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University of California
Berkeley, California

Western Mining in the Twentieth Century
Oral History Series

Lewis L. Huelsdonk

MANAGER OF GOLD AND CHROME MINES,
SPOKESMAN FOR GOLD MINING, 1935-1977

With an Introduction by
Philip R. Bradley

An Interview Conducted by
Eleanor Swent
in 1986

Since 1954 the Regional Oral History Office has been interviewing leading participants in or well-placed witnesses to major events in the development of Northern California, the West, and the nation. Oral history is a modern research technique involving an interviewee and an informed interviewer in spontaneous conversation. The taped record is transcribed, lightly edited for continuity and clarity, and reviewed by the interviewee. The resulting manuscript is typed in final form, indexed, bound with photographs and illustrative materials, and placed in The Bancroft Library at the University of California, Berkeley, and other research collections for scholarly use. Because it is primary material, oral history is not intended to present the final, verified, or complete narrative of events. It is a spoken account, offered by the interviewee in response to questioning, and as such it is reflective, partisan, deeply involved, and irreplaceable.

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ACKNOWLEDGMENTS

Special thanks are given to the following friends of Lewis Huelsdonk who contributed to the cost of producing this oral history.

Philip and Katherine Bradley

Mrs. Ian Campbell

James Jensen

Gordon Oakeshott

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Lewis Huelsdonk reporting on gold conference

PREFACE

The oral history series on Western Mining in the Twentieth Century documents the lives of leaders in mining, metallurgy, geology, education in the earth and materials sciences, mining law, and the pertinent government bodies. The field includes metal, non-metal, and industrial minerals, but not petroleum.

Mining has changed greatly in this century: in the technology and technical education; in the organization of corporations; in the perception of the national strategic importance of minerals; in the labor movement; and in consideration of health and environmental effects of mining.

The idea of an oral history series to document these developments in twentieth century mining had been on the drawing board of the Regional Oral History Office for more than twenty years. The project finally got underway on January 25, 1986, when Mrs. Willa Baum, Mr. and Mrs. Philip Bradley, Professor and Mrs. Douglas Fuerstenau, Mr. and Mrs. Clifford Heimbucher, Mrs. Donald McLaughlin, and Mr. and Mrs. Langan Swent met at the Swent home to plan the project, and Professor Fuerstenau agreed to serve as Principal Investigator.

An advisory committee was selected which included representatives from the materials science and mineral engineering faculty and a professor of history of science at the University of California at Berkeley; a professor emeritus of history from the California Institute of Technology; and executives of mining companies.

We note with much regret the death of two members of the original advisory committee, both of whom were very much interested in the project. Rodman Paul, Professor Emeritus of History, California Institute of Technology, sent a hand-written note of encouragement just a few weeks before his death from cancer. Charles Meyer, Professor Emeritus of Geology, University of California at Berkeley, was not only an advisor but was also on the list of people to be interviewed, because of the significance of his recognition of the importance of plate tectonics in the genesis of copper deposits. His death in 1987 ended both roles.

Thanks are due to other members of the advisory committee who have helped in selecting interviewees, suggesting research topics, and raising funds.

Unfortunately, by the time the project was organized several of the original list of interviewees were no longer available and others were in failing health; therefore, arrangements for interviews were begun even without established funding.

The project was presented to the San Francisco section of the American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME) on "Old-timers Night," March 10, 1986, when Philip Read Bradley, Jr. was the speaker. This section and the Southern California section provided initial funding and organizational sponsorship.

The Northern and Southern California sections of the Woman's Auxiliary to the AIME (WAAIME), the California Mining Association, and the Mining and Metallurgical Society of America (MMSA) were early supporters. Several alumni of the University of California College of Engineering donated in response to a letter from Professor James Evans, the chairman of the Department of Materials Science and Mineral Engineering. Other individual and corporate donors are listed in the volumes. The project is ongoing, and funds continue to be sought.

Some members of the AIME, WAAIME, and MMSA have been particularly helpful: Ray Beebe, Katherine Bradley, Henry Colen, Ward Downey, David Higgins, John Kiely, Noel Kirshenbaum, and Cole McFarland.

The first five interviewees were all born in 1904 or earlier. Horace Albright, mining lawyer and president of U.S. Borax and Chemical Corporation, was ninety-six years old when interviewed. Although brief, this interview will add another dimension to the many publications about a man known primarily as a conservationist.

James Boyd was director of the industry division of the military government of Germany after World War II, director of the U.S. Bureau of Mines, dean of the Colorado School of Mines, vice president of Kennecott Copper Corporation, president of Copper Range, and executive director of the National Commission on Materials Policy. He had reviewed the transcript of his lengthy oral history just before his death in November, 1987.

Philip Bradley, Jr., mining engineer, was a member of the California Mining Board for thirty-two years, most of them as chairman. He also founded the parent organization of the California Mining Association, as well as the Western Governors Mining Advisory Council.

Frank McQuiston, metallurgist, vice president of Newmont Mining Corporation, died before his oral history was complete; thirteen hours of taped interviews with him were supplemented by three hours with his friend and associate, Robert Shoemaker.

Gordon Oakeshott, geologist, was president of the National Association of Geology Teachers and chief of the California Division of Mines and Geology.

These oral histories establish the framework for the series; subsequent oral histories amplify the basic themes.

Future researchers will turn to these oral histories to learn how decisions were made which led to changes in mining engineering education, corporate structures, and technology, as well as public policy regarding minerals. In addition, the interviews stimulate the deposit, by interviewees and others, of a number of documents, photographs, memoirs, and other materials related to twentieth century mining in the West. This collection is being added to The Bancroft Library's extensive holdings.

The Regional Oral History Office is under the direction of Willa Baum, division head, and under the administrative direction of James D. Hart, director of The Bancroft Library.

Interviews were conducted by Malca Chall and Eleanor Swent.

Willa K. Baum, Division Head
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Eleanor Swent, Project Director
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Western Mining in the Twentieth Century Oral History Series
Interviews Completed or in Process, May 1989

- James Boyd, Minerals and Critical Materials Management: Military and Government Administrator and Mining Executive, 1941-1987, 1988.
- Philip Read Bradley, Jr., A Mining Engineer in Alaska, Canada, the Western United States, Latin America, and Southeast Asia, 1988.
- Helen R. Henshaw, Recollections of Life with Paul Henshaw: Latin America, Homestake Mining Company, 1988.
- Lewis L. Huelsdonk, Manager of Gold and Chrome Mines, Spokesman for Gold Mining, 1935-1977, 1988.
- Gordon B. Oakeshott, The California Division of Mines and Geology, 1948-1974, 1988.
- Horace Albright, Mining Lawyer and Executive, U.S. Potash Company, U.S. Borax, 1933-1962, in process
- Frank Woods McQuiston, Jr., Metallurgist for Newmont Mining Corporation and U.S. Atomic Energy Commission, 1934-1982, in process
- Samuel S. Arentz, Jr., in process
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* Deceased during the period of the project

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INTRODUCTION by Philip R. Bradley, Jr.

I do not know how long I have known Lew Huelsdonk. It is not, of course, possible that I have known him forever; it is simply that he has been on the mining scene here in California for such a very long time, and so prominently, that it seems so.

He closely represents the typical, most competent type of mine manager characteristic of the important mining community in which I grew up. This was rather typical of isolated mining districts of an earlier day; in those the mine manager had to be a man of high competence and resourcefulness, a man able to handle all the problems that might arise both in the mines and in their dependent communities. Lew Huelsdonk exemplified all these qualities. He was also fortunate in having an experience such as every gold miner dreams of, that of finding and assembling the largest placer gold nugget collection in the world at the Ruby Mine, there in Sierra County.

People do not realize what a complicated life a mine producer leads. For example, some years ago, Lew ran a mine rescue at the Brush Creek Mine, which had two levels. The old level was high on the hill, and the other, low level, was where Lew had built the mill and where most of the equipment was. The upper level had in it, way inside, a shaft that had produced in its time a lot of specimen rock, very high-grade rock, typical of some of the mines up in that country.

Two fellows had a lease on it. They had tracks and a little electric mule to haul in their supplies. One day at the end of the shift they started out of the mine and saw nothing ahead but a gray wall. The mountainside had slid down and covered the whole portal; they had no way of getting out. They had a little dog out there, and there was an old man who stayed around. The dog hadn't gone home, and the old man got suspicious. He took a look at the portal all blocked off and he notified people. The sheriff came and got equipment brought in. But as I recall the story, Lew is the man who took charge. He knew the country and he found a way of arranging communication through a pipe that he had had laid some years before. That was about a two-day affair, but Lew ran that job and got them out.

Lew was all business. One time, Lew's dad had sold a Huelsdonk Concentrator to a man who had an underground gravel mine up near Angels Camp; you can still see the headframe there. Lew was handling sales and service for his dad, and he made a deal with this buyer that the additional recovery that might be made using the concentrator would be paid in to the Huelsdonks (either as part of the purchase price or maybe as a bonus). Lew suspected that they were not giving him the share according to the arrangement, so he went up there one night and caught them cleaning that thing out when they thought he wouldn't know about it.

Lew came on the Mining Board of this state and added a good deal of life to it. Since California from its beginning as a state had been the leading gold producer of the nation, gold mining often was the subject of attention by the board. We were the go-betweens, between the industry, the legislature,

and the Division of Mines. In those days, the board was composed of mining men of high standing--men like Van Deinse, Browning, and Mein. Lew was a principal gold mining operator in the state and most expert on the subject. He had informed himself in depth concerning the usefulness and importance of gold in the monetary systems of the world during a trip to Europe in which he obtained audiences with principal finance ministers and individuals of the important European countries. He thus had much to contribute to the board.

