national reserves, but they just hadn't made money out of it, so it was a big turn. I started a thirteen-year period in my career in public service.

This was definitely a public organization, but the *Comisión* had no federal budget. And I always said that 'He who pays commands.' Nobody paid us, nobody commanded us. We were pretty independent and had resources to work with...no money. We were no bureaucrats. We had to make our own way, which is something bureaucrats don't do. And it was a hell of an opportunity because by then we figured we had quite a bit of experience with small mines. We had all the availabilities of many mines in the country that were shut down, but the Commission in our time was not made to compete with the miners, but to help the miners. We refused to take any mine. When we lent them money we didn't accept the mine as a guarantee because we did not want his mine. We had a philosophy that's very common now, but it was to be very, very unusual in a period of central control and socialistic ideas

about government activity in the mining business. Well, at that time we did pretty well. We were lucky again.

M: So let me just ask: you, essentially, were free to pretty much develop your own policies as far as what Fomento Minero was going to do?

T: Yes, yes.

M: You weren't going to have a lot of input from the president, for example, or other cabinet members?

T: I was named director general of an outfit that had no place for a director general because it was made by law and the man with the power was the general manager. All the legal powers were in... . So when I was named director general there was a man there, great man, great miner, Osvaldo Gurria Urgel, a mining engineer that was to be a second father to me in my life.

M: What was his name, again?

T: Osvaldo Gurria Urgel. He was a very much appreciated technocrat, or bureaucrat, and holding an existing position. So when looking at that I accepted the general manager's position with all the powers instead of the other one that was... . But it was a smart decision except for the fact that his salary was almost twice as much as mine, but it didn't much matter. The opportunities were there. It was very enjoyable. We were very successful. We had a wonderful relationship, Gurria and I. Since I traveled so much to the mines he was running the show here. He was the General

director of Real de Monte. I was his miner. I was the man with the mining experience, so I was his consultant miner and I was a member of the board and of the executive committee of the company.

One interesting part...I had been a student trainee at a hundred dollars a month and then for thirteen years I was a member of the executive committee of the board for thirteen years at no pay, at no pay.

M: Now, okay, this was at Real de Monte. Now, was Real de Monte at that time, was that run by Fomento Minero?

T: Gurria was the director of both. We did not do any mining. The Comisión, in our philosophy, did not do any mining. We would help the miners do the mining, but since it was a government thing they had named Gurria to be director of both.

M: Okay.

T: Anyway, I was never sorry for that decision in thirteen years because it wasn't too long before I was named as head of what's now the Consejo de Recursos Minerales on top of being the general manager of the Comisión.

M: Okay, so you were doing both at the same time?

T: Yeah, but first let me get that straight. I first read in the paper that I had been named Director of Mines and Petroleum, a bureaucratic position, in this Secretaría de Comercio. That's a bureaucratic position that I didn't want. Now, by that time I was general manager of Santa Rosalía, the old Boleo property in lower California. When I read that in the

paper I got the plane and took off to Lower California. I didn't want the job, so I stayed about two weeks over there. And they waited for me. When I came back they said, "Well, you have to take it." I said, "I'm awfully busy at the Comisión." "Well, you take that, too." So I was both things and general manager of the El Boleo properties.

M: So what other properties was Fomento Minero involved with at that time?

T: It was involved with many, but working none. The Comisión did not work the El Boleo. I was manager of both. The Comisión did not run Real de Monte. Gurria was director of both and many others. Well, eventually it got to where I was named Director General of the Consejo on top of the other two.

M: Now, eventually, this was at the time the Consejo de Recursos Minerales No Renovables. That was the time of that?

T: The Instituto de Recursos No Renovables, precursor to the Consejo. And that commission, or that job, was to be temporary until I put things in order there. So I went on to take that over for about a year, put things in order, and then turn it over to somebody else that had less to do than I did. I was a pretty busy man.

And there I had the opportunities. The economic success of the Comisión gave me not only a good salary, but gave me all the facilities for traveling expenses, of course: automobiles, everything, airplane. I had an airplane to fly in. I had all the means. I used those thirteen years to

become the man that knew all of the mines that were working in Mexico. That was to be valuable in the future as a consultant...the guy that knew all of the mines in Mexico.

M: What would you say, what were the kind of main successes that the Comisión Fomento Minero had during the years you were working with them? It must have grown from a really small organization to one that was quite a bit bigger when you left.

T: No, no. Remember, times were... . We had right by law. The development of the Frash sulfur mining brought in nice royalties to the Comisión. We developed many properties not for operating, not to be operated by the Comisión, but we always kept a royalty when we turned them over to private initiative. That's where we were able to make our money. We never had any federal money. We generated our own. Now, since we were supposed to develop mining we were, in a fashion, in the banking business, but with one big difference with later years: we had to make our own money to lend it and we took very good care of who we lended it to. And we lent it to those that were working and those that were going to work; we knew the business. We knew who to lend it to. And we had a tremendous banking record of about ninety-nine percent recovery of all our loans to the small mining business, which is a damn risky business...lending money to small miners. And we had through the years ninety-nine percent recovery, but we knew the business. That was a great thirteen years.

During that time I had many opportunities, like being the second president of the Association of Mining Engineers. And during my presidency we made the first convention in Chihuahua in 1955. You were at this last one [in Acapulco]. And to make this comparison- and I'm going to tell you what I tell these young fellows today that are present-day presidents- when they brag to me about the millions of pesos that it cost to organize the convention, all the millions of pesos of profit that they get from it, and the three thousand people that go to the convention, I cut them down to size by telling them, "When I made the first one we were eighty-three mining engineers...geologists and metallurgists, of course, the three." When I say mining I include all of them. "We were eighty-three mining engineers that got together. And with wives we were a hundred and twenty-one. Our budget had been sixteen thousand pesos, but only eleven thousand [was spent]."

End of Tape Two

Side A

Beginning of Tape Two

Side B

T: "If there hadn't been a first one there wouldn't be the twenty-fifth one that you went to in October of last year." Well, those were opportunities brought to me from having been

in the public sector as we call it here but, actually, what I did was to get to be really informed of what the mining business in Mexico is all about. I don't remember any milling operation, any mining operation that was [not visited by me]. If it had a mill I had visited it at one time or another. That came from having had the resources: the expense accounts, the airplanes, the cars, chauffeurs, whatever. But we had generated it all. We were no ordinary bureaucrats because since nobody gave us money, nobody told us what to do, we took the responsibility. Gurria and I- we were together all the thirteen years- took over the responsibility of developing this developing agency quite successfully. A lot of my boys that had worked with us went to work for the Comisión in those days, a lot of them you see here today.

M: Well, now, those would have been interesting years in the government in the late [19]50s leading up to the Mexicanization law. What do you remember about the attitude of the government, particularly, in those years right before the Mexicanization?

T: There is a diploma amongst those there (points to various framed documents on wall) that names me one of the great Mexicanizers of the mining industry...one of those. Which it might be, I don't know. (points to wall) You see all those diplomas up on the wall?

M: Yeah, right.

T: The present president of the Cámara Minera, the Mining Chamber

of Mexico, is a young man that was raised with us. Professionally, he worked with us all his life. Now, this young man is the president. And he was sitting there in that chair that you're in and I told him, "In two years you'll get one like that." I said, "You will be short the other twenty-five." Well, anyway, it was a battle, but that's quite another story. Where are we? Would you like to...

M: We'll leave that to a little later. I would be interested in hearing what you have to say about the Mexicanization.

T: Yeah, that's interesting. We could talk about it. Okay, we come to the end of my thirteen years in the government. In government- that's a question mark because we were an agency- I was Director of Mines for three years, which I paid very little attention to because I had a subdirector that did the work.

As you can imagine, in those days things were simpler. At eight o'clock in the morning I'd be in my office downtown talking to all the offices of the Comisión but- in those days it must have been eleven or twelve- over the radio. No faxes then. Over the radio I would be talking or talking to Santa Rosalía. Now, by nine o'clock I had talked to my secretary a little while and then I'd go to the Dirección. I would get there before ten o'clock. We had a special place for the directors of the Secretariado, so that was strictly a bureaucratic job with a miserable salary that I used to distribute amongst the poorly paid men in the bureaucracy

business. My salary was not significant. My bureaucratic salary was not significant even then.

So I would be there and I would come out at two o'clock and couldn't believe it that I didn't go back to work until late hours of the night. They used to say, "Well, what if the boss calls you?" "Well, he won't find me. After he calls ten times and doesn't find me he'll call the next guy and let him do the work." "Did he ever say anything to you?" Nobody ever mentioned the fact that I wasn't there. I was roaming all over the country. The bureaucratic job had nothing to do with all the important things I had to do.

M: Were there other government agencies in the [19]50s, Sal, that were at all similar to the Fomento Minero in the sense that they did other things?

T: No, I was the boss of all three of them at one time.

M: But, I mean, there wasn't something even...

T: The subsecretary was a miner. He was usually the head of the mining. In the bureaucratic job he was the boss, but he didn't intervene too much with the Comisión- none- because he provided no funds, so he was no boss. No boss that doesn't control the money, he doesn't run things. So that's an interesting story. So we come to the end of that.

It was time that I was thinking about leaving the public service sector, whatever you want to call it, in order to get back to digging. I had always been digging because I had been general manager of Santa Rosalía for all those years and we

had really had a mining problem in our hands there for many, many years. We had been very successful there, too, at the end. After ten years of real hard times we had had three years of very good times. We had been lucky, again, and we had put up a LPF plant. You never heard of them because they were a last century process: leach, precipitate, float without separating solids from liquids and using sea water. That was a hell of a process. We had a hell of a battle for years with it and, eventually, it paid off. It worked.

Well, with all that, García, by that time was the vice president of Peñoles and one of the principal stock holders of Peñoles and he was battling with his other stock holders that they wanted me to take over. Bernie Roy was Mr. Peñoles. That's before I came to Peñoles. We have to know about that. Roy had been a German officer in the German army during the war. He had been involved in some way with the attempt to kill Hitler, but he was lucky to be in Spain. He had been sent as a communication expert, an officer, when he failed. The attempt failed, so he got protection from the American embassy in Madrid to keep him from going back. There he met his wife, Mary, who was an American working at the American embassy in Madrid. So, eventually, they got married in Madrid and went to New York. He went to work for a gentleman. He spoke no English, no Spanish. He was an engineer, but not a mining engineer, and he went to work for American Metals, which was a basically German-controlled company. And so this

German, they gave him a job and sent him to Mexico as an ore buyer for the smelting operation in Torreón. Being a European he spoke English, always, with a German accent, but within three months he spoke Spanish. Within six months he spoke it really well and he had made friends with everybody in the country.