He and I almost got to talk to President Kennedy about gold. In 1962, Kennedy and Governor "Pat" Brown flew to a dedication of a new federal entity in Shasta County. The signs of early-day gold mining were everywhere in sight on the ground below. The president asked Brown for explanation, which he gave. Brown subsequently advised me that he had so interested the president that it seemed feasible to set up an audience with Kennedy in Washington for a small group of gold miners, if I could get it together. That was easy. I nailed down Donald McLaughlin of Homestake, Henry Day of Day Mines, Merrill Shoup of Colorado, counted in myself, and of course Lew Huelsdonk. If Donald McLaughlin could be called "Mister Gold," so could Lew. Unfortunately for the project, President Kennedy went to Dallas very shortly before our meeting; the world knows the rest.

The position of gold in the economy of the United States became surprisingly poor in the years following World War II; this was especially noticeable in California. Gold mining has always had a potential for employing large numbers of men and for outlays of cash for large quantities of supplies, becoming thus of highest importance in the smaller communities of the Sierran Gold Belt. Gold production actually created and circulated a certain amount of new wealth. Success in such matters depends now on the price that gold can bring on world markets; although Washington took no effective action, the world price of gold now stands at a level some twelve times as high as in 1940. As a result, even though wage and supply costs have also increased about proportionately, certain noticeable gold ventures have come into being in the state during the very recent few years. These are, however, hampered by existence of regulation and controls by county governments that never existed before.

Lew, in recent years still operating old mines in isolated Sierra County, did a great deal that held that county together through the lean years. He was chairman of the Sierra County Republican Committee, and he was important personally to the community of Downieville, the county seat, in which he lived. He took on all the jobs that you can take on in a community. It was on him that the burden largely fell each time the federal or state government decreed that a new committee be created for some special need for modern welfare, as these have become so prevalent in recent years. He was like the king of a pretty good-sized piece of country.

Philip Read Bradley, Jr.
Former Chairman, California Mining Board

2 December 1988
Berkeley, California

INTERVIEW HISTORY

Lewis Huelsdonk was recommended by members of the advisory committee to be interviewed for the oral history series on Western Mining in the Twentieth Century because of his experience as manager of one of the famous mines in the California Gold Belt, the Ruby Mine near Downieville.

Mr. Huelsdonk was born in 1905 at the Great Ruby Mine--which, as he points out, was not great and did not mine rubies--near Jolon, California. His father had gone from Iowa to the Alaska gold rush, and then to California, where he worked a placer claim. Lewis helped his father, mining and also developing their own device for concentrating placer ore. It was marketed as the Huelsdonk Concentrator, manufactured in San Francisco.

After graduating from Mission High School in San Francisco, Lewis Huelsdonk worked in Grass Valley, learning assaying and mill management. In time he caught the attention of Clarence L. Best, who made a fortune with the Caterpillar tractor and invested in gold mines. From 1935 until Mr. Best's death in 1951 and the subsequent liquidation of the company, Lewis Huelsdonk was general manager for the Best Mines Company.

His oral history recounts his experiences learning about metallurgy and assaying from men with more formal training, superintending a mill, and managing the famed Ruby mine. This mine required specialized technology because much of its production came from an underground alluvial deposit, with gold nuggets the size of potatoes, many of which are now in museum exhibits. Included in the appendix of the oral history is his paper on drift mining from California Division of Mines Bulletin 135, Placer Mining for Gold in California, October 1946.

The Ruby Mine, like most gold mines in the United States, was closed during World War II by War Production Board Order L-208. Mr. Huelsdonk spent the war years producing chrome at the nearby Oxford and Gold Bluff Mines.

From 1954 to 1967 he was on the California Mining Board, serving for some time as secretary, and was known as the spokesman for gold mining. In this capacity he traveled to some international meetings and urged the return to a gold monetary standard. He was a member of the Western Governors Mining Advisory Council from 1955-1977. These activities are also discussed in his oral history. In 1986 he was elected to membership in the Legion of Honor of the Society of Mining Engineers of the American Institute of Mining, Metallurgical, Petroleum Engineers.

Philip Bradley, who wrote the introduction to the oral history, was chairman of the California Mining Board for many years and founder of the Western Governors Mining Advisory Council.

Two interviews were conducted at the pleasant Huelsdonk home in Grass Valley on May 23, 1986. Before beginning the first session, we looked at many of his scrapbooks and memorabilia which were laid out on a large drafting

table in his cozy basement study. Among the decorations on the walls were his wife Hazel's snowshoes, mementoes of times at the Ruby Mine when she needed them to walk to town from the mine in the winter.

The morning session was conducted in this study; we interviewed for two hours until Mr. Huelsdonk tired and we recessed. In the afternoon we resumed the interview, this time upstairs in Mr. Huelsdonk's office, where a photograph of an assortment of the famous Ruby nuggets is displayed above the desk. The transcript of the interviews was sent to Mr. Huelsdonk, who reviewed it promptly and returned it with a few revisions. Portions of the transcript have been re-arranged for better continuity. The tapes are deposited in The Bancroft Library.

Thanks are due to John Havard, vice president (retired) of Kaiser Engineers and member of the advisory committee of the oral history series on Western Mining in the Twentieth Century, who helped with arrangements for the interview, and to Debby Kirk, who generously donated her talents as transcriber and typist.

Eleanor Swent
Research interviewer and project director,
Western Mining in the Twentieth Century
Oral History Series

October 1988
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BIOGRAPHICAL INFORMATION

(Please print or write clearly)

Your full name Lewis Leroy Huelsdonk

Date of birth July 30, 1905 Place of birth Jolon, Calif.

Father's full name Adolph William Adolph Huelsdonk

Birthplace Germany

Occupation Mining Machinery (inventor)

Mother's full name Cora Flavilla Plackett

Birthplace Bridgport, Calif

Occupation Housewife

Where did you grow up? California

Present community Grass Valley, Nevada Co., California

Education Mission High School, Sierra City High School, Calif.

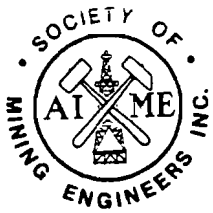
Occupation(s) Surveyor and Foreman, California State

Division of Highways. Assayer & Metallurgist for

at Golden Center Mines, Grass Valley. General Manager,
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Caller No. D
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November 19, 1986

Lewis L. Huelsdonk
13039 Ridge Road
Grass Valley, CA 95945

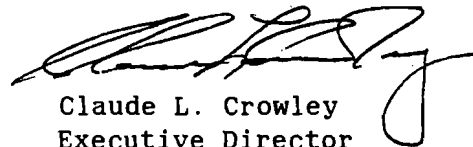
Dear Mr. Huelsdonk:

The Board of Directors has asked that you be informed that you have achieved Legion of Honor Fifty-Year Membership, Class of 1937. This change in membership status will be effective in January, 1988. You will continue to receive all membership privileges, but beginning in 1988 you will no longer be asked to pay dues. Also enclosed, for your information, is a list of all members elected to the Class of 1937 Legion of Honor.

A copy of this letter is being sent to the Chairman of your Section as well as the insignia of the Legion of Honor, a gold lapel pin, and a certificate. By copy of this letter, we are requesting that he contact you to establish a mutually agreeable time for the presentation. If circumstances do not permit your attending a meeting, I am sure he will be willing to bring or send the insignia to you.

The Board of Directors extends congratulations to you on having attained this honor and expresses its gratitude for your long-time loyalty and support to the Society.

Sincerely,



Claude L. Crowley
Executive Director

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Enclosures

cc: Paul W. Marshall
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I GROWING UP IN MINING, 1905-1928

The Great Ruby Mine, Jolon, California##

Swent: Let's just start, if you don't mind, at the beginning. Tell me where you were born.

Huelsdonk: I was born in 1905 at the Great Ruby Mine in Jolon in Monterey County. It was sort of a placer mine. My dad had it, and a fellow by the name of Hegerman who was the son of people who owned a series of hotels, particularly in San Mateo, I think. This was out of Jolon about four or five miles. King City would be the closest city. You come out from there toward the coast, and Jolon is in that area there. This mine had a lot of black sand and garnets that everybody was calling rubies [laughs], but they weren't, you know. And then it seemed strange to get back on a Ruby Mine, years and years later. One was called the Great Ruby, and the other was just the Ruby Mine. That was probably fifty years later.

Swent: This one down near Jolon was the Great Ruby Mine?

Huelsdonk: That was the name of it, but it was far from being great [laughs].

##This symbol indicates that a tape or a segment of a tape has begun or ended. For a guide to the tapes see page 55.

Family Background

Swent: Your father had come there from where?

Huelsdonk: He came there from Alaska. He went to the gold rush up in Alaska. He got great ideas, but they didn't turn out very well.

Swent: Where was your father born?

Huelsdonk: He was born in Germany. My grandfather had a nail factory in Holland. Then they moved to Germany. Then they picked up and moved to Iowa. My grandfather was in the farming business when he moved to Germany. And he went back in the farming business when they come to California.

Swent: Do you know where your father went in Alaska?

Huelsdonk: Well, he mentioned Fairbanks quite a bit. I was always going to take a trip up there, because I would have liked to have taken him along, but I could never seem to find the time. He told some interesting stories about when they first went up there. He came back and that's when he went to Monterey with this fellow Hegerman. Mr. Hegerman was the sweetheart of Maude Adams, the famous actress. I was just a little kid, and my brother was, and we sat on her lap for quite a little bit. He would meet her at Jolon. He would go down there for quail hunting. That's when he started going down there. He run into this Ruby Mine and did some of the financing on it, but it never paid off. That was part of the early, early history.

And then he married my mother who was one of the Plasketts, who had a ranch about eight or nine miles out from King City.

I was born there, my brother was born there, and my sister, Ruby, was born there. She was named Ruby on account of the Ruby Mine [laughs]. So, it was kind of interesting, but it didn't amount to anything in the long run.

Swent: And then you moved from there?

Huelsdonk: Yes, we moved from there to a channel out from Merced Falls. Cattle were ranging in that area, and it was known as the Thurston ranch, as I remember it. The hills were pretty steep in there. We set up a mining operation out there. It had a tailings problem; it took pretty big dams to hold the tailings back.

Swent: This was your father's independent operation?

Huelsdonk: That's right.

Swent: Did you boys help him?

Huelsdonk: Yes. In that picture there [indicates a photograph] I was about six years old. The Great Ruby didn't make any money. We took a little gold out, but that's far from making it.

The Huelsdonk Concentrator

Huelsdonk: Placer gold was a fine gold, and that's how come my father developed the placer machine. It was similar in head motion and in the stroke to the other concentrators except that it had no wash across it, it sort of settled. Then it went under a plate and the water coming this way bucked the gold out underneath the plates and to the amalgam plates out in the end of it. So, it would separate the fine gold from the black sand or concentrate.

My father went to work and developed that sort of unsuccessfully, ups and downs on it, to get sales going. He organized a couple of companies with some attorneys (I'm not going to mention their names), that he organized things with. Some funny work went along in there someplace. He wound up with a lot of debts, and so he got out of the gold mining business for a while.

Swent: This was sold and marketed as the Huelsdonk Concentrator?

Huelsdonk: That's right.

Swent: Did he have a patent on it?

Huelsdonk? Oh yes, he had a patent on it.

Swent: Did he manufacture them himself?

Huelsdonk: The California Cornice Company pressed out these tables for him. They were long metal tables, about thirty feet, and they were higher on the outside edge, so the water would settle down in there. And the fine gold would get on the bottom and go through, instead of having washover. It would get it up

Huelsdonk: toward the end just before they separated it, and then they would put the seconds back in again. This ran with a head motion, and the screen was a grate. It had about that much water under the screen, and it would go back and forth like this--[gestures to illustrate motion].

Swent: A couple of feet of water.

Huelsdonk: Yes, and then when the water would go this way (it had about a 3-1/2-inch stroke) it would go up, and it would roll the gravel over, and then it would set down on the other side, and then these would discharge on the tables, and you would get this down to about eight-inch stuff. And then it would separate the gold from the black sands and also from the concentrates we were using in the mills.

Now, first of all, before you ask me, I haven't got a degree in mining engineering.

Swent: Yes, I was just going to say, did you go to high school?

Huelsdonk: Oh yes. I went to Mission High School in San Francisco.

Swent: You lived in San Francisco?

Huelsdonk: Oh yes. We were building some Huelsdonk Concentrators in there, when Union Iron Works was doing the steel work. We had a place to put them together, and we had an office there at 2060 Market Street, I can even remember, on Church and Market there. It was an assay office, and the guys had gone broke in it, and we used it for a while. It wasn't a very good business. You had the competition of the big companies, and they all had these mining engineers come in. The Deister Concentrator and the Wilfley was another one in this competition. And there were a couple of other ones. Tables was what they called them. They would sell a pretty good bill of sale, and it was probably right. That's the way the world is.

I worked with B.W. Hills who ran an assay office in Grass Valley. I think he taught at the University of Toronto, up in Canada, at one time. I took a bunch of assays in there, and I got acquainted with him quite a bit. At that time they had just begun working on flotation. He was running quite a few of the samples. But in the meantime, the big mines, like the North Star and the Empire, they were getting their own assay offices. Then I began to study metallurgy with B.W. Hills.

Swent: How did you get from San Francisco up here to Grass Valley?

Huelsdonk: Well, we sold some concentrators up in this country, and then I got up and got acquainted with Cooley Butler through that way. And then he hired me.

II WORKING AROUND GRASS VALLEY, CALIFORNIA, 1928-1933

Hiring on with Cooley Butler at the Golden Center Mine

Swent: I'm really interested in just the very specific details of how you got hired at that time. Did you hear that there was a job open?

Huelsdonk: I guess I sold myself to Cooley Butler, when he came up. He would come up and make regular visits. He would ask me a lot of questions, and I was giving him the right answers. Cooley Butler was not a real technical guy, but he had learned this stuff, and he was a multimillionaire over and over. Butler Brothers was one of the biggest mining companies in the world, you know, back there in Minnesota.

So, he came up here, and as a matter of fact he got several mines around here. He tied them up. One was the Alta Hill, right down the street here, and he had the Golden Center Mine here. He was having his assay done by Mr. Hills, and I was running the assays for him. I studied pretty hard, that part of it, and mathematics also for surveying. So, I did some of the surveying for Cooley Butler, on making connections and things. I met a lot of mining engineers, you see. And I talked to them quite a little bit, and a lot of them helped me on it. Then I went to work for Cooley Butler. The big thing he lacked was a surveying crew, because he had just started up. He had a young fellow in the office there who was a mining engineer, but he was just out, and he didn't know very much about underground. He wasn't in there enough. So, I worked with him, I made the study.

Swent: And where was this?

Huelsdonk: This was at the Golden Center Mine, right here in Grass Valley. Finally, I talked to him about building his own assay office, which he did, and I was the assayer. So, he came on in and sampled these other mines. He was running diamond drill holes. Then I hired Hugh Bean, who was a graduate from the Colorado School of Mines, to get some help on this thing, because it was swamping me under, in the assaying also.

Swent: What time is this that we are talking about?

Huelsdonk: We're talking about probably around 1929, along in there.

Swent: What sort of arrangement did you make, when you say somebody hired you or you got a job? Did you sign any kind of agreement? Did he tell you the terms of the job?

Huelsdonk: No, just went to work for him. Of course, I had been around the mines a long time, you know, and I knew a whole lot about it.

Swent: Do you mind saying how much you made?

Huelsdonk: One hundred fifty dollars a month. Starting.

Swent: And did you have any benefits of any kind?

Huelsdonk: Not at that time. That was it.

Swent: Vacation?

Huelsdonk: Oh yes, you got a vacation.

Swent: Paid?

Huelsdonk: No [laughs].

The Assay Office

Huelsdonk: We opened the assay office right here at Alta Hill. It was an old timber shed that they had there. It was pretty good. It had nice new tin roofs and everything, so we lined it and put in the scales, and all the technical equipment. And we put in a furnace. There was a caretaker's place there before, and I wound up staying up there so I would be there when we were running these flotation tests.

Swent: So, you lived there as well?

Huelsdonk: I lived there just before I was married, you see. Finally, then when Hugh Bean (of course, he was highly technical) came in--

Swent: How much did you have to pay him?

Huelsdonk: For assaying, we paid him the same that I was getting, \$150 a month. Wages were \$3.50 and \$4.00 a day at that time, here in the mines. Millmen, they were getting about \$3.50 to \$4.00, and the head millman was getting \$5.00, depending on what mine. And then they got the Mine Workers' union in, and things got a little better, as far as wages were concerned.

Swent: There were no unions before?

Huelsdonk: There were a few coming in, but they weren't strong. Everybody was looking for a job back in those days [laughs]. Come the 1940s and in there, it was pretty tough.

Swent: When did Hugh Bean come in?

Huelsdonk: Just after he got out of school. He was related to Mrs. Butler some way or another, and that's how he got his job. Jobs were pretty scarce then. But I liked him fine. I knew I could get an education from him, you know.

Swent: But, you were his boss?

Huelsdonk: Yes, I was his boss. And I liked him, and he liked me. So, we got along fine.

Swent: Did you live at the mine?

Huelsdonk: Well, I stayed right there, because we put some things in the agitator, you know. We would test out cyaniding the concentrates. We tested out flotation and all the different reagents, kept records and assay records, you know.

The Flotation Plant and Smelter

Huelsdonk: We were working out to put the flotation plant in the Golden Center, at that time, and we finally did. Then Cooley built a smelter down in San Francisco for the concentrates. First, he sent B.W. Hills down there, and they had some kind of a row or something, and Cooley fired him. Then he sent me down there to be in charge.

Swent: When was this?

Huelsdonk: This would have been in the early thirties sometime.

Swent: And there was a smelter right in San Francisco?

Huelsdonk: It was right in South San Francisco. He built the whole thing, Cooley Butler did. That expense didn't bother him a bit. So the concentrates went down there.

Swent: How did they go down?

Huelsdonk: Shipped in a truck from the Golden Center Mine. They were outside, because the plant wasn't big enough to take care of the amount we were bringing down. It was a kind of a tough go, because we had checks on the assays down in there, and then the balance had better come out, according to what your tailings loss was. Old Cooley was pretty wise that way. He didn't want anybody stealing concentrates or getting the gold.

Swent: How did you guard the concentrates?

Huelsdonk: Oh, we didn't guard them at all. We didn't have to. Nobody was going to steal them, because it cost too much and they would have to have a plant to treat them. You see, the gold was already taken out, except the small amount that was left unground in the concentrates. Especially after the flotation got into it.

Swent: You had your flotation mill up here in Grass Valley?

Huelsdonk: Yes. I'm getting a little ahead of myself because I went in there first and helped put in the flotation plant, and that's when I got Hugh Bean to come and help. We would run the head stamps and the assays, and find out what our recovery was. We got it up to where we were getting around ninety-six percent recovery out of the concentrates from the flotation.

Swent: What kind of equipment were you using?

Huelsdonk: They made them in San Francisco. We used Oliver filters and things like that. The tables were Deisters, in the plant there. Those concentrates came separately, and they were reground. I'm talking about the mill here in Grass Valley. We just used one Deister, as a guide, whether we were losing from the flotation after we got the flotation cells in it. If the concentrates started coming in the Deister, then we knew something was wrong with the reagents or so forth. It wasn't so easy as it is now. You had to watch, and you had to assay all the time.