Eventually, the Mexican management of Peñoles was jealous of the popularity of this Peñoles employee- in Mexico all the others were not popular- so they sent him back to New York. That was their mistake because he was there close to the big shots and he convinced them that Peñoles was a dying operation, who had been so important at the beginning of the century, but their mines were dying off. So that happens that he tells them, "Look, we have to Mexicanize that company." It wasn't required by law. "We have to..."

M: This was, okay, before the Mexicanization law?

T: Yeah, before it was required by law. "We have to Mexicanize it, get rid of all those graduates from Ecuador." They were all Americans, but they came from a failed operation in Ecuador. We called them Ecuador graduates. And so he convinced them and they said, "Okay, you go back there and you run the show. You do all the things you say that ought to be done."

So he came to Mexico and the first thing he did- this fellow you're going to have lunch with, [Pedro Sanchez Mejorado], was a geologist with Peñoles. And Peñoles big

shots lived in a, I would say, a fortress colony within Monterrey...absurd. They all lived in there locked up, big wall around them, all foreigners in there. Pedro lived with the natives in town, which, of course, Monterrey was no little place. And so Roy gets there and the first thing he did, he gave the director's house to Pedro inside of the fortress. That day ten of them resigned. He took their resignations, all those that didn't like him. That was just one of the steps. He was really out to Mexicanize it and he did. So in Mexico he started looking for partners to Mexicanize it and get a new push, a new life, into a dying company.

M: Well, let me ask you this, though, Sal, do you think his assessment of the Peñoles company at that time as being not in particularly good shape, was that correct? Were the Peñoles mines in trouble?

T: At the first part of the century it was the biggest mining company in Mexico. Through the years the Depression killed off a lot of their operations and they never came back. Their mining operations were pretty bad. Their smelting operations were obsolete, but the company lived off of the smelter and three little mines- one not too little, but Avalos Mine has nothing little about it today- and two other mines. That's all they had, going down the drain, but Roy, he came and invited García in to Mexicanize this. García invited Balleres. His son, now, is the owner of the whole show, or runs the whole show. He's the biggest stockholder of the big

show today.

Anyway, the first step that García and Roy did was to buy Fresnillo, which was a company nobody wanted. But, as things happen in mining or everywhere else, somebody's son had married somebody's daughter. The daughter was the [child of] the guy that controlled Frisco, who was the main supplier of concentrates for the Peñoles smelter. So the two father-in-laws get together and say, "Well, you send it to my smelter." So Peñoles was going to be short of about one-third of its whole...so they went out to get Fresnillo to get the Fresnillo concentrates and substitute that.

Well, anyway, he was Mr. Peñoles. Roy was Mr. Peñoles. He invited García, but they both ran the show. And that's where I come in. García insists that with all this success... . Roy had started Química del Rey very successfully. He had done many things. The company was thriving and the only thing that wasn't thriving was their mines, but- except Fresnillo was doing alright, Naica in Fresnillo- but, whatever, the company was thriving and Mary wanted to go back to the United States. And Roy was the Director General of Peñoles. So Mary was nagging Bernie, who didn't want to go to the States for nothing; he was very happy here, he was popular here, he was somebody here, but Mary always... . So he got the idea that they needed a new director to run Peñoles because Roy was getting on in years and, besides, getting a little... . He wanted to keep peace in the family and go to live in San

Antonio at a ranch he had bought in San Antonio. He was doing fine economically. He had bought out his old outfit.

M: American Metals?

T: Yeah, García. Peñoles bought out American Metals completely, so it was a prosperous company. So that's where I come in, when it came to substituting Roy. So I went to work for Peñoles and we started making mines, and we did it successfully. In relatively few years we made a number of very nice operations, some of them still going, so that gave me a real push. Fresnillo, Fresnillo...of course, I was a member of the board of Fresnillo. García was the chairman of the board of Fresnillo. He gave that a push. That's another story; why the success of today's Fresnillo after it was a dying unit.

Anyway, speaking to Peñoles years, it became evident I was approaching to be an old man of fifty years and I started thinking that I had, maybe, twenty more years of digging. I didn't know it was going to be forty more, but I started thinking. One day I walked into Mr. Peñoles's office and said, "Bernie, this is your baby. You're not ready to turn it over to anybody. I think you enjoy running it. You keep running it. I'm leaving." He said, "The two bosses won't let you go." I said, "Well, I won't resign until I have convinced them." So I went to see García, my old boss. And he said, "Niet! No!" So I went to see Balleres, the old man, Don Raul. And he was the chairman of the board with Peñoles.

And he heard my story and he said, "You know, I like your guts. I like your attitude. Peñoles will manage nicely. You can keep helping us anyway." I said, "Yeah, but we got a problem. We got to convince García." He said, "I'll convince him." So that's how I was able to leave Peñoles." But...

M: How many years did you work for Peñoles?

T: About three-plus years. That was enough because I had made a hell of a good organization with some of my Nukay graduates, my Santa Rosalía graduates. The graduates of the University of Nukay have done very well. Well, Pancho Romero, the guy you just met, is one of them, Zozaya, Aguilar; we're all graduates of the University of Nukay.

Well, Roy, of course, we're good friends. He said, "Well, how are you going to help us?" I said, "I'm going to put up a consulting office." And he said, "Well, you'll do fine. Nobody knows this business better than you do, so you'll do alright." He said, "Okay, make a deal. You keep on helping." I had taken one of my boys, who was the Director of Mines in Peñoles- we had been successful- Carlos Sierra. And, of course, he had come to me all of his life for advice, so it was no problem for him to keep coming to me for advice. He said, "Okay, we'll have a lifetime retainer's fee of twenty thousand pesos a month." We lived with half of that, so it was no great... . By that time I was living in this house where we are now. I had no economic problems, had never had any after all that success. The Peñoles salary that I was

giving up was one of the highest salaries in the country, but it didn't much matter. I never had to worry about money and so it was no great shake to...

M: Well, what was it you didn't particularly like about working for Peñoles?

T: That Bernie wanted to keep on running his show. There was no use of the two of us in there running that one show.

M: So Bernie never did really leave? He just kind of hired someone else and then stayed on.

T: But wanted to run it. He wanted to keep parts of the company. I went in there as assistant director with him for a year and at the end of the year, being the Prussian, he said, "I told you within a year, so you're promoted." I said, "No, let's leave it like it is because you want to keep running some of this show and it's better this way. As long as I'm your assistant, well, you keep running what you want to. I'll run the mines and smelters. You run everything else." "No," he said, "I told you you'd be general director. You're it, okay?" I got a promotion, I got a bigger salary, but he kept running the show. But we were good friends. No struggle between us. I kept that fee until- it was a lifetime fee and I never raised it one penny after inflation...devaluations. I never raised it ever one penny because it had been a big help in the early years. And that pretty much ended another phase in my career.

I was now a consulting engineer with my own office.

Arturo Morales, Texas Miner, had graduated a couple of years before I did, had gone to work in the mining business and, eventually, went to study at MIT and he came back a hell of an engineer. While we had been learning to be miners and managers he had been learning to be an engineer. Evidently, from that day on I never had to multiply two by two again. He had been working for us in mine design. He designed most of the plants in the last many years here in Mexico, so he had his office in Avenida Juárez. That's where I went to. It had been planned that way for the two of us, so we had this common office. He was in engineering and I was a miner.

Within a month of having become independent, I had been called from Fundidora. Carlos Prieto, the president, called me and said, "We got problems in our mining division. We want you to run it." He wanted to give me the job of Director of the Mining Division. And I said, "Niet. I didn't leave Peñoles to run a mining division of any other company. I said, "No. Let me look at your problem and I'll see if I can help you." I came back and said, "You sure need help, but I'll make you a proposition. I'll run your division from my office away from all the bureaucracy of your big building here full of bureaucrats."

M: Now what company was this, Sal?

T: Fundidora de Fierro y Acero Monterrey.

M: Okay.

T: And Don Carlos said, "That's quite irregular." "Well, it has

to be. I'll run it from my office. I'll run your division."
"Well, we'll have to name you." And I said, "No, don't name me director. I'm not going to be an employee. I will run it. Just name me the chairman of the board of your mining companies." Well, he eventually got the idea and he said, "Two of them I want to continue being chairman of because I've been chairman for many years." I said, "Okay, I'll be the *consejero delegado*. That's, actually, the equivalent of the president in those companies in which I was not the chairman of the board. In the rest of them I was the chairman of the board.

So I ran the show from my office with one secretary. I cut down on the overhead of that division by ninety percent. That just was a month after becoming independent. I never again had a salary. And at my discretion, at my discretion, was my fee. I always considered that the salary of the other directors, four other directors of the company, would be tops, but I didn't consider that. I never charged them even half of the other salaries. There was a big difference. My car was my car; they were driving company cars. My chauffeur was my chauffeur; they had company chauffeurs. My secretary was my secretary. My office was my office. That was the big difference. You know, for many, many years- what, it must have been fifteen years that I ran their raw materials division- and I never presented an expense account. That

didn't mean that I paid everything. I used the company's...

End of Tape Two

Side B

Beginning of Tape Three

Side A

M: We're in Mexico City at the offices of Salvador Treviño. We're going to record some of his memories of mining in Mexico. The first recording that we'll do this morning is to cover some part of the conversation we had yesterday on March 5 that was not adequately recorded, so I'm going to ask Salvador to repeat some of the stories he had yesterday beginning at the time when he had been transferred back to Wadley with Refinadora, had just recently married, and his wife and he had arrived in Estación Wadley and were making their first trip up the Sierra de Catorce to arrive at the manager's house on top of the mountain.

T: Right. So we recorded that about the wind. Just to give you an idea about the weather on top of that mountain; the trusses of the roof were all anchored to dead men on to the rock to the floor to keep the roof from flying off the house when the winds blew as they usually did.

Well, anyway, they were happy years. They were

successful years. The war lasted all the years, you know. We were able to comply with our commitment to Washington. It was my job to provide the smelter at El Paso with the ore necessary to produce five hundred tons a month of antimony bars.

M: This would have been the smelter at Laredo?

T: The smelter at Laredo. And we couldn't provide more. Wadley was, of course, the most important mine not only in the country, but probably in North America...antimony mine. It was a big one in a very small league, which is antimony mining, because antimony mining makes small mines.

M: Well, you were saying yesterday, though, when you got to Wadley that there was some exploration headings that were already in progress that you continued and had some success of finding some profitable antimony reserves.

T: Right. It was a very big mine which, of course, I was not familiar with, so instead of changing a lot of things I just continued the explorations that had been started by Vicente Cisneros, the previous manager there. I continued with them and ran into very good ore that made things very simple to fulfill our commitment with Washington during the whole war effort. That lasted very well until the end of the war.

National Lead bought out the company, the smelter and the mining part of it, and they came in with ideas that had nothing to do with our experiences- by that time, about sixty years of experience- of the company providing the relatively

small market for antimony. They came in with ideas trying to make a big operation out of antimony and you know, as all miners know, that nature has more to say than we do about what a mine ought to be doing, what the size of the mill should be, than all the brains in the main office, including the brains right at the mine. The mine itself tells us what it's all about. They couldn't understand that antimony was a good, profitable, little market that required to be operated as a small company with small mines even though the Wadley Mine was big in physical terms, but it couldn't be bigger than the market required.

Well, whatever, those four years that we lived up on top of that mountain, were very happy years newly married. My wife adjusted very well to being the first lady of the whole sierra and, to her credit, all throughout that sierra she was never known as Mrs. Treviño. She was known as Señora Lolita, which meant a lot because it meant that she was representing her own personality and not the boss's wife. She adapted very well.

Right here I'll tell you a story about her, the last one I'll tell about her. Years later I was the general manager of the old Boleo district in Lower California and I told her, "You know, I want you to go to the mine with me the next time I go because I want to see all those beautiful young ladies in that town. In an area of beautiful women I want them to see me married. I don't want any temptation." So she went.

Obviously, without argument, she went and the ladies in camp and in town prepared a meeting or a tea, or whatever, to meet the boss's wife. And one of the ladies told her, "Oh, after Mexico City this must seem to you like a very small and ugly town." And, you know, she said, "Well, maybe after Mexico City maybe you're right, but after where I have lived this seems like Paris to me." That says a lot about the many, many years she spent up in many mountains. Well...

M: Tell about when you were working for Wadley during the war years that you had to go to Washington to guarantee production of antimony as part of the war effort.

T: Didn't you get that? Okay, well, Stover, who was the general manager of the company, was summoned to Washington to make a commitment for the War Board. Their responsibility was to provide the raw materials for the war effort and, of course, it was very important to them and so they summoned Stover to answer questions about his supply of antimony for the war effort. And he invited me to go with him. We got to Washington, which I felt pretty important to be going to Washington. We did sign; both of us signed the commitment to provide at whatever cost the antimony required for the war effort. The capacity of the Laredo smelter, that was our commitment.

M: Well, what was the obligation of the government when you say at any cost, Sal? Would that mean...

T: It was pretty much an arrangement by which I would almost

describe it by saying it was cost-plus operation.

M: Okay.

T: They weren't caring about what it cost, but they did not want to do without it. That was the philosophy of the war, of course.

M: Well, how did they guarantee you to cover your costs? I mean, were you selling antimony to them at a fixed price for the metal or how did that work?

T: The Laredo Smelter would handle that end of it. Our commitment was to supply the smelter, but the actual charging them, in our mind, was the obligation to provide the antimony ore for the smelter and at minimum cost, of course. But, whatever, they were very good economic years. Very few miners ever have that opportunity and hope they don't have it again.

M: At the time you were working in Wadley is when you had the accident that cost you your eye, is that true?

T: Yes.

M: Could you relate that story, please?

T: Well, as we said yesterday, a miner was having trouble drilling even one hole with those big machines we used to have mounted on a column. And the Timkin bits that we used in those days were... . The miner, the driller, would get a string in which there was a new bit: one with one grind, one with two, and so on and on. The hole would be getting smaller. This fellow would come in by ten o'clock in the morning, report up to the office to say he couldn't drill that

hard rock. So one day, July 6, 1946, I told him, "Well, set it up. Have everything ready. I'll show you how to do it." And showing him how to do it I got the corner of one of the bits in my eye. That was the end of a nice-looking blue eye.

M: Then shortly after National Lead had purchased Refinadora you begin to look for another job, another opportunity?

T: Yeah, when...

M: When we were kind of just starting talking about your involvement at Nukay, your involvement with Vaupell and García.

T: Yeah, okay.

M: While you were still at Wadley.

T: We were talking about National Lead didn't understand the mining and we didn't like that at all. When they removed our general manager, Stover, Texas Miner, we didn't like it, so his Three Musketeers, which was myself and Zozaya and Aguilar, all Texas Miners, we resigned together and I went to work for José García to start up a little mine in Guerrero near the Balsas River that in those days carried the seven plagues of Egypt with it. But all of that's been cleaned up. Even the mosquitos are a fraction of what they used to be.

M: So what were the principal problems from a health standpoint?

T: Malaria, of course, was number one. The *pinto*, it's a disease of the skin, which makes it spotted. The skin begins to get pink and with the years eventually turns to white, which is a horrible color on any skin. We have no idea what it looks

like. White skin is a miserable, horrible thing, especially in spots but, anyway, that was bad enough.

M: And the insects?

T: Malaria. And, of course, all the bugs in the world...tropical or semi-tropical country. And they invented the *jijene* which is a little fly that can go through a mosquito screen. Those darn things, acutally some kind of a gnat, but they're a biting fly. Each of us went along all day with his own cloud of *jijenes* following him through the day and that's why we loved to be in the mine, because the *jijenes* would not go in the mine. They would wait at the entrance; when you came out they would be waiting for you and keep you company for the rest of the day. Every man carried his own cloud. And when two got together they would become one cloud. When they separated they would, again, become two clouds. We never knew if they were the same ones or whether you had inherited somebody else's *jijenes*.

M: Tell me a little bit about the two gentlemen that you went to work with: this Vaupell and...

T: And García.

M: José García.

T: And José R. García.

M: What were...

T: Vaupell was C. W. Vaupell. He was a geologist from Butte, Montana, consequently somewhat of a roughneck in his early years, who had been fortunate because he had married an Irish

girl that kept control of his drinking. And he had become a partner of José R. García, who spent thirty years trying to make a gentleman out of him. That helped him along; in other words, civilized him pretty much, but he was a hell of a great miner. He was a damned good geologist. He knew the country on horseback. He spent thirty years, forty years, prospecting all over the country on horseback and he knew a lot. I was privileged to travel with him for about three years in his consulting jobs and learned a hell of a lot from the man that knew the business. He was a dear boss, dearly loved, dearly respected by all of us. He was a tough one. He was kind-hearted, but he was tough in some aspects. He could ride a mule for days on end with no problem. The problem with young people, like I was, on a mule was that we are impatient when we're young. He was never in a hurry. He would get on a mule and if he didn't get there in one day he'd get there on the next. As simple as that. I would want to get there in half a day and the mule didn't approve; we got there when the mule said so. The young man will fight the mule and the old man will ride with the mule; that's the big difference. Older men are much better mule riders than younger ones.

M: And what about Mr. García? What was his background?

T: He was a mining engineer from the University of Mexico, came from a mining family. They were mine owners. His grandfather had written a book on Mexican miners that is classical. He was a gentleman, highly educated, world-

wise. In his wealthy years he was a banker.

But his mining philosophy...I give him a great deal of the credit of having developed, actually, developed the New Fresnillo. He was chairman of the board later on. The one unusual thing about that company was that the five members of the executive committee, all five of us, were miners, so it was a company that was run by a mining mentality.

M: This was the Fresnillo?

T: Fresnillo. I'm talking about Fresnillo. Fresnillo went along for years absorbing a loss on the basis, I would say, of the executive committee, but mostly by the president of the board, which was the chairman of the executive committee, José García, that would say, "It's elephant country." He'd ask, "How much did we lose?" "Oh, so many millions." And he'd say, "It's elephant country. You keep looking." The New Fresnillo is the result of that philosophy. It's quite a story. That's not the complete story.

M: Well, tell me how you got started at Nukay, though. You went down to see the prospect before you took the job. Is that correct?

T: I got a wire from García. In those days there was no Fax and fancy communications. I got a wire from him saying that he would like for me to come to Mexico to interview him about a possible job, so it was a good excuse to come to Mexico. So we packed up and came to see him. And we talked about it and he said, "Well, you have been recommended by... . I have two

Texas Miners working for me and they're damn good," he said, "I'd like to have another one. These two recommend you." The two were Arguelles and Prado. They both said, "Quit looking. Go after this guy." Well, anyway, he said, "Well, let's negotiate your salary." And I told him, "I have to look at the mine. If I don't like the mine I'm not going to go. If there's no future to the damn thing I'm not even going to spend one day. I can spend one day, so let's go." And so he said, "Okay, we go tomorrow." I didn't have too much time off the job, so we went in his Packard. He had an old Packard. He was *riquillo*. In Spanish *riquillo* means he's a little bit rich. In that mine, eventually, we took the *riquillo* part out of it and made him very rich. That little mine made him very rich.

So we went there on the old paved highway to Acapulco part of the way to the mine. His Packard broke down with a fancied uniformed chauffeur, so we left him there, got on a local bus that picked people up in the middle of the highway, or the road. It was a combination freight and passenger bus, so we eventually got to the mine, to Mescala. There we got off the bus and wondered how we could get to the mine. We had lost our transportation. Nobody was waiting for us down there. They were waiting there for us at the end of the road that was being built to the mine. Well, whatever, nobody knew Minero Guadalupe. They didn't know about him, they didn't know about the Minero Guadalupe. Nobody could tell us. We

eventually got someone that could take us up to the end of the road, so we did get there. They were waiting for us with mules and horses to get to the mine from there.

Whatever, I liked the mine. I saw the possibilities of the mine. How I saw it, I don't know. It's a feeling that a miner gets or doesn't get. He may be right, he may be wrong, but the feeling has made a lot of our mines.

M: Corozonada?

T: Coronzonada. Now, that is very true. This important operation you see there on that wall, (points to wall to picture of phosphate mine) when I saw it, I never realized that there would be millions of tons of concentrate sold from that, but I had the feeling that it would be important, but I wasn't guessing. I wasn't thinking three million tons and, yet, the day came when we celebrated the three million tons of high-grade phosphate ore concentrate sold out of that mine. That's just on the side.