A fellow named Lobdell contracted to haul the concentrates down to South San Francisco. He would dump them and then we had to get some big tarps to put over them, because the South San Francisco sun would hit them. They would dry, and the wind would blow. Then we had to arrange to put them down in the smelter plant. It worked out all right for quite a while, but finally we wound up by shutting that down and shipping them directly to the American Smelting and Refining Company smelter at Selby. This probably should have been done before; somebody told them how to save money, but it wasn't exactly true; it didn't work out that way. There were a couple of other fellows in that that I don't care to name, because if I can't say something good about somebody, I don't say anything, but anyway, then the job fell on me, the assaying and the control of the concentrates and the flotation mill.

Then Cooley thought that by roasting these concentrates and getting the SO₂, sulfur dioxide, gas put in, that would dissolve the manganese and free the iron. At that time, a market developed for manganese sulfate. Now ordinarily you would think, with SO₂, sulfurous acid, you should get manganese sulfate, but it doesn't work that way. It picks up one atom of oxygentizer that makes it sulfate.

There was a pretty good market for that, but they weren't into it big enough at the Golden Center to ship enough concentrates to get into it in a big way. He figured that would lessen the cost of the operation up in Grass Valley, but it didn't exactly. Old Cooley was pretty good at it, but, of course, he didn't need any money anyway. Finally he decided to close that operation down, and I don't know whether he took a loss. That was up to his income tax fellows. But I know he didn't make a whole lot of money, or he wouldn't have closed. The Golden Center was just more or less on the verge, too.

Huelsdonk: During that four years I was with them, I had full sway on the thing.

Swent: You were learning a lot about assaying?

Huelsdonk: Assaying, and metallurgy, too. Well, I had chemistry in high school, so it wasn't so hard, you know.

III THE RUBY MINE

Huelsdonk: In the meantime, I got acquainted with Mr. C.L. [Clarence Leo] Best. He had bought a Huelsdonk concentrator up at the Ruby. He got in a little trouble with it a few times, and I went up there and straightened it out. So, getting down to shortening a long story, he made me a better proposition, with quite a bit more money. Finally, toward the last he was paying me \$1500 a month to run the Ruby, and that was a lot of money at that time.

Swent: In the middle thirties?

Huelsdonk: Well, it got into the forties and fifties and so forth.

Swent: This was up at Downieville?

Huelsdonk: This was between Downieville and Alleghany. The Ruby Mine is about halfway between them.

Living Arrangements

Swent: What was your living situation then?

Huelsdonk: By this time we had gotten married, and we had an apartment built over the office up at the Ruby Mine, and it was very comfortable, except we did get snowed in. But see, it's only three and one-half miles down to Goodyears Bar on snowshoes. To walk down is pretty easy. In the summer, you had to go around Mountain House and come on in that way or come in from Alleghany. Finally the county began to recognize the value of the Ruby Mine, so they started opening roads as soon as they could, to get the trucks in.

Swent: When you were a bachelor, did you board at a boarding house?

Huelsdonk: I ate at the Owl Tavern, down in Grass Valley.

Swent: Did they have boarding houses?

Huelsdonk: We did at the Ruby, because we had to. We built a boarding house up there, and we boarded there.

Swent: Did the men sleep there?

Huelsdonk: Oh, they slept and ate, and we had a chef and two flunkies to serve dinner. We served good dinners, too, because if you didn't you wouldn't keep men up there. But they saved money, see. They would come in there and go the winter.

Swent: When you were working here in Grass Valley, you were on your own?

Huelsdonk: Yes, as far as eating and stuff. But I was living where the assay office was down here, and that way I could kind of watch control of the assay offices. I'd drive downtown and eat breakfast, and they would fix me a lunch at the restaurant. I would bring it back.

Swent: In a bucket?

Huelsdonk: No, in a bag. They would put it in wax paper, and it was real good. I had a percolator up there and could make coffee, and so I was quite comfortable and satisfied.

Swent: Was your wife from Grass Valley?

Huelsdonk: Yes. I met her here in Grass Valley. Then I took her up the Ruby [laughs]. That's what she says, "Yes, and then you took me up the Ruby." But she enjoyed it because we took trips all the time from there. Mr. Best was very liberal in that way, as long as you were doing a good job.

Clarence Leo Best

Swent: Where did he live?

Huelsdonk: He lived in San Leandro. He was president of Caterpillar Tractor and later chairman of the board of Caterpillar Tractor, and they had headquarters down in San Leandro. But he would come up and stay at the Ruby.

Swent: How did he get into the mining business? Which came first, the mining or the tractors?

Huelsdonk: Well, I'll tell you, a fellow by the name of Gillman was a mining engineer in San Francisco, and he had some kind of a tie-up on the Ruby. He talked him into going in there. Another friend of C.L.'s had it first, and I think C.L. helped him out financially. Then he got mixed into it and got interested. Then he talked me into going up there. He made a good offer, of course. And then Hazel and I got married, and she moved up there, and we built an apartment over the top of it.

Swent: You were the manager of the whole thing then?

Huelsdonk: Yes, general manager.

Swent: Up until then, your experience had been more with the metallurgy?

Huelsdonk: That's right. I knew that ore very well, and so that is how I got to talking to Mr. Best. I guess he liked me because it went on.

Managing the Ruby Mine

Huelsdonk: Then he and Gillman had a little trouble. Gillman wasn't keeping up proper maps or something. C.L. was no fool. He sent a guy in to kind of check, and the guy apparently gave me a pretty good record. He had another fellow up there who was managing the thing, so he fired the other fellow and put me in charge. And that's the way it came. That's kind of a long story, some of which I don't care to relate, but we had a very satisfactory relationship.

Making a Subsurface Model

Huelsdonk: In the meantime, I made a subsurface model of the bedrock under the lava. I had to talk Mr. Best into that. We had a Dr. Grossman who was over in Alleghany doing some geophysics work. I contacted him, and he said he could help us out. The lava was in some places 900 feet deep over the bedrock, and he was a little leery about getting his instrument to penetrate that far, in order to get the reaction necessary to place the subsurface bedrock. You had two channels there, one that they call the tertiary period, and then you had the intervolcanic channel, which came in later, and it cut the tertiary out. The intervolcanic channel provided no gold, but wherever it cut the tertiary channel out, it redeposited gold down on that lower level, and a lot of these big nuggets come from there. Well, I got onto that pretty quick, so I talked to Mr. Best about getting a geophysics survey and building the subsurface [model] that would outline where those channels were.

Swent: Now, was this something that hadn't been possible to do, before that?

Huelsdonk: Well, in a way, and it was still a little shaky. We put diamond drill holes down to check, and some were quite a little off from what the geophysics said they were, but generally we were getting a pretty close check. I kept track of the difference whenever we'd check a section where the diamond drills showed bedrock, and if this was up or down. I worked out an average factor to correct the differences in them, which all seemed to be fairly consistent. If you got a deeper hole, you'd be off, say, fifteen feet, and at the shallower holes, you'd be just about on it. I worked out a factor between those holes which outlined the channels, and it came out very good.

We drove 8,000 feet to get in under the lava, to get that gold we got in here, because when I finished with the model, it showed the intervolcanic channel come in there through the bedrock contour where a channel would go. In the meantime, it was filled up with loose gravel, intervolcanic gravel, and the old tertiary was mostly quartz gravels. It would be cut off all at once. You know, you would be following that channel outline, and you would have a big cutoff on there. Well, that's where the intervolcanic channel would cut into it. They apparently came down the same canyons and cut through. Well, it made good sense, if it cut through that with enough water to concentrate, those nuggets would be cut out of the upper channel and go down in there.

Huelsdonk: Bert Austin came into the picture; he was a mining engineer. I sold him on the idea first. I didn't want to be hanging up there alone on this, because I know it made good sense. He saw it right away. We talked to Mr. Best, and he said, "Go ahead and do it."

Swent: And do what?

Huelsdonk: Get this thing lined up and make a map. I made a survey all the way through of the subsurface, and then wherever we put the holes down we knew it was right when the diamond drill hit at 168 feet, or 300 feet, or some of them were four or five hundred feet, you know. It worked out pretty good. At least it worked out close enough. We just lifted the lava and everything right off of that, and here you saw the old canyons were in there. And we drove out there, and we hit the thing exactly where it had been cut off on all that distance. Well, then there was a hole in the lava shaft that was quite a ways north, and they had mined up there a little bit but there was no gold, and that was in the intervalcanic channel. So they had quit, but they had gone south quite a ways. Well, see, we were in there quite a ways, and we were pumping air through a twelve-inch pipe finally. It took quite a bit of pressure, and with the friction and the leaks in there, you weren't getting enough air for a big crew.

Driving a Ventilation Tunnel

Swent: This was for ventilation?

Huelsdonk: Ventilation. That other high pressure air come in smaller pipes. But this blower from outside was blowing in, your friction in the pipe and the few leaks we wrapped as good as we could. We had a meeting, and I talked C.L. into letting me drive and connect with the drift that comes south. And he says, "You think you can hit that?" I said, "So far, I think I can!" Of course, you have got to get the elevation, you've got to get everything just right, see? Well, I run that up, but we had a survey of it down below, so I could get an elevation of the bedrock there. We hit it right in and exactly on grade, and that made me. That made me.

Swent: You were driving in from the south to connect with--

Huelsdonk: We were driving in from the west actually, and the channel came down and crossed over. It was a regular system. We got the ground tied up, and we had that shaft. That made good ventilation in there and we could get a full crew going in there without any trouble. Then we started mining it, and that's where most all that gold came from. We were taking that gold out when L-208* came in.

Keeping the Mine Going

Swent: Let's get to L-208 in a minute. But before that, I wanted to ask who did your diamond drilling. Did you do your own?

Huelsdonk: Oh, no. Mitchell Diamond Drilling Company.

Swent: You contracted with them?

Huelsdonk: Yes, to drill the holes, because by the time you buy all the equipment and everything, they could do it cheaper. And I got a good contract with them. I remember that. He was a friend of mine also, and I'd worked with him before.

Swent: And you kept all the drill cores then, and did all the tabulating?