Anyway, I liked the mine. I figured I could survive the hardships that would come with living in a tropical country in Indian territory with all the problems. The Guerrero people were in those days supposed to be all armed, that it was difficult to survive there. It didn't turn out to be that. We handled the gold bars.

Here's the story. I used to come in. Everybody would know that we were smelting the gold bars because I would come down from the mine, ten kilometers, over the wooded mountain

road to the mill. The chimney of the *capellina*, which is the smelting facilities, would begin to make smoke. My pickup would be right at the door. I had come down to smelt the bars. And we were, at the beginning, not being much experts at smelting anything or even milling anything. At 3:00 a.m. in the morning, or whatever hour we finished smelting it, I would put the bars under the front seat and drive up to my house.

When I got to the house the wife... . (points to photograph) You could see in the picture that outside ladder. Alright, this is a tropical country; you didn't have to worry too much about windows or doors, except for the screens, because of the mosquitos. I would start hauling up the bars to put them under our bed. And when I got finished carrying them up at 3:00 a.m. in the morning, or whatever time it was, my wife would say when she realized that I was finished, "Don't forget to put the hook on the screen door." That was the only thing between us. And no fence around anything. You can see that...no fence. You were out with a hook. You remember a hook on a front porch screen door? So I would put that on. That was our safety arrangements in a land where it was supposed to be tough. If you treat people right they will treat you right. And they did treat us right.

M: But, now, when you first took the job then at Nukay Mine, there wasn't any facility?

T: No, there wasn't anything, no.

M: What was it like when you first got there?

T: I slept under a capire tree...capire. A piece of the trunk sits in the front part of my house in Cuernavaca because it was called for many years Treviño's Tree, Treviño's capire, because the first few days I slept under that tree there was no roofs anywhere yet. The road was being finished. No trucks were arriving, no bricks, no nothing, until the road was finished we [didn't] begin to get facilities to build. (points to photograph) And you can see from that picture that my house was a pretty nice house for the mountains. Every time I go into my house in Cuernavaca, right by the front door, I see Treviño's tree, a piece of the trunk. The open pit of today has, of course, eaten up all of the land where the tree was and where my house was as the picture shows.

Well, anyway, in those days we arrived and Zozaya followed me after me in a month or so, and Aguillar after another month or so, until the three of us developed that mine.

End of Tape Three

Side A

Beginning of Tape Three

Side B

T: That little mine made many good miners.

M: So tell me about the mine. It was an underground mine.

T: It was an underground mine. It was skarn-contact deposit between limestone and diorite intrusive. And it was an iron skarn, not a silicate skarn, evidently free gold, very fine. No one every stole a gram of gold out of that deposit because it could not be seen. We could see iron ore. We can still see it today...sixty-two percent iron.

M: Well, you couldn't even see it if you were to pan it down.

T: You couldn't pan it out.

M: Okay.

T: You couldn't pan it. You couldn't pan it out or the miners would have stolen the high-grade. No one ever knew if a ton of iron ore had one gram or had a hundred grams. None of us ever used our... . It was assay stuff.

M: Vaupell and García, then, had dedicated some money to develop the mine.

T: The four partners: two Frenchman, Geanti was a miner from Torreón, and Signoret, the owner of the Palacio de Hierro...

M: You're talking about the partners of Vaupell and García? The two Frenchmen?

T: Oh, yes, the partners. The three of us were miners, fairly young miners, but we certainly were not mill men or smelters of any sort. We built the mill because we were engineers and we followed maps made by people with experience to design a mill. And you don't become a mill designer by taking mill designing in college. And so we had built it, but they had

planned to capitalize the company with two million pesos. Those were big pesos, that's why only two million. They had spent eight hundred thousand when Aguillar and I- Aguillar was by that time in charge of the mine- found the key to the high-grade in the little ore body. It was not to be so little, but later on, right then it was a little ore body. And we were able to ship two carloads of shipping high-grade ore a week to provide all the money that was necessary to finish the development of the unit.

With one brag...I'd like to brag. It's the only mining operation, and I've had the opportunity to make five or six new ones, that within six months of having started the mill no farther investment was ever made on fixed assets. The compressor was what was needed, the power plant was what was needed, the mining equipment was what was needed, the camp had been built what was needed. No farther investment was made after six months of the mill working...never again saw it. All the other operations, fixed asset investments, are perpetual.

That brings us to the mining mentality of our boss, José García. Vaupell went along because García was the brains and Vaupell was the technical man, but García was the brains. And García's philosophy and his advice to us was this: if time is with you give time plenty of time. I have lived with that philosophy and passed it on to all my younger... .

M: Do you remember the grades of the direct shipping ore that you

road to the mill. The chimney of the *capellina*, which is the smelting facilities, would begin to make smoke. My pickup would be right at the door. I had come down to smelt the bars. And we were, at the beginning, not being much experts at smelting anything or even milling anything. At 3:00 a.m. in the morning, or whatever hour we finished smelting it, I would put the bars under the front seat and drive up to my house.

When I got to the house the wife... . (points to photograph) You could see in the picture that outside ladder. Alright, this is a tropical country; you didn't have to worry too much about windows or doors, except for the screens, because of the mosquitos. I would start hauling up the bars to put them under our bed. And when I got finished carrying them up at 3:00 a.m. in the morning, or whatever time it was, my wife would say when she realized that I was finished, "Don't forget to put the hook on the screen door." That was the only thing between us. And no fence around anything. You can see that...no fence. You were out with a hook. You remember a hook on a front porch screen door? So I would put that on. That was our safety arrangements in a land where it was supposed to be tough. If you treat people right they will treat you right. And they did treat us right.

M: But, now, when you first took the job then at Nukay Mine, there wasn't any facility?

T: No, there wasn't anything, no.

mined at Nukay?

T: Yes. We shipped nothing below forty grams. Of course, we knew that the high-grade would... . After we started the mill that was the end of high-grade. Never again was ever a ton shipped except to fill the commitments that we had gotten *anticipos*. How would you say that in English?

M: Prepayments.

T: Prepayment on. After the mill started we still had to make a few [shipments]. We had gotten a little pre-payment on some cars that we had shipped out. After that never again; they all went to the mill. Everything went to the mill. That was the end of high-grade; never again a ton was shipped anywhere.

M: What sort of arrangements did you have with Mr. García in regard to your salary?

T: My salary was one pound of gold a month. And I'll tell you why it was one pound of gold: it was four hundred and fifty dollars a month...exactly what a pound of gold cost.

M: But you also had a profit-sharing agreement with him?

T: I had a profit-sharing agreement with him: three percent for whatever profit beyond my control. That's what made it interesting. For fourteen years- no, about twelve years...with the two years there was no sharing. But for twelve years I got a yearly check even though for half of that time I was no longer working with Vaupell and García. The old man respected my participation even though I no longer worked with him.

- M: The dore production that you had from the mill. You brought those gold bars to Mr. García here in Mexico City?
- T: That's right. And what's more, we had to bring them up to his closet in his bedroom up on the third floor of the big house here on Insurgente where a big restaurant today is his house. And we had to haul it up because he was physically not too efficient. He was not going to carry the bars, so we had to carry it up to his closet. What he did with them was his business. We brought him twenty-five kilos every fifteen days for many, many years. In those days not too steep of income tax, if any, was paid. It wasn't any of my business what was done with it.
- M: You had an association later, which we'll talk about, with Mr. García when he became involved with Peñoles.
- T: Yes. I was no longer working with him.
- M: Was the mine at Nukay in those years, was that instrumental in some of the funds that Mr. García had available to invest, for instance?
- T: That was the basis of his... . He had been a prosperous small miner and, through Vaupell, they had a prosperous- I'm looking for the word- consulting income mostly done by Vaupell, who was the technical man. And he was a nationally-known geologist, so they had some income. But Nukay, of course, finished off all of that; Nukay made them very rich. And there was never any consideration of enlarging that mill. The old man's philosophy- he was an old man of about fifty-five

years- his philosophy is: "She's good enough at that stage. There is nothing better than a good little mine. None are better than a good little mine if it's good enough." And he was right. He kept it small. He made it last many years. Today it's still working and not only his fortune was made out of that little mine. A few other fortunes were made, including ours, from that little mine.

M: But, now then, Mr. Vaupell and García had other operating mines in Mexico?

T: Yes, they had about four operations and that's where- did you get that lost, too? That story about Arguelles was going to get the job? Well, to make it short, Arguelles had been longer with the company, was highly appreciated by both Vaupell and García. He was running their Dulces Nombres Mine in Nuevo León. Arguelles was doing well financially not only from being the manager of the unit, but he was a partner with Vaupell and García in a little lead mine that was doing fine and he had a lumber mill of his own up in the sierras there. And his family was living in Monterrey quite comfortably.

And García had decided to bring him to Mexico to be the boss of all the Vaupell and García operation. He asked me if I could accept Arguelles as my boss and I said, "Of course." He was older, he had more experience, he was a man highly appreciated by all of us. That lasted for a lifetime. We worked together for a lifetime. But I did manage to tell García, "Okay, if he doesn't take it I want it by the end of

the year." And he said, "No problem." He thought Arguelles would take it.

So in due time I took some vacation, went to see Arguelles, and Arguelles said, "I don't want the job. You take it." So I came back and waited for my deadline. The deadline was December 31. And since García did not react to the commitment I resigned.

M: We're going to skip in time now and talk, again, about some of the activities you had when you were working as an independent consultant.

T: Yeah, the consulting part was relative because I was really directing my boys that had been left at Peñoles in their mining division. They had worked with me all their professional lives. They were used to having me tell them what to do, so in a way I was still running their mining division.

And the Fundidora position was a managing position more than a consulting basis. There was some, of course, activity as a consultant, mostly in judging managements' projects. Actually, my expertise was in mining...mining, milling. And, of course, we had had the smelting experience in Peñoles. We had the smelting experience in Lower California, both in El Triunfo and Rosalía, so my experience was pretty well-rounded.

But, really, actually, I was managing from my office many operations. Now, what made it interesting was, to round that out, I had a pen from Minera Autlán with three diamonds on it

that says, "Thirty-five years of service." And I was never an employee of the company not one day. I was an advisor to the young man that made the company and ran it for all those years and taught him to be a miner, more or less, but that's one case: thirty-five years service without having been an employee. I was never an employee for the other, either. I was never an employee of anyone after leaving Peñoles. I've been independent ever since. I still am.

M: But you, also then, in those years when you were an independent you were involved in other mining operations, like you eventually went back and worked for Nukay.

T: The independence gave me the liberty to invest and, I would say, with today's economic situation, comes not from the managing fees, but from having made some lucky investments, some of which you can see on the wall here.

M: What particularly sticks in your mind? Because you went back and worked at Nukay, for example, didn't you?

T: Oh, yeah. That comes later. But, you know, some of the developments that are worth mentioning... . I was in charge, or we were in charge, my division was in charge, of the exploration of the Hercules Iron Mine. There had been two unsuccessful drilling eras on interesting outcrops in the middle of the dessert in Coahuila far from everything, far from any source of water...nothing but nine little outcrops. The best-looking ones had been drilled on two occasions unsuccessfully.

We were lucky, again, and our drilling picked up the number nine outcrop that eventually made the first Hercules Mine. We were lucky in the exploration. We developed that operation in the middle of the dessert, built a nice camp. A miner very seldom has an opportunity, a small miner, especially, to say, "I'm going to build a camp for a mine that will be working in the next century." Very few miners at the early stages can say, "This mine is going to be working in the next century." So we usually don't plan. We make a camp for the minimum requirements. Now, there, we planned for a mine that was going to be working. Today, the mine is producing and shipping through the longest ferro duct: two hundred and some kilometers long, about a million, eight hundred tons of iron concentrates from that little mine that we developed with five million dollar investment. Of course, five million dollars...they were big dollars, not the little ones of today.

M: Approximately what year was that, Sal?

T: Beg your pardon?

M: What year was the development of Hercules?

T: Oh, must have been in the early [19]70s. There's a picture of the first pit...that second one. (points to photograph) Another project is the next picture there. We built a beautiful mill in Durango for the Cerro Mercado operation. It's still a beautiful plant and a very efficient one...very modern in those days. That cost a little more than five million dollars, but it was worth it; it's reactivated and

working beautifully today. They have made some improvements, of course, after four or five years.

M: Now, the iron projects at the time when they were developed, was the government involved in the iron business at that time?

T: No, no, no.

M: This was private?

T: They had nothing to do with it. This was Fundidora.

M: Oh, okay.

T: This was Fundidora's projects. The reason I say I made them because I was running their raw materials division. Those two projects were very nice. (points to photographs) You can see those pictures. Of course, there's five or six other operations that started from nothing. Hercules started in the desert. We rented a ranch house about twenty miles from the drilling, twenty kilometers from the drilling, because it had a windmill, I think you call it.

M: Windmill, sure.

T: You've seen them up there everywhere now. And it was hauling up a little bit of water, which was never enough for the drills and for the drillers for the diamond drills, so we were limited to the capacity of the water. And to think that today that desert is providing the water to pump a million eight hundred tons of concentrates. That same desert is providing the water to pump.

M: In a slurry pipeline?

T: That's right. The same desert couldn't provide enough water

for the drills. But then that's mining; you have to live with whatever you can get. Those were interesting years.

And you would like to talk about- we were involved with the barite mining that is in Apatzingan, La Compañía Minera Apatzingan, La Compañía Minera Apatzingan, S.A.. It was a prosperous little operation. That company, in these explorations, developed the present-day mine of Peñoles, La Minita, in Colima. We developed that years later when Pedro Sánchez Mejorada was director of Peñoles. He and I went to visit Peñoles...beautiful camp, very nice operation, open-pit operation.

And the young geologist that was assigned to give us a report on the history of that nice unit made the mistake, or didn't know who he was talking to, and he gave us a lecture of how they had found the deposit. After his talk I told him, "And to think that I rode a mule one and a half days to decide if this road was to be built (chuckles) twenty-five years ago." And then Pedro, who was his direct boss, said, "And to think that Treviño and I spent a night in a station wagon stuck in the middle of an arroyo when we came to see these possibilities of this being a zinc mine. And here you found the mine twenty-five years later." Well, this is a story, but that's mining. Nobody ever is the discoverer...nobody, ever. There was always someone before that looked into it. We were not the discoverers of anything. We might have been the developers, but not the discoverers of any mine...not even

these young fellows with all of their technical geology, much less they.

Now, they were prosperous years, that is, economically. They were active years professionally. Of course, they were years when the facilities were available. I traveled a good many parts of the world to see the mining, other people's mines, other country's mines. It was very good professional years. My wife died in 1970. She died early. After twenty years of being a miner's wife she died. I was happily married to her for twenty-six years, then I was a happy widower for seven years. Now, I've been happily married for twenty-one more years. And I think that happiness has something to do with yourself and not only with the consequences of life.

Well, those were prosperous years, but they did give me the opportunity to invest. I invested in the phosphates, invested in the gypsum mine that we still are stockholders of, this operation, about two and a half million tons a year of export gypsum. We have a big share of the gypsum rock of the American Pacific [coast] and the Canadian Pacific [coast]. And Japan, we're shipping about eight hundred thousand tons to Japan a year. Well, that was a happy investment...lucky investment. All the investments have to be lucky or they're no good. Don't think we've hit them all; we've made our shares of mistakes. I'm writing a book on the mistakes we have made in mining and we have seen made. And I thought it was going to be one volume. It's going to be a hell of a lot

more volumes than that if I ever get to be old enough to write them all. We have made many mistakes and we have seen many mistakes made, but we've hit a few and that's what it takes. That's what it takes. Well, we come to later years, the last, say thirteen, years.

M: Okay. We'll end this tape and then we'll start again.

T: Okay.

End of Tape Three

Side B

Beginning of Tape Four

Side A

M: What were some of the projects that stick in your mind of looking at the list in front of you?

T: Being an independent- you can put that on if you want. You got it on?

M: Yeah.

T: Being an independent gave me the opportunity, and being a miner, of having been a member of many boards of many mines, of many companies, in Mexico, because most of them were run by non-mining boards, so they wanted a miner on the board. And there were very few independent miners. And I was one of them; that's maybe why I was a member of so many mining

boards. That came, also, from independence. Where are we?

M: You were talking about by virtue of being on boards of directors.

T: Yeah, looking at this list of the boards that I've been a member of and the professional activities, all of that was made possible precisely because of my independence. And, of course, the investments have turned out to be pretty good.

Let's come, now, to the last thirteen years, which we were going to talk about...economics. Pancho and I had gotten involved in a, Pancho Romero and I... . Pancho Romero was a young man that had come to work with me when he was still a student trainee and we have worked together for most of our life. That was forty-some years ago that he first went to work with me. He's a graduate of the University of Nukay. He was manager of it for some time.

Alright, now, we had gotten involved with the Peñolita operation in which we tried to modernize a last century process of hyposulfate leach on amalgamation tailings from the Spanish times in Zacatecas. We put up a nice plant countercurrent with continuous operation and fancy precipitation on pressured presses...trying to modernize an old process. It didn't work. We had spent some money of our own, of course. Fortunately, we didn't owe anything. That's a must to survive a failed project...to owe nothing. It fails, it fails. You lost your money, but you didn't lose somebody's else's money that you had to pay later. No debts.

So we decided to go back to the old vat leaching, just like the old timers had done in the last century, and precipitating. (points to photographs) You can see the pictures there on copper scrap...the usual stuff. The price of silver was good. We made money. We regained most of our investment, or all of it, and some more, and a little more. That was alright, but it had put us together again. And one day we were talking about Nukay and we said, "My God. We know what we left." In my time we had mined our stopes to, and I say, well over twelve grams. And since he worked later years, he said, "Well, in my time it was ten grams." So we said, "Well, it would be interesting to go back to that little mine that had been shut down for twenty-five years."

Well, Pedro García had shut her down because the price of gold was pegged at thirty-five dollars an ounce and inflation, of course, through all those years had taken the edge off of that moneymaker and they had dismantled everything. And I said, "Well, there's nothing we can do except talk to Cisneros," who had replaced Vaupell in the association. It was now García and Cisneros. So I called Cisneros and he said, "Well, we don't have it anymore. We don't have anything to do with it anymore. We gave the claim to the fellow that took care of the shutdown unit," he said, "so negotiate with him." So that's what we did.

And then we went back to Nukay. We were lucky, again. We had planned to go underground, open up the old workings

with all the problems of opening an abandoned mine of twenty-five years. And we were doing that when we saw that the miners after our time had taken the waste pit, the open-pit that had produced the fill for the stopes in the limestone, had invaded the outcrop on the surface. We knew that the surface- we had trenched it- it was low-grade for those days and it was of no use to us. We were nothing below twelve grams. We had plenty ore. We mined to twelve grams, so five-gram stuff was no good. But here we sampled the evasion of the skarns and we found we had eight grams right on the surface, or close to the surface, so we forgot the underground operation and started a little open-pit operation. We rented a government flotation mill and we realized that we were making money on fifty percent recovery on flotation, but we were making a little bit of money with eight-gram gold heads.

And that, of course, led us to make the investment to put up a cyanidation plant. The equipment from Peñolita was a good start for the cyanide countercurrent operation. We, of course, had experience. We put up a nice mill and we started this operation quite profitably, so Nukay, again, was taking the *riquillo* off of Pancho and I. We were making pretty good money. We had good partners. All the old fellows in this office were minority partners on this venture. Pancho and I controlled it and we worked it happily enough for ten years until Pancho came to my office one day and said, "You know, I

have been worrying about the payroll for thirty-something years...Saturday's payroll. I don't want to worry anymore." He was running the Nukay operation for us. And I told him, "If you don't want to run it- I was manager of that forty-five years ago, if not fifty- I'm not going to be manager of it again." So he said, "Let's sell it." I said, "You manage it." He did. We had a profitable operation that owed not a penny.

So we had a minority partner who said, "I'll take the risk." We had had an offer by a Canadian company for an option- to take an option to see if they could develop a million ounces of gold out of the outcrops and possibilities. And they had put a price on it: ten million dollars. So we thanked them and said, "No, we don't give you an option. We have assets to sell. We have a profitable operation to sell with no option." So they couldn't go on, but we thanked them because they had put a price on it. So our minority partner said, "Okay, I'll take the risk." He didn't have the money to pay us, but the company could go into debt. So he inherited a hundred percent control of a profitable company, but highly indebted to the tune of the value of our holdings, so Pancho and I were out of it, theoretically. In actual practice Pancho helps them an awful lot because there was some interesting arrangements. One of them was that during... . Pancho, actually, negotiated all the credits, did all the work. He didn't want to worry about the... .