Huelsdonk: Oh, yes. I think they're still up there at the Ruby. And the maps, well, I've got a lot of the maps here.

Swent: And you did your own assaying?

Huelsdonk: Yes, for a long time, and then finally after Hugh Bean came on the job, we had him do some, unless we were interested in a mine, and then I did the assaying on that, to see whether it would be worthwhile to spend the money on it. We would take samples for another mine. People were all trying to sell you a mine someplace.

Swent: Did your miners work on contract or on straight days?

*War Production Board order L-208. See p. 23 for more on its effects.

Huelsdonk: We drove that tunnel out there on contract, and paid a bonus for so much over so many feet. I don't remember exactly what it was now, but they drove that tunnel back there 8,000 foot in record time. And they held good, on grade and direction, but had to be checked continually during a contract like that, when going fast. They had to keep on grade, or else go back and drill down where they got off. So, they were careful in driving ahead. There were two brothers who did the contracting on there. I didn't interfere with them, as long as they got the tunnel in; they had their own crews and knew how to do it.

Swent: I wanted to know a little more about the situation up at the Ruby. Did you provide housing for your workers? Did you live in a company house yourself?

Huelsdonk: In an apartment up above the office. Down below we had a furnace for melting gold and another little room out above. We didn't have an assay office in the Ruby because the work we were doing there wouldn't require assaying. That was getting these nuggets out. You panned to find the pay streaks and the course of the channel, and then you mined the gravel, brought it outside, and run it through the washing plant, where the hopper on the Huelsdonk [concentrator] caught all the heavy gold on a screen that also acted as a jig. The heavy nuggets stayed on the screen, and the small ones and fine gold went through the screen and were concentrated out on the table. We did a little prospecting on the quartz ledges in there, but we sent the assaying work out simply because we didn't want to set up a complete office there. There wouldn't have been enough assaying to justify it.

Swent: In the winter, you said you were snowed in.

Huelsdonk: Well, we would make an occasional trip out. It was three and one-half miles down on the snow shoes. Once you get down about halfway, then the snow would be off. Goodyears Bar had an elevation of less than 3,000 feet.

Swent: There was no road in there at all?

Huelsdonk: Oh yes, but it is blocked with snow. You see, you come up by the Mountain House, and you get up to fourteen or fifteen feet of snow. And then to get on the Ruby, you usually had around seven feet, as you can see in some of those pictures. And then, of course, we had snow sheds up there, from the tunnel on out to the mills and everything. Locomotives never had to stop unless some snow blew in.

Swent: Did you just keep your concentrates there until the road was cleared?

Huelsdonk: Yes, we'd store the concentrates and then haul them out when the roads opened. But we kept a tractor there, so it would have to be pretty tough before we were closed in. One year, we may have been closed in for about two or three weeks, but outside of that we could get out in a week or so. We always put a man on the road with the bulldozer, and he'd bulldoze the snow off.

Swent: But you couldn't, for personal transportation.

Huelsdonk: Well, it was easier to go down, just go right on down on top. There was a trail going down there. It wasn't too steep, and we would put the snow shoes on, which was fast. We had men walking in and out, too, quite a bit, and they packed it pretty well into a track.

Swent: Did you live at the mine all the time?

Huelsdonk: Yes, we were stationed up there. We lived at this apartment up above the office. Then, we had two rooms off from the place for the foreman and the underground superintendent.

Swent: You were the only family there.

Huelsdonk: Yes, except in the summer. A lot of them would come up with their wives and kids, and then we had camping facilities for them.

Swent: A camp?

Huelsdonk: Well, a sort of camp. It was the old Wisconsin Mine. They had a big bunkhouse and cook house, and we made that over, and then put bunkhouse rooms up above for the crew. We usually had about forty men staying in that.

Swent: And they stayed in the winter?

Huelsdonk: They stayed right in the winter. In the summer it was pretty hard, because people run out.

Swent: Did you eat at the cook house, you and your wife?

Huelsdonk: Well, no, but we would go up for Sunday dinner. They had a place all set off from the kitchen, and they would serve us dinner out there whenever we wanted to.

Swent: Was your wife the only woman there?

Huelsdonk: The wife of "Buck" Hinton, the master mechanic, would come up once in a while and stay. He had a room downstairs off from the office. And the mine foreman did too. Of course, the men were all married, and most of them lived in Downieville. They would hike down once a week, over Sunday, or something like that.

Swent: Did you have children?

Huelsdonk: No, we didn't have any children, but some of them did.

Swent: How did you go about hiring miners?

Huelsdonk: We had plenty. At that time, we had a pretty good-sized list of them, and we phoned and found out. In the meantime, if they got a job, we would go to the next fellow.

Swent: These were local people?

Huelsdonk: Mostly all local. We started in through the employment agencies, but they weren't so good. They weren't as reliable as the local people.

Swent: Where were these agencies?

Huelsdonk: Sacramento. They would send these--well, they went from one camp to another--not too reliable. And, of course, a lot of them came up because they thought they could high-grade, you see. We had a little problem in that.

Catching the High-graders

Swent: That was another thing I wanted to ask about, was high-grading. What did you do to prevent it?

Huelsdonk: Well, it got pretty bad at one time, and we got John Bongard, he was the California chief on this sort of thing, you know, watching for high-grade. He was ore buyers' inspector with the Division of Mines. But it got a little bit too much, so he contacted the Secret Service. On gold, it's not the FBI, it's the Secret Service, and it's a different agency. I talked it over with a guy named Rich, who was the apparent head of the Secret Service in this West Coast area. He arranged to get two

Huelsdonk: agents to come up and rustle a job the same as any other miner would do. They had studied enough that they were experienced enough.

We were hiring a lot of people, because this mining was a little different than most mines you get down here. It's hard rock mining and drilling, you see. We broke them in just the same as the other fellows. They were working and then pretty soon they started inquiring where they could sell it. They got a lot of information. I was the only one that knew it. I would never give it away to this day who they were, and nobody knew. They covered up. I had to give them gold a couple of times to go sell. They were interested not so much in the guys who were stealing a few dollars from the mine but, "Where is this gold going?" They found a lot of it was going to Europe, down around the Mediterranean, France, and different places. The buyers sold it all over, wherever they could get a market. They didn't pay the miners very much for it. Grass Valley was quite a community for high-grading. They had rich quartz here, and they had quite a bit of trouble. I thought once and for all I should put an end to it, and that did, as far as the Ruby was concerned.

Swent: How did they high-grade?

Huelsdonk: Sometimes this stuff would be on the bedrock along in crevices. Of course, the quartz ledge up there was pretty good, too, when it would come, but it would be in bunches. It didn't make a good mining situation, because you couldn't lay out your ore reserves or anything like you could where you could make regular assays. You could get an assay here, maybe ninety cents, and get one over here for two hundred dollars or more and this would open the door for high-grading.

Swent: The miners would pick up these nuggets and stick them in their pockets?

Huelsdonk: Well, yes, they devised quite a few ways, and these Secret Service guys kind of helped them, showed them how. You had to be careful about the help in the mill, especially the night shift. They'd run down and then clean up. They would have several thousand dollars worth of gold in there, and it wouldn't be anything for them to slip a nugget in their pockets.

Swent: Did you inspect your miners when they left work?

Huelsdonk: Not always, but that didn't do any good. They knew how.

Swent: Did you do spot checks at all?

Huelsdonk: Oh yes, we checked, and we had a signal if anybody went back in the mine after it was closed. We had a door we'd lock, but, you know, they'd get the keys to it too. Anytime that anybody went in there, the signal would come in the office or upstairs. We caught quite a few.

If we fired them for high-grading, they could come back and sue. You have to be awfully careful about defamation of character and all these darn things. We finally knew about who the ones were, and just eliminated, changed the job, or shut the works down where the high-graders were, and then got new men to go in there. They just didn't publicize any of it.

There were lots of honest men. We had them in the mill, and we had them in the mine. I'd say out of a crew of fifty there were probably forty-five or so that were honest, and you didn't have to watch them very closely. They were getting a check. But you always have those problems, and you just have to take care of them. After that we got along pretty well, as far as I know. There were some that probably got away.

Swent: What time was this?

Huelsdonk: That was in the thirties.

Swent: So, gold was \$35 then?

Huelsdonk: It went to \$35 in 1942, and that's where they held it. Operating costs had gone up at least ten times, from what it was before. And this is what shut the Ruby Mine down, just that very fact that you couldn't get anybody to work for the money you could pay, and there is no use in running at a loss.

Swent: Did you shut down before the War Production Board Order L-208?

Huelsdonk: No, L-208 shut us down. This is what I'm kicking about. They froze the price of gold at \$35. In the meantime, prices were going up everywhere, especially labor. We increased around seven dollars a day for basic labor. And then they weren't doing as much work as the old timers were doing, at more pay. We mechanized as much as we could, with mucking machines and things like that, to cut costs, but by the time you paid the capital expense and depreciation, it was kind of a tough deal. We weren't the only ones that never opened up again. They used

Huelsdonk: to hire in Grass Valley several thousand men in the gold mining industry at the Empire-Star and the Idaho-Maryland and the Brunswick. They had probably three or four thousand men working directly in the mines.

Swent: And you said that you were hiring about fifty miners?

Huelsdonk: Well, about fifty was the limit we could handle up at the cook house. In the summertime, we'd have quite a few more, because they could live around there and work, and they could drive in from Downieville. To hire more in the winter, we would have had to build more bunkhouse facilities and at that price of gold, there was just no sense in it.

World War II

Shutting Down the Gold Mine

Swent: Did you have any anticipation of this L-208 ruling?

Huelsdonk: No, we just got the order to shut the mine down.

Swent: How did it come?