Meanwhile, we were no longer investing. We were no longer stripping. We were making money by downsizing while he was getting ready to sell it, to sell our stock. The company kept on. Well, whatever, that's turned out to be an interesting operation because the fellow that took it over has been associated with a Canadian company that has spent ten million dollars on it. They have come up with a possible good-sized operation, maybe a big one. They're making money; they're milling three hundred tons a day and making money on it. We're happy not to worry about a payroll for so many years that we have had to worry about it. We are now devoted to helping our friends with whatever our experience is worth. I don't charge anybody for my services anymore. I haven't charged for some years. Whatever I could charge for my consulting would not be significant, so all this fuss here, all this office, actually, is my contribution to a profession that has given us plenty. This office here with all the secretaries and all these facilities is run at my cost for the benefit of retired mining engineers, some interns, and some external retired mining engineers, but they all get services at no cost right here at this office. That's the story, briefly.

M: Sal, thanks a lot for your time.

End of Tape Four

Side B

Beginning of Tape Five

Side A

M: Today is June 19. I am in Mexico City at the office of Salvador Trevino. Now, this is a follow-up interview to an earlier interview we had March 5, 6 of this year. I wanted to ask Ingeniero Treviño some questions about his experiences during the years he worked with the government. Sal, thanks, again, for your time. Let me just ask you kind of a follow-up question to an earlier interview. You were General Manager for Comisión de Fomento Minero from 1953 until 1966. Could you give us a little bit more background about that experience? For example, what was the history of Fomento Minero prior to when you became General Director in [19]53?

T: Okay. I was the fourth general manager of the Fomento Minero. Fomento Minero was founded as part of the Mining Law of 1931. It was meant to- *fomento* means to foment...I imagine there is such a word in English- to promote the mining industry, to help the mining industry, especially the small and the medium-sized miners in the country. It started out poorly funded as most government things go, but the same law that gave birth to the Comisión established the national reserves. And those national reserves were turned over as a patrimony to the Comisión.

In my time we began to develop the sulfur fields in southern Veracruz, the southern part of the state of Veracruz,

actually, which began to generate good royalties and gave the Fomento a nice economic position that it had never had before.

M: Now, was Fomento Minero actually directly involved in the development of sulfur in those years?

T: No, it was the landlord. The national reserves were contracted out to private initiatives that developed the sulfur fields. But the royalties were a nice income that gave a great deal of strength to the Comisión simply because 'Who pays, commands' and since the government never gave us any money, they didn't command us. They didn't tell us what to do. We generated our own income. That was the strength. That was the real strength...all based, naturally, on the exploitation of the national reserves.

Now, the philosophy in my time was that the Comisión did no mining. It had a few plants. We passed them over to private initiative. We were private initiative fans before everybody else. Now, everybody does it, but in those days we were the ones to begin. We got the Comisión out of the mining business. We were out to promote the mining business, not to take it over; that was the philosophy of my time in the Comisión.

Well, by that time there was a great deal of pressure against the foreign-owned mining companies. Mexicanization of the mining industry was a very strong movement because it has been said that "All abuses bring an abusive reaction." And that's exactly what...the abuses of the foreign companies for

a hundred years had caused a lot of problems.

M: A couple of questions. How would you characterize the principal abuses of the foreign mining companies?

T: They never allowed a Mexican to ever be anything in their companies. The Mexican mining engineers, as high as they could get was to be chief engineer. They were actually topographers [surveyors]. And that was only one of the many things. Whatever, they had generated a poor public relations situation. Why discuss the how. That's the result, so there was this pressure to Mexicanize.

M: Now, let me ask you this. Now, when you say there was pressure, was that pressure mainly within just government or was it generally within the business community?

T: It had been growing with the years. This effect, this bad relationship with the...

M: Mainly within the government?

T: With the government. And not only with the federal government. Their public relations were very poor.

M: One other question, now, Sal, in regard to that. Was the majority of the nationalization, or Mexicanization, sentiment... (taping stopped and started again) My question was, was the sentiment for some sort of nationalization or Mexicanization, was that directed primarily toward resource companies, primarily toward the mining companies, or was it something toward all foreign investments?

T: Mining. What we were involved with was in the Mexicanization

of the mining. There may have been a tendency of other industries, but mining was the great example of total foreign control.

M: Was the main focus of international...

T: And, of course, there is a tool. Who said that "The power to tax is the power to destroy"? And that was a tool that was used. It was very costly to the mining industry, but very effective, to Mexicanize it because high taxes brought along so-called subsidies, wrongly called subsidies, which were nothing but tax reductions, which is very different...a tax reduction from a subsidy. But they called it subsidies that was given to the Mexican-owned mining operations. That was, of course, a killer to the foreign-owned companies. They had to Mexicanize.

It was quite successful. It took years at the expense of the industry. Exploration was shut down in many of the mining camps. And we all know what the result of stopping exploration is in the mining business. So it was all pretty much down. But Mexicanization...the Law of [19]61 made it official, made it obligatory, for Mexican control of all mining companies.

M: But not just mining companies. That [19]61 law applied to all foreign...

T: No, no, mining.

M: Just the mining?

T: Just the mining...obligated. And the chairman of the board

had to be a Mexican and all of the things that we saw up to the last few years that that has been changed.

M: Now, one other question. Was there, also, sentiment within the government at the time for something more than Mexicanization? Was there serious discussion of nationalization?

T: There was a tendency, but nothing ever as drastic as was done with the mining. It actually attacked the mining industry with a mining law. The mining law attacked the foreign ownership of the mines.

Now, here comes the consequences of government action. There was a nice push towards development of the mining industry once it slowly Mexicanized. There was a great psychological...and it really began developing, but it took the government eleven years to eliminate the punishment that had been invented to Mexicanize it. It took them eleven years to eliminate the damn so-called subsidies and the high taxes, so they continued to punish the industry because of fiscal reasons. They needed the money. That was very, very, very expensive. That was very expensive money because it kept the industry from growing. Surely, in those eleven years, the Mexican industry could have doubled its production if it hadn't been for that punishment.

M: And that was primarily in the form of just what you would call excessive taxation?

T: Naturally. "The power to tax is the power to destroy".

Somebody said it and they were sure right. This was used. That's pretty much the story.

Now, the Mexican mining industry developed considerably strong. The mining schools multiplied. The mining profession, the mining engineers, well, the Mexican ones, took over the running of all the companies and, as it turned out, we had some very good years. They coincided with good prices of metals that have a hell of a lot to do with the prosperity of mining, as we know, and the rest is history. It slowed down when the metal market prices began to go down, but it had given a pretty good push to the mining industry in Mexico... mostly the industrial minerals and the non-precious metals: copper, lead and zinc were the bases. Silver always, of course, very little gold; Mexico has not been a gold producer.

M: During the years when the government in the [19]50s were trying to decide what to do about whether to Mexicanize or to nationalize, who were the champions of Mexicanization and who were those that were opposed to Mexicanization or favored Mexicanization over nationalization?

T: That's an easy question. Everybody in the mining industry in Mexico was for the Mexicanization of the mining industry except the bosses of the foreign mining companies, some of which we know, from experience, were pretty dictatorial in their ways. Mining companies have not been famous for being great distributors of wealth anywhere or leaving much. That's

been one criticism of mining not only in Mexico...everywhere. We can take a district, like San Francisco del Oro, that for two hundred years produced hundreds of millions of dollars of profits. And just look at the town that they have generated; all those millions of dollars haven't been left in that town. That was one of the criticisms. The Mexican companies did a little better job, considerably better job, in their public relations...improved the relations of the mining industry with their local, especially with the local, communities. They did a much better job than the foreign companies have done.

M: But, now, Sal, even though mining companies may have not done a lot for local economies, isn't it true in the taxes that they paid through those years that they were a major contributor to tax revenues in the country?

T: Of course, they were very important. The mining activity developed most of the big cities of Mexico. There's no question about it, but we're talking about that period. Then we ran into the period of nationalization of the mining industry which, of course, was entirely a different battle. One thing was to Mexicanize the mining industry and another thing was to nationalize it. That's about the time I left [government work] because I wasn't going to get anywhere in an atmosphere where I was against the government intervention.

M: So this would have been in the mid to late [19]60s.

T: The [Luis] Echeverría [Alvarez] times.

M: Okay.

- T: They, [the Echeverría administration], were out to nationalize, not Mexicanize. We had Mexicanized the mining industry, but little by little they started nationalizing by absorbing. They didn't expropriate. They bought or, especially those companies that were not doing well, they managed to get to them through loans that they couldn't pay and eventually took them over. Whatever, it came to where thirty-something percent of the mining industry was in the hands of the government. Those were pretty difficult years for the mining industry because they ran into that tendency.
- M: But, now, during that period there were certain industries that the government sought to control completely like the iron part of it.
- T: Yes, well, that was...
- T: Now, was that part of the same nationalization?
- T: Sure, we were talking. This fellow that will be coming in at one o'clock, he was general manager of Fundidora. That was taken over through labor pressures. They managed to generate labor difficulties for the company. When they went after something they had a lot of tools, a lot of means to take them over.
- M: So tell in a little bit more detail how Fundidora de Monterrey, as an example, kind of fell into government hands.
- T: Five strikes in which they were obligated to pay all the unworked wages. Well, of course, that degenerated the whole union. Simply, they got used to getting paid without working.

Well, that eventually killed the company. There's a lot of tools. "The power to tax is the power to destroy."

M: So, then, the Mexican government actually took managerial control of Fundidora?

T: Of course, took it over.

M: Were the owners compensated?

T: No, no. The government came in to help them. They took it over through capitalizing. They needed a loan, they could get a loan, and when they couldn't pay it back they would, naturally, get a higher percentage of stock until they had control.

M: If you look back on those years, now, Sal, do you think that was a policy that the Echeverría administration had set out? Was that an objective they had from day one?

T: Definitely, definitely. What's more, it was very openly done. Well, they managed to have thirty-something percent of the whole industry; they had taken over Cananea, they had taken over all of Fundidora's mining operations. I was the director of all the mining operations of Fundidora.

M: The government controlled whole industries; they controlled the iron industry, they controlled phosphates, they controlled coal, they controlled sulfur. Were those commodities that they had specifically chosen or were those just businesses that allowed more easily the government to get into?