Huelsdonk: We got a notice through the Treasury Department-- "Shut the gold mines down." All gold mines where you had primary gold mining had to be shut down. My project then became to get the price of gold raised. I got together with Phil Bradley and Dr. [Donald] McLaughlin, and a bunch of them, because they were up against the same thing. We tried to get the price raised. This didn't happen right away, you know. I think it was about \$350 this morning. That's ten times what it was before. But our costs went up about ten times, too, before that. But ten times \$35 would be \$350 an ounce for gold, instead of \$35.

Mining Chrome

Swent: You said you did continue mining some chrome though.

Huelsdonk: Yes, we did. You see, that was in the surface, and that was at Downieville. At that time, we took over the Oxford and the Gold Bluff and a couple of the other mines up there, where there were some of these chrome deposits.

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Huelsdonk: So, we kept a lot of our crew together to mine this chrome on account of the war thing. You could get a priority to hire them, but where they were within draft age, even for the chrome operation, you couldn't get them deferred from military duty. Not even for chrome. But, of course, a lot of the fellows couldn't make the military requirements anyway. A lot of them were older and whatnot. So, we had the Oxford Mill there. We switched the flotation part of it over to gravity concentration so it would handle the chrome and upgrade it to specifications for shipment.

Swent: You could use the same mill?

Huelsdonk: Oh, yes, but you see you had to use different reagents and you had to grind to a certain fineness to release the chrome, so you could float it separately so it would be high-grade enough to sell to the government. Of course, you have a pretty high tailing loss, too. If you ground it too fine, you would get too many slimes, and the slimes would assay almost the same as the ore. We worked the metallurgy out on it by gravity. We got it and we started hauling concentrates then to Selby, as that was then the government's chrome call station. We kept them up within the regulations. Now, if we tried to get it up to a higher grade, we would get paid a little bit more for them except that the loss would go more than what you would get from the difference. So, we ran it to a grade that we could ship and keep from losing too much money [laughs]. We lost money on the chrome, but it was supposed to be a patriotic duty so we didn't kick about it very much.

Mine Safety and Health

Swent: What did you do about safety and health for your miners? Did you have a doctor?

Huelsdonk: No, the doctor was in Downieville, but they were 100 percent first aid trained and we had crews that knew heart resuscitation and all that. We had a first aid class. The Bureau of Mines and the Division of Mines of California sent instructors, and they were good. We lost one man up there in all the time we mined there, and that was in a cave-in. It was somewhat his own

Huelsdonk: fault, too, but you would say that anyway, I suppose, but he got caved on and killed. His name was McGuire. But most anything, like you would have sometimes a fellow get hurt, you know, we had the facilities to take them right down to town, get him down there before the doctor could get up. Although we had good facilities. We had one big room set up with a couch in it and everything, all the first aid supplies, splints, and everything else. The people in charge were trained. Outside of that one serious accident, we got along real well.

Swent: What were your relationships like with the Bureau of Mines?

Huelsdonk: Oh, very good, yes. We had no problem with safety. But you had to keep up safety. You had to have fire doors in case a building caught on fire outside, the doors close automatically. But this worked fine, too, because we were only running two shifts and we liked to keep those doors locked, you know, when nobody was in there. And we had to ventilate, so we got a second exit out there, and I think I told you about the second exit before. So after that we had plenty of ventilation, but that was for later work.

Swent: You were talking about the mucking machines. Were they Gardner-Denver?

Huelsdonk: Gardner-Denver and Ingersoll Rand.

Swent: During the war then you continued with the chrome. At the end of the war did you try to reopen the gold mine at all?

Huelsdonk: We never went back to the Ruby. We sold it, took a loss on the sale, and used it against some of the costs on the other operations.

Swent: If you had not been shut down, could you probably have continued mining?

Huelsdonk: Well, we probably would have. But there would be so much after that four years or so, the caves and a lot of heavy ground in there. And then the price of gold was not anywhere near what it should have been.

Swent: But you still had ore.

Huelsdonk: The mine is still there. Someone tried it afterwards.

IV THE BRUSH CREEK MINE

"A Pretty Good Quartz Mine"

Huelsdonk: Now see what happened, we took over the Brush Creek Mine, and that was a pretty good quartz mine down there. We rebuilt the mill and put flotation in and brought it up to date. We opened the thing up there for quite a while and they had a little haywire mill in there and tailings go right into Goodyears Bar. There was no way, for a while they could do that, but the laws got a little different, you know, you had to take care of them. But we had the Oxford mill where we milled the chrome and we brought it pretty much up to date. We hauled the ore from the Brush Creek up to the Oxford Mill and we had a modern flotation for gold up there. Then we hauled the concentrates to Selby, besides amalgamating the gold itself. Brush Creek was a pretty good mine. The point is, then we sold the Ruby. Somebody said, "Why did you sell the Ruby?" Well, it was wrecked in there and it would have cost a whole lot. We could take that loss against the production of the Brush Creek Mine, from an income tax standpoint.

Swent: When did the Brush Creek close?

Huelsdonk: The Brush Creek, let's see. I'll have to do some thinking. I've got records on it all. Well, hauling it up to the mine, and one thing and another, was quite a little while. Now, we would have had to sink the shaft deeper, and we had all those expenses. Mr. Best was getting pretty old, too, you know. Then he died, and Mrs. Best became president of the company. So, I had to be a little more careful with her. I didn't want to break her, though I did with Mr. Best, because he would understand the thing. So, she went on, and she did a real good job.

Swent: This was just a kind of investment for him, wasn't it? He had his money.

Huelsdonk: Yes, sure. He wasn't worrying about going broke. He was very good, but he was very strict too. You had to have everything laid right out. He had his accountants and everything else to go over all of the problems. It was probably a good thing, because both the Ruby and the Brush Creek had been run pretty sloppily before. The Brush Creek when they had the early ore, they stoped out everything they had that was easy to get. When it came to sinking the shaft, by that time the cost of sinking a shaft ran about \$500 a foot. It wasn't easy. Before, you used to be able to get contractors. I think we sunk the shaft for the quartz in the Ruby for labor of thirty dollars a foot. You couldn't even come close to that later. That would be just for the labor and a proportionate overhead charge. So, it was probably about forty dollars a foot. That was only a compartment and a half, and the vein was kind of small. The Ruby was kind of erratic, you see. That was a quartz vein in there. We had a little stamp mill up there and flotation too, a separate mill from the gravel mill.

Closing the Mine

Huelsdonk: But I was talking about the Brush Creek, see. It was fairly consistent, and the production was pretty good there. But, when you put it all together and get the figures, and get an average of what your ore shoots are going to be and the limitation to them (with a few diamond drill holes, you can check that out pretty good), we decided--I know if Mr. Best had been alive, we would have probably gone on down and sunk some more, but the way Mrs. Best was (she was getting pretty old too), I figured she needed the money more than she needed the expense.

Swent: They were the only owners? There were no stockholders?

Huelsdonk: Well, Best Mines was a stockholders' closed corporation. That's the way it was. I did fine on the job as far as money was concerned, with bonuses and what not.

V A MINING ADVISOR

The California Mine Advisory Board, 1954-1967

- Swent: When did you go on the California Mine Advisory Board?
- Huelsdonk: Well, let's see. God, it goes back quite a ways. I was on under Governor Knight first, whenever he was on (those terms were for four years), and you would have to look up that because I don't remember when he was in there. Then, the next one, and I was there under Brown.
- Swent: Which Brown?
- Huelsdonk: Just "Pat" Brown. It wasn't very satisfactory under the boy, Jerry.
- Swent: He wasn't much interested in mining, was he?
- Huelsdonk: I could never get to him very well on it. Reagan was pretty good. But Knight, of course, was an old gold miner from Mojave. He had a gold mine down there someplace. He never made very much money out of it, if any.
- Swent: He was interested in mining?
- Huelsdonk: Oh, yes, he was interested in mining, but he never interfered in that score.
- Swent: How did he appoint you?
- Huelsdonk: He consulted with Bert Austin and a whole bunch of the other mining engineers around there. They gave him an okay for me for the board, and I got a nice letter asking me. Then, he called

Huelsdonk: me up. He said that this vacancy had occurred and he wanted me to go down and take it, which I did. This only meant a meeting a month, but you get a lot of good information from it.

The Western Governors Mining Advisory Council, 1955-1977

Huelsdonk: Then the western governors, they got all together on this gold situation. The western governors were primarily the ones that had gold mines in their states. They decided to set up what they called the Western Governors Mining Advisory Council. So, then as the importance of different mineral come out, they set up individual chairmen for each, and I was set up as chairman for the Gold Committee on it, which was pretty good, because I got the information firsthand from most of them, trying to get some sense to it. The most sense would be an increase in the price of gold, of course. I worked on that one.

Swent: So, you met with all the governors then from the western states?

Huelsdonk: Oh, yes, and with my ability to recall names that was something. Old Knight, I can remember him. He told me, he said, "Now, when you get an appointment and talk to any of these guys, make sure you get their name and then remember it." He said, "They are all a little bit gratified about that!" He was outspoken. I think Knight led the Western Governors Conference a good part, but you see these guys from Colorado and Montana and all, they were along because it covered all the mineral commodities-- manganese, chrome, and all the mineral commodities. Now, Dr. McLaughlin* was pretty influential in that too, although South Dakota wasn't exactly what you would call a western state, but he was all for it 100 percent. He came to a lot of the meetings. That's where I really got acquainted with him, you know, on it. That's one reason I went to Europe, to meet these different folks.

Swent: Perhaps you would like to tell me about going to Europe.

Huelsdonk: Well, see, this gold situation was getting kind of lopsided, you know. Certainly, the price of gold should have been raised a long time ago. And so I wrote a couple or three articles, maybe more than that, explaining this in detail, as much as I could,

*Donald McLaughlin was president and later chairman of Homestake Mining Company, owner of the Homestake Mine, Lead, South Dakota.

Huelsdonk: what would happen on these exchange rates if we didn't have absolute security over exchange rates. A collateral had to be physical and tangible. Now, this could only be gold, because you can take a note, that's fine. We have monetized notes now from the Federal Reserve. South America is a good example. You have Argentina and Brazil. They owe us all kinds of money, and they give us a note signed. Well, the Federal Reserve takes that money and puts out Federal Reserve notes against it. Well, what are you going to convert that into? Some other Federal Reserve note or some other paper? See, it's not a real tangible thing because it could burn up or not be redeemed or it could be lost. The percentage that doesn't get paid, and if you chase this down you will find out, almost equals the percentage of inflation. A lot of these bankers, they make you believe they believe in this, but they really don't. In my articles, I was trying to point out how good it would be if you knew for sure what your exchange rate would be, for instance, for the Japanese yen. Oh, at that time, the dollar was getting so valuable, they were patting us on the back. Most of these politicians didn't know-- "The dollar's going up, gee that's fine. Big high value." God, that means you can buy more foreign currencies. And you buy their currency to pay for their goods, you see, so it's a discount in their exports, which was detrimental to our exports. This is the main thing I was touting in most of these meetings.

Swent: You have been proved right, haven't you?

Huelsdonk: Yes. I got a lot of backing from Dr. McLaughlin on that score. He understood it. We had several meetings and talked about it. But in his position at Homestake mine and U.C. [he was a Regent of the University of California] didn't want to make too much about it. It looks like we are trying to force if we get some of those bigger mines, like Empire-Star and the Newmont Company. But see, both mines here, they closed down at that time, and they haven't opened yet. So, what Grass Valley makes up for it, I don't know. The economy is up and down, up and down, depending on how many tourists come in, how much they are going to spend. But the mines are all shut down--the Idaho-Maryland is gone, the Empire-Star. And they were big producers, and they are deep, so it is not easy to open these mines. The Empire-Star goes down 8,000 feet. It's hot down in there, and they have got to get ventilation. To open it up would cost millions now. But they will. I think they will open it up.

I can't see anything that will ever equalize international currency exchange rates except gold at a standardized price as collateral. When you mint a twenty-dollar gold piece, you don't

Huelsdonk: have to have collateral, you see what I mean. That was the way it used to be. A twenty-dollar gold piece now would be worth \$400 to \$1000 or whatever you could get, even at the present price in currency. But, it's against the law. They don't mint them anymore, because too many guys would bury them or take them to Europe or elsewhere. We overlook that part on certain ideas, but I am just hoping some of these economists will get a hold of it and straighten it out, because if they don't, we are going to get into the same inflationary deal we got into before. Because the Japanese are anxious to sell to us. And not only the Japanese, but other foreign nations. If they devalue their currencies against ours, make our dollar look big and brag on us. And our politicians swell up over the dollar, saying, "Oh, your dollar is saving money" by being able to buy foreign currencies cheaper.

Some of the professors can see it, but some of them can't. They think it's good, and they are trying to explain it, but I don't think they understand the business very well. This is a field that is open and is going to have to be straightened out one of these days, I'm sure.

International Monetary Meetings, 1956-1975

Swent: Would you like to tell me now about your trip to Europe in 1956?

Huelsdonk: The meetings that I mentioned were held after the European trip, at the Miami Beach Hyatt House on January 5, 6, 7, and 8, 1975. I was among the speakers at their symposium and it was where I met Dr. Nico Diedericks, who was then Minister of Finance of the Republic of South Africa, and I understand that he was later elected president. You will have to excuse some of my confusion, since this was thirty-one years ago.

Swent: What you can remember is fine. Were you the only American representative at the European meetings?

Huelsdonk: Yes. Most of the monetary authorities, I got appointments with them ahead, and I had several, like Dr. Busschau, who didn't show up from the Union of South Africa, because I had had a previous meeting with him in San Francisco. That was arranged by Dr. McLaughlin and William Wallace Mein at the Pacific Union Club.

Swent: Where?

Huelsdonk: I had the meetings in England, but I had already met with Dr. Busschau in New York before. He arranged some of these meetings for me. But I had a lot of other help on that. Dr. McLaughlin was another one, see, because he knew many of these fellows out there.

So, I got to England and met with the bank authorities. I could see right away they didn't want gold. Obviously, they wanted the British pound to be the big thing, you know, and in France and in Paris it was the same thing. The banking authorities didn't seem to want it. They thought they had better control. But in order to do it, they were monetizing, I guess, notes from different countries. Sure, they look good now, but what if they go broke? You know what I mean. And what if that note gets burned? When you monetize debt, you're creating debt. And so you are creating a money that is debt, because you're convertible into that debt, is all. And if that debt is not paid, you've lost your money. A lot of those nations that have done that, like Brazil, they went broke, they never even paid the interest on loans that were monetized in the USA. And Mexico is another one. I have quite a bit of statistics. I think I've got a file downstairs.

So, when I came back, I had Dr. McLaughlin go over the stuff mostly and get it straightened out. He thought it was great. I had learned a lot from him before I went over. I have got a lot of the information on it, if it ever gets strong enough to provoke the politicians' interests in it; because they are the only ones who can do anything about it. I have talked to some, but they go back and talk to the other politicians, and decide they had better leave it alone. But some day they are going to have to stabilize the exchange rates throughout the world with tangible collateral. They are going to have to have a collateral that is a physical and tangible thing, that you can convert these things into. Each one would have an exchange rate between them, and then you can convert your money, and they have this collateral there. That money would be as good as your money or anybody else's. Then you won't be able to run into this thing. So, the world, in my opinion, sometime they are going to have to adjust to this.

There are a lot of people talking about it now, again. For a while the bankers think they have the big upper hand on it, and sure it's very nice to write a note and say, "Okay, you owe me \$100,000 or one million dollars. Take that note." And

Huelsdonk: this guy takes it and he uses it to exchange as a collateral against some of the money, because it's \$100 in United States money, but if you haven't got the money to pay that, there is no way that that's secure, where a tangible, physical piece of gold is. Well, they argued over it quite a lot.

Well, then I went to France and I didn't get into Germany because I got mixed up with some of the South African deals. And I went to Spain. Now, Mrs. Best and Hazel, my wife, went over with us. I left them when I had these meetings that had been arranged ahead. When I went down to Spain, Hazel and Mrs. Best stayed in Madrid, while I went to Tangier. At that time the French were fighting the Arabs over there. They were having awful fights there. This fellow that I had the date with down there, he was right in the middle of this. So, he had to leave to get out of this tangle, because right over the hill from where he was, they killed twelve Frenchmen on the day before. And so, he came over and he got into Paris. Then he phoned and told me that. But I went on down to Tangier anyway, see, because I got other contacts, and I had gone all the way over there, I wanted to see it.

There was a lot of trouble there. There were Frenchmen and Arabs running around in the streets there, in Tangier--running around in circles, three of them, like that. And so I naturally got curious and I asked about it, and they said, "They are pledging to kill a Frenchman." That's how serious it was. Most of the women were leaving at that time. But, I guess they got it settled afterwards.

So, I got into Tangier, and very fortunately Fred Cassidy-- I don't know whether you know him or not, he's dead now. He had the Alpha Stores both in Grass Valley and up in Nevada City, and he was very well connected. He was a millionaire. So, he gave me several letters of people to see and one thing or another. Fred Cassidy's daughter knew a woman down in Tangier that they called Mrs. Tangier. The name was Maxwell, I think, Mrs. Maxwell. So, Fred Cassidy's daughter contacted this woman and said that I would like to meet some of these people, and she did a good job. I got to see a lot of people I wouldn't have seen otherwise. She knew the situation.

Swent: Were you meeting with bankers and politicians?

Huelsdonk: Yes, I met with all the bankers I could. Some of them, they avoided me, but most of them were central bankers too. But they know how to handle themselves pretty well. So, I could see right away that I was barking up a tree. Because they believed in monetizing debt. Sure, because they get a rakeoff on the debt. And they honestly think that they can keep that thing moving forever. But they are all going so far in debt, including the United States. You can't do it that way, I don't think, and I think it is sort of proving out. So, they are going to have to go back and you know what that will be. It will be a big increase in the price of gold.

See, in the meantime, we are losing all of our gold through a stupid program where we had an entire deal in hand because we had the most gold. But now, in settling a lot of debts we are losing our gold in the trade balances, and one thing or another. So, we haven't really got free gold like we had before, that's available.

I met no representatives from Russia, but some of these fellows I met talked about gold from Russia. I have it all written down. I made an oral report to some of our government representatives on it. It got some good response and some not so good. Some told me to keep out of their business. I said, "It's my business, too, because you are going to shut the gold mines up."

Anyway, I got some good addresses in France and England and Switzerland. I had three or four meetings in Switzerland. See, that's a banking deal over there. They were interested in gold, and they were interested in gold as a collateral to keep the value of money up, too, most of them. I was surprised on that, because I thought they were note guys, but they were very concerned. This Miami meeting was quite a while afterwards. And the reason I went is because they wanted that information.

Swent: Some of the same people were in that also?

Huelsdonk: Yes, so I got along pretty good. So, there are several of them still working on the thing, and I think they will come to common sense on it someday or they are going to have to get their credit situation better so people pay their debts. Because the bank lends them money, and they will pay some interest on it and in the meantime your country's federal reserve banks have put out federal reserve notes against it. So, that's all it is. It doesn't say "silver note" or "silver certificate" or "gold

Huelsdonk: certificate." It's just a Federal Reserve note. That means, "We will pay," but if they haven't got the money to pay, they can still use that money, its full value, as a gold dollar.

Swent: Did you ever go to South Africa?

Huelsdonk: North Africa, is all. I met these fellows, well, I met these fellows again in London, both Busschau and Dr. Diedericks. They came up especially to meet me, so I felt pretty good about that. It wasn't through my arrangements but several friends that I had. Some of them didn't want to be mentioned, getting into it. They were bankers. And, so it worked out real well. In Tangier, they believed in gold and all that, but they don't know how it's going to work. They are going to have to come to it.