T: It's just like all government things. It's a many-headed outfit. You can't put your finger. You put your finger on

one, it disappears, and another one comes up and so you can't generalize. There were worse nationalizers than others, but all had to make a living and they went along with whatever the government's policy was. And that's what it was; it was nationalization. Until, of course, now it came to an end some years ago with a complete change of the law and which not only eliminated the nationalizing tendencies but, also, the Mexicanization. It eliminated all the clauses that gave preference to Mexican-run operations and opened it completely. That, of course, is not only in Mexico. That comes from the opening processes in the world.

M: What happened to various government agencies like Fomento Minero during the years?

T: Fomento Minero...when the downsizing tendencies in the government, which were entirely different from previous nationalization policies... . One of the things they managed to do was practically kill Fomento Minero. It used to be a bank of the first floor, that is, would deal directly with small miners and medium-sized miners...finance them directly. Now, they eliminated that. It has to work through a first floor bank. They put up the money through the banks, which is responsible for the debt. That pretty much finished the financial activity of the old Fomento that was very, very useful to small miners and medium-sized [miners]. It had been a great tool to develop the small mining industry.

M: There was a period when it was relatively easy to get

financial help from Fomento Minero.

T: Absolutely.

M: That would have been when? In the [19]70s? In the [19]80s?

T: No, no. Well, [19]60s. In my time if somebody convinced me he'd come out of the office with a check in their pocket.

M: But then, later, though it really got to be complicated.

T: Later on it was committees, committees, and a lot of geniuses had to intervene. They didn't know the mining industry. Look, as long as we had no federal budget we had to generate our own means, which we did quite successfully. We had no competition for the top public government jobs in mining. They were all in the hands of mining engineers. When big money started coming, easy money started coming, then they eliminated all the mining engineers in the government because lawyers and economists and whatnot, they were good plums. They were nice jobs with quite a bit of easy money to spend. In my time we had little money to work with and we had to generate it ourselves and we had a lot of clients. And we knew the mining industry and we knew who to lend it to. We had a very unusual record for any government thing...to have a tremendous recovery rate, but they got pressures. The World Bank would bring millions of dollars available to Fomento to lend to few miners, a lot of money to few miners...to all of them, actually. It was easy to get hold of financing, but it doubled the bureaucracy and it multiplied by ten the time required. You not only had the natural bureaucracy of the

Comisión, but you had the World Bank's bureaucracy, which is just as bad. It all ended up in practically killing almost all the small miners in the country, the small mining businesses in the country, and a lot of the medium-sized ones.

M: How did that happen? Why did that happen?

T: Because Fomento would take so long. Fomento, with a lot of easy money behind them, would look at a project...a small miner that wanted to put a two hundred-ton plant. And he'd come with the budget and they'd tell him, "Okay, you have to put up one-third of it. We'll give you a loan for two-thirds of it."

End of Tape Five

Side A

Beginning of Tape 5

Side B

T: You got it?

M: Yes, sir.

T: And, of course, the result was that they would spend their money to start the plant and it would take a year to get the money that was worth...remember, the times of inflation. The money was worth half of what had been negotiated by the time they got it and they got it too late, actually broke many a

miner with that easy money, relatively easy... . We would put question marks on that easy money. It was late money and inflation-prone. In times of high inflation...

M: Were the interest rates pretty high, too, on those loans?

T: No, it was soft credit. It was alright if they had been efficient, but they couldn't. You know, they'd have to go through all the bureaucracies and, besides, it was no longer run by miners and, what's more, it was a government-run operation simply because the government was putting up the money. That was pretty much the story for the Comisión. They've done away with it. You know, with the opening up of the economy in every sense the national reserves have been-- how would you call it-- eliminated. And that was the basic strength of the Comisión.

M: In regard to the national reserves, Sal, you mentioned that the Mining Law of 1931 established the national reserves. Was that established just for commodities or did it, also, authorize the establishment of national reserves over specific areas?

T: Both, both, but mostly commodities. It started out mostly commodities, then it was specific areas. The policy wasn't bad. It's the abuse of any policy that's bad. And, again, "All abuses bring an abusive reaction."

M: What about the history of another agency of the federal government, Consejo de Recursos Minerales?

T: Okay. I was the second director of that. (chuckles) It was

the exploration branch, a somewhat weak copy of the U.S.G.S., [United States] Geological Survey.

M: Now, an exploration branch of just the government or of Fomento Minero?

T: No, no. Of the government. It was an entirely different...and government-funded. That was different because it was government funded. And in the good days of the Comisión it was not government-funded. And the Consejo was government-[funded] and, consequently, government-run.

M: What year was Consejo begun?

T: I was still there. I'm going to guess at 1960, [19]58, [19]60. I was director of it for one year only because that was at the same time I was director of the Comisión, or general manager of the Comisión and, at one time, Director of Mines...all three at the same time. It was only a short period, but my appointment there was temporary. It was for a short time. Evidently it wasn't my field or my expertise, so it was temporary for me. But it did a lot of work, has done a lot of work. It's doing a lot of good work.

M: Well, it started out more, as you say, it generated a lot of information in the early years. Is that right? They weren't really directly involved in exploration in the early [19]60s?

T: No, no. They did the basics for... . They didn't do the commercial geology. They, actually, started working on the geological maps, took over the geological maps, that had been started by the university. The geological branch of the

university had started making the geological maps...the first very primitive. And the Consejo has worked on them and has done much better work. It has done a lot of work and for years, being government-run, for years it was obviously inefficient. Those two things seem to go together: government and inefficiency, whether it's Washington, Bonn, or anywhere. And they did a poor job of following through, making it available to the miners who should have had better access to all that information. They spent a lot of money compiling and making some rich files, but very impractical help to the mining industry. They're doing much better now. That agency is working well.

M: So when were the years when the Consejo de Recursos Minerales was primarily involved in exploration?

T: All the time. It has always been involved in exploration.

M: The big reserve areas, for example, when were most of those established, like the big federal reserve in Sonora and some of those areas? That dates from when? The [19]70s?

T: Yeah, that would be in the middle [19]70s because of... . Let's see, there was a joint program with a US agency or world...United Nations agency is what you have in mind. They did some good work. That joint venture really worked. They came up with the Caridad [Mine], they came up with others. That was direct exploration and successful. It's a major copper deposit.

M: Their other big success is going to turn out to be this

Francisco Madero deposit just outside of Zacatecas.

T: Yeah, north of Zacatecas.

M: A discovery that they made.

T: Well, that's pretty much the story. They have not killed the Consejo; they have strengthened it. They did enough damage with killing the Comisión de Fomento Minero.

M: How do you see the future for the Recursos?

T: The future for what?

M: For Consejo de Recursos Minerales. Are they completely out of exploration now?

T: They are not doing any commercial geology. They're doing much less. In times of nationalization, of course, they had a tendency to be a geological arm of the policy, but not today. They're pretty much working for the industry, not to take it over. They are opening up just like they have in every other aspect. World tendencies have a lot to do with what's going on.

M: How would you assess the general policies and politics in the thirty years that went on from the late [19]50s up until the Mexicanization was canceled, Salvador? First of all, do you think that it was really that unique to Mexico or that sort of sentiment was kind of world-wide at the time?

T: Nationalization was not only a Mexican policy. It was true of many mining countries: Bolivia and Peru and Chile. They were all nationalistic. It was a world tendency. It was a world tendency. And, so, just like today, it's the opposite; the

world tendency to decentralize and to throw everything to private initiative, which is what they're doing.

M: Overall, how would you assess the period in that thirty years when Mexico went through Mexicanization? Was it good for the country you think?

T: It was very good for the mining industry. It was very good for the country, too, because it developed the mining industry that was pretty much degenerated. It was in a slump caused by high taxation, of course, and difficult times. Remember, we're in a cyclical industry. Would you call it cyclical or cyclical? One of the other, whatever. Good prices, good times; poor prices, poor times. There's no question about it. The local and national policies affect those periods, but the market affects it more than all the national policies. Now, of course, we have environmental problems beginning to hit the mining industry. And we can learn from very, very poor examples of what they're doing to the mining industry in the United States and in Canada. Why are all the Canadian companies exploring all of Mexico and not exploring Canada? But there's just a lag. It's just a matter of time; we'll catch up with all their mistakes.

M: You mentioned in the years before Mexicanization when the foreigners dominated much of the mining business in Mexico and in other countries there was this general abusiveness. Do you think that that's something that will happen again as foreigners move into countries like Mexico?

T: No, no.

M: Why or why not?

T: I'll tell you why. There had been no mining experience allowed by the foreign companies. The Mexican mining engineers were surveyors. Now, [after] Mexicanization, up to the top jobs, all the top jobs, all the technical jobs, there are dozens with master's degrees and doctorate degrees now than before. There was no use to have a doctor's degree to run a transit. Now, that will be different. Besides, where can you duplicate the underground mining experience that the Mexican miners have? Where are your underground miners? You've got so few. Are you going to export the few that you have? The Canadian underground miner...nonexistent. You can not export like you used to when you had the monopoly on the experience. You no longer have the monopoly. You don't have the miners. Look at your mining schools. So, I'm all in favor of what they're doing. Open it up. The country has to compete in mining, has always competed, in the market. It has never been a subsidized industry. It has been a taxed industry as it has been everywhere, not only in Mexico, but it's certainly not a subsidized industry or a protected one. It's a taxed industry. It has always competed with the world mines. It has never been protected, so the mining industry hasn't suffered [by] this opening up because we've always been open as far as competition in the markets is concerned.

M: Let's change the subject a bit.

T: Sure.

M: I'm interested in some of what you remember about some of the real significant new discoveries of mines and mineral deposits in Mexico that have gone on in your professional career.

T: Okay.

M: One that comes to mind would be of the discovery of the Fresnillo Company of the Santo Niño vein.

T: The New Fresnillo.

M: The New Fresnillo.

T: It's not the Santo Niño vein.

M: Could you provide some detail about that, please?

T: Yes, I could tell you the story. Didn't we go in to that last time?

M: Somewhat, but I'd like to hear a little more detail.

T: Okay. Fresnillo was wholly owned by the Fresnillo Company in New York in the years previous to Mexicanization. It was run by a very effective manager, Mr. Rose, Hugh Rose, very effective manager, and he ran it but, as usual, like happens to all of us, he got old and Mexicanization came along. And Peñoles Mexicanized it because they needed the concentrates, the Fresnillo concentrates, in the Torreón Smelter, so they bought a company that had only one good mine and one dog, Fresnillo. It was a losing proposition. And Naica was a profitable one. They bought it because they needed those concentrates. Peñoles...we bought it. I was a member of the board of Peñoles at that time. I was not the director

general. I was just a member of the board in those days.

Well, whatever, it was Mexicanized by Peñoles. They had control; it was fifty-one forty-nine. Eventually, Peñoles bought the other nine and it was sixty-forty. And it continued to lose money. The president of the board was Don José García of the Fresnillo Company. And, believe it or not, the executive committee of the company, all five of us, were miners, but mostly... . But one of them, a good friend of ours, good miner, too, he had been the general manager of Fresnillo before Mexicanization and he had no faith in the mine or in the district. Year after year he would bring up the liquidation of the Fresnillo unit. And he was always taken to the executive committee and his request was always turned down. He represented forty percent. That was a hell of a representation. He was a Canadian, damn good miner. He was killed in an airplane accident at one of our mines, good friend. Whatever, he always insisted on the liquidation of that district, of the Fresnillo unit. And the old boy, chairman of the board, he would say, "How much did we lose that last year that you're talking about?" "Oh, we lost so many millions, a few million pesos." And he'd say, "It's elephant country. You keep looking." Now, tell me how many companies left anywhere run by lawyers and accountants would come up with that decision. He, of course, was a miner. Now, José García was, of course, a mining engineer. He was a miner. "Aw, it's elephant country. You keep looking."

M: Well, the situation at Fresnillo had gotten somewhat desperate from a reserve standpoint, hadn't it?

T: It was terrible. It was mining five-dollar rock at a thousand meters deep. Miserable! It had developed... . This is what makes it interesting. The general shaft, which was the hoisting shaft, was here. To the southeast the longest working from that shaft was two hundred meters; in the other direction it was eight kilometers. And all the deep levels were going in the opposite direction of the New Fresnillo. But, what happens? What was masking all the possibilities of exploration? There was forty million tons of tailings to the southeast. So since our Canadian partner- he was Canadian, the company was American- our friend in the executive committee, says, "Okay. Well, let's have a geophysical study of the whole damn thing before, so if nothing comes up, shut her down." So that we agreed to. It was done. Five targets came up. It took six months for each of those targets to prove nothing, to find nothing.

So, eventually, Ken Lauder, the chief geologist for the company... . They had a younger geologist in Fresnillo by the name of Vásquez. So Vásquez called up Ken Lauder and said, "Well, what do we do now? We've finished drilling the fifth target and found nothing." He said, "Look at one of the plants there where we have the possible extension to the southeast." He said, "Well, but what can we do? We've got this big pile of forty million tons of tailings." And he

said, "Well, go to the other side of the tailings." "That's a kilometer!" "Well, go to the other side of the kilometer and start drilling there."

And what did they find? A bunch of little stringers, with damn little grade, and the deeper they drilled...their machine would go down to only three hundred meters. It would take quite a while to [drill] each hole. And then it'd go fifty meters always following wherever they found more of the stringers. So they began locating, locating, locating...and more stringers, a little wider. They were no longer one millimeter, they were two millimeters wide and the grade wasn't ten grams of silver, it was fifteen. So they kept going...fifty meters, fifty meters, for a couple of years. And the old man said, "Well, it's elephant country. You keep looking." With nothing but the old-fashioned sense since all the geophysical work had failed.

So what happens? Ken Lauder gets impatient and he tells Vásquez over the phone, he said, "Don't go fifty meters"- because he's reporting another one. "What did you find?" "Well, more stringers, a little better grade. Nothing to write home about." He said, "Go two hundred meters beyond wherever you think the stringers lead you to."

So Vásquez goes out to the field and he measures out two hundred meters, but there was a creek about twenty meters more, so instead of drilling two hundred he went to drill at the bottom of the creek. And there he hit the Santo Niño

Vein, which is the longest ore chute, the longest and the biggest silver-bearing ore chute ever found in the country. And it's not the New Fresnillo; that's just the vein that was found...the discovery. If he had not gone to twenty meters... his machine was able to cut the top. The veins were there, but they had been fingered out. The reason that no exploration had been done in that way is because they would be running into this horse-tailing of the vein. They were above. Naturally, with the deepening of the mine to the northwest, with the deepening of the mines, it was done through interior shafts far from exploration possibilities over there [to the southeast]. So there you have another humbling experience of your business.

M: What about some of the other major discoveries that were made in the last thirty or forty years?

T: Hercules, Hercules. There had been two drilling programs: in the [19]20s and in the [19]40s. In my time, in the early [19]60s with Fundidora, I used to run all their mining companies from my office, but I was never an employee. I ran it from my personal office. I used to run their whole raw materials division from my office with no big bureaucracy of a big company, so we were a very efficient division with no overhead, or practically no overhead. Well, anyway, we were beginning to worry about Cerro Mercado running out of high-grade ore, not running out of ore. We were running out of high-grade ore. The big ore body had provided all the iron

ore the country had needed for seventy years, so there was no great pressure to do any iron exploration and, besides, Hercules had been reported. During the war a big survey was done for all the strategic minerals and Hercules was reported a possible two million tons of iron ore, which is no iron mine. But two drill periods had drilled the best outcrops. There were nine outcrops. They had found nothing in the number one, number two, number three, and they quit. If the best ones didn't have anything underneath, well, that's all. Then a second one had drilled four, five, maybe six, so we had, for our period of the drilling, we had the leftovers.

And we drilled number nine and really hit it- another humbling experience for your profession- with no water at a hundred-mile radius. A hundred miles from us there was no water in the desert. Now, that desert is supplying the water for the ferroduct, the longest in the world, two hundred and thirty kilometers to the steel works [in Monclova], and it's providing the water to pump it. That's a humbling example for your profession. Enrique Prado, a Texas Miner, was the guy that solved the problem of the water.

M: And what was the solution? Did they just find a big well field? How did they develop the water?

T: We had drilled five holes down to a hundred meters to pump about one liter per minute...one little liter with all five of them.

End of Tape Five, Side B

Beginning of Tape Six

Side A

T: They have now developed. They have mined many millions [of tons] and they're still reporting a hundred million tons.

M: But you were going to say how they solved the water problem.

T: Yes. There was a dry salt flat about sixty or eighty kilometers from there, sixty or seventy, so Enrique devised...

. And, of course, there was never, except during the rainy season, there was a little water on the surface, but it was salt water. Like there's hundreds of salt basins in the dessert. So they drilled. What he did was to drill halfway between the salt flats and the mine and, actually, came up with water that was half as salty as the one in the underground lake, but he had water. Now, when there is no water, a little bit of salt doesn't scare anybody.

Following all the scientific basis of your business he drilled another hole halfway between that hole and the mine and he came up with water with less salt. Now he almost had a workable supply of water for future treatment, so he drills another hole deeper, every time deeper, and he comes up with less salt. There, he was close enough to equip that well and pump it to camp. Then the mine, believe it or not, the open-pit mine, started making water one fine day and gave us a lot of trouble and we had to pump it out. We didn't want to. It was a problem because we didn't want it dry...that water from

the fill in the valley. And the damn water was giving us all kinds of trouble at the bottom of the pit because we didn't want to pump it out. We didn't want to pump it dry. We kept the water just below the working level when we worked on the lower level. It happens many times that we don't want to pump the water out of a mine. We don't have any other, so what they're doing now I really don't know; it's been more than twenty years since I had something to do with that. That was applying all the scientific knowledge we had learned from Dr. Quinn and Speedy Nelson.

M: One final question.

T: Yes, sir.

M: How would you respond to the question of what do you think the influence, or the impact, in Mexican mining was of the Texas Miners, those that graduated from the Texas College of Mines?

T: Very important, very important. When Mexicanization came about the country needed a dozen miners to be the bosses of the Mexicanized companies. We had to substitute the foreign big bosses. The few stayed with us, they were always welcome to stay, but a lot of them just moved with the bigger companies to other places. They went to South America, or whatever, but a few of the Texas Miners had moved out of the surveying field and were running the smaller mines of the foreign companies way off there, you know. They didn't like living in the sierras so they sent their Mexican engineers. The Texas Miners were the few who developed the mining, the

actually mining experience. That's what we had done, so when we had to staff twenty companies, the Texas Miners were right there with the experience even though... .

And we all came from small management because bigger companies tend to make specialties. I fight that with the young fellows today. The young engineers are specialists. This guy works five years in the stope. Is he ever going to be a mining engineer? No, sir. He's going to be a stope engineer.

So we found ourselves busy running the new companies and Texas Miners were doing quite well. We were not the only ones, but the Texas Miners, we had the command of English, which was a lot of help technically to keep up with literature and whatnot. We had that advantage, practically none other. We were no different. We had more experience. And, remember, we had been a product of the Depression. That had made a work ethic that was highly developed. No welfare then. You had to work for your bread. Everybody had to work. That work ethic was a big, important factor with Texas Miners.

And then our policy of getting our master's degree, working as miners in the United States before we came to Mexico. I worked for one year at Wagon Wheel Gap and I came [to Mexico] being quite a damn good miner with a pick and shovel. That, of course, had to distinguish us from others with just surveying experience. It was an opportunity for Texas Miners. A lot of us had gone through that post-graduate

studies...hard labor. That's the truth.

And there's no question about it in that period that a lot of Texas Miners were in important positions in the mining business. We're fading out, naturally. Texas Mines faded out. This fellow you're going to talk to when we're finished, Ruperto Aguilar, he was one of the last Texas mining engineers to graduate. He graduated after the war. During the war the school had come to practically nothing. And there was, I don't know, two or three of them graduated- he'll tell you about it- in 1946. They'll have their fiftieth anniversary this year. The last of the Texas Miners. The geologists continued to [graduate], but miners, mining engineers' degrees... . So you'll talk to them.

But the answer to you, there's no question about it. There is another characteristic about Texas Miners; we were great friends and great allies. We helped each other even though we didn't work for the same company or the same district, but we would get together every two years at the mining convention. We would get together, take a picture. Our wives were friends and it was quite a very friendly and kept-in-touch community. We were very, very loyal friends to all Texas Miners...a few of us, whatever there was, and we are now fading out. Here in this office is the last of the survivors. We'll be here for a year or two, I guess.

M: Sal, thanks very much for your time, again. I appreciate it.

T: Well, you know, it's good to talk to you.

End of Interview