Meeting Presidents Nixon and Eisenhower

Swent: Did you have any contact with any American presidents?

Huelsdonk: I met with Nixon, and I met with Eisenhower.

Swent: Downstairs, I saw the picture of Eisenhower that you have.

Huelsdonk: Oh, yes, and Nixon, too. I have a picture of him there shaking hands. He arranged for me to meet Eisenhower, and I talked to him about these things. Nixon was pretty well sold on the idea at first, but a person has to realize how busy those guys are.

Swent: Did you meet any other presidents?

Huelsdonk: No, I didn't meet Truman. It seems to me that I did, or I had an appointment with him but I don't know whether--his philosophy didn't impress me very much.

Swent: Roosevelt? Did you ever meet Roosevelt?

Huelsdonk: No, I never got to see Roosevelt.

Swent: What about unions? Did you ever deal with unions in your mine here?

Huelsdonk: A very little bit, but I usually hired people that I knew pretty well. They had down here what they called the Mine Workers Protective League, and this was separate from the CIO and AF of L. It was a sort of separate union. It was a pretty good union, because they would negotiate, you see, with reasonableness. First of all, you know your gold is set at a certain price, and you can negotiate your whole mine away by giving these things. And another thing was working conditions.

VI MINING GOLD AFTER WORLD WAR II

Labor Relations##

Swent: After the war, did you resume any mining?

Huelsdonk: Oh, yes. I came back to gold mining. See, these unions, you set up good working conditions and keep good relations with them. The small unions, you could keep out of trouble. Although they did strike on some of these mines at different times. But they are usually kind of reasonable, if you give them a reasonable situation.

Swent: This is a locally run group?

Huelsdonk: That's right. My method was to get acquainted with the leaders and talk to them about the thing and tell them what advantages would come in and tell them to think it over. All have got to give some, you know, to get. You see, there is no way to increase the value of your product when you sell it. You sell to the government, and, boy, that was the tag on it. Of course, your other materials have gone up a good part on account of wages, strictly in the rules, you know. So there has to be a balance in there someplace. My own opinion is that they treat labor pretty well, so they won't get in these real bad situations. I think there has to be some give and take in there and some agreement. I never had any labor trouble.

Swent: Never had a strike?

Huelsdonk: No. Even when the Grass Valley unions down here were striking, I didn't have any trouble up at the Ruby. I have had threats of it and all that, but they never went through with it. The

Huelsdonk: guys would threat, you know. You don't want to get mad at them. You call them in and talk to them two or three times and put your cards on the table. They were pretty reasonable.

Swent: Were there ever any labor troubles up around Downieville at the other mines?

Huelsdonk: Yes, they had some. At Brush Creek they had a little trouble down there, and that's the reason we were able to get ahold of it. I think they shut down on account of some labor strike. I'm not sure of that. Brush Creek was a pretty good little mine. I think it would pay off again now.

Swent: Where is Brush Creek?

Huelsdonk: Well, you know where Goodyears Bar is. Well, you go right up toward Alleghany on the Alleghany Road. You just go out of Goodyears Bar a little bit and you will see that the old mill is right there on the right hand side. Well, we didn't use that mill. We hauled the ore up to the Oxford Mill because that Brush Creek mill was an old stamp mill and was pretty much out of date and we had a tailings problem there. You would really have to pump your tailings up and put in a dam to hold them, and then that's not very satisfactory because a dam doesn't hold forever. And with your Forest Service fellows you're apt to get in a lot of trouble. But we had a dam already built during the war over at the Oxford Mine, and it was a modern mill so we just hauled it over down there.

Swent: Did you ever work at any of the southern mines? Southern Mother Lode?

Huelsdonk: Well, I was around when we were putting in Huelsdonk Concentrators in the Mother Lode and in there, like Angels Camp, Jackson, and most Mother Lode deals in there. See, they stayed pretty good. Those were lower grade deposits than, for instance, like Brush Creek, where you had richer ore in smaller amounts. But the deposits were pretty good and we could, by diamond drilling (which came in later), but even before by sample cutting, we could get a pretty fair estimate what your ore was going to run, and then you could measure it, cut a couple diamond drill holes up ahead to get the thickness, and you could estimate your ore reserves pretty well, and pretty close to the value, see, which gives you a better chance. That's why those mines ran so long and so consistently, against the ones up and around Alleghany and Downieville, where the mines were sort of erratic. Now, like the Sixteen to One Mine,

Huelsdonk: they get high-graded to beat the band. They had the biggest high-grade problems up there than any of them, I think, and from what you hear. Of course, it is all hearsay. But it produced a lot of money.

Swent: That was the last one to close?

Huelsdonk: Sixteen-to-One, I think it was one of the last ones.

Swent: It was very high grade?

Huelsdonk: Yes, it was high-grade ore, but when you got that high-grade ore, it was subject to highgrading,* too, you know. But they had provisions for it, and they got by with a minimum, I think, of losses. They had to.

Relations with Government Agencies

Swent: What about your relationships with the Forest Service? You mentioned them. Did you have many dealings with them?

Huelsdonk: Well, yes, if you run a mine in the Forest Service Reserve, you got problems with the Forest Service all the time. But we took care of them pretty well. We arranged dams and took care of our tailings. It would get stricter and stricter. I don't know what it would be today. So, we had already put dams up at the Oxford Mine during the war so we had our dams in and everything, and we could flow and store them. It was six miles to haul them up there in a big truck.

Swent: You hauled your tailings?

Huelsdonk: No, we hauled the ore up the hill to the Oxford Mill from the Brush Creek Mine. And the tailings pond, we already had that. That was right alongside the Yuba River. We had a good way of disposing of them, which was approved by the Forest Service. We had to get that approval first.

Swent: Did you deal with the BLM [Bureau of Land Management] at all?

*In mining parlance, "to highgrade" means to steal, usually nuggets or mill concentrates.

Huelsdonk: Yes, you had to deal with them, but we never had any trouble with them that I can remember. Except they would visit occasionally. But we always cooperate with the Forest Service. People don't realize that if you don't keep cutting these forests down a little bit, you're going to have a general [fire] finish it someday, you know. Then, they'll get a big wild fire that burns everything up. This has happened, and that is why you didn't have the general there before, because the nature of this is not like in Africa and some of those places where you have moisture and humidity all the time. But here, it gets so dry in the summertime and in the fall. You get a fire, and you get those top fires, and they'll burn the whole country off. And so, I think the Forest Service is a little negligent. They don't want anybody cutting trees down or anything. Well, the next thing you're growing scrub manzanita and everything there. You get a fire and you can't put it out, no matter what. You get one of those big winds and it gets conditions just right.

Supplies and Equipment

Swent: What were you doing for mine timber? What did you use?

Huelsdonk: Oh, we were fortunate. We had patented land. You cut your own timber. But we cut it according to regulation, so we wouldn't get into any trouble.

Swent: You did have your own timber supply right there then?

Huelsdonk: Yes, when you get your patented land, you own the timber, and you own the land and everything. But timber practice should be regarded, whether it is private land or not. We thinned the thing out and we cleaned all the brush and burned it in the fall. So, there was no chance for a summer fire. Some of those logging operations are a little sloppy.

Swent: Did you ever sell any logs?

Huelsdonk: No, we saved it all for the mines.

Swent: What about your power? What did you use for power?

Huelsdonk: PG&E [Pacific Gas and Electric]. We ran twice before we put the power line in, we ran with diesel power and a generator, with what we call the Lowry shaft. It goes down, and we pumped

Huelsdonk: that up, did a little prospecting, cleaned it out. And that's the one we connected in with the Ruby, and opened it for ventilation afterwards. And so we put a power line in and we had the power line hooked up, and then we had electric power. PG&E for a long time wasn't too reliable in that country, so you had to have a standby for your pumps and stuff, because the winter came and the power lines blow down, the timber goes across, and it takes quite a while to get it out of there. But they finally got it down to where the power was real reliable.

Swent: What did you use for standby?

Huelsdonk: Diesel generator. Just enough for them pumps, you know.

Swent: What sort of power did you use for your motors underground?

Huelsdonk: Battery. They run with the generator from outside, charging.

Swent: Those were Ingersoll Rand?

Huelsdonk: No, Mancha was the name of those. It's a current thing. You charge the batteries and then change the batteries. They are about a ton and a half. Your battery rolls off on that side and a new charged one goes on. Then you charge that one while they are at home. They were pretty good size. Actually they would haul-- See, we had in the main haulage tunnel two-ton cars, and we would use six of them going in. And these Manchas would pull. Of course, we had one heavier in the main haulage and that wasn't a Mancha. It was United States something.

Swent: Was most of your equipment made in the United States?

Huelsdonk: Yes.

Swent: You didn't have Swedish drilling or any of that?

Huelsdonk: No. American drills. Ingersoll Rand mostly, and Sullivan. Ingersoll Rand, Sullivan and Gardner-Denver. And we had them all. We had a trip of engineers in there all the time, checking the equipment. A little competition from the others. Gave them all something to do. And then you get a pretty good comparison. I think overall Ingersoll was probably the best, but not always. So, we had stopers and all that. We just dealt with those three companies. They had good sales engineers and made regular visits. They'd come on in and see how everything was going. See whether we were lubricating right and everything. Talk to the master mechanic, put the responsibility on him, and there was nothing to it.

Various Mining Methods

- Swent: Did you see changes in the mining methods? What were some of the changes in mining methods?
- Huelsdonk: Well, we didn't change much. We developed our own in this gravel. Because, I think I showed you a picture of some yellow scrapers. Well, I mean in the gravels we used Ingersoll-Rand double-drum scrapers. Then we'd drive a main tunnel out and put a branch out. Then we would put these chutes up, and we would scrape it right into the cars, rather than going in there. We would load them right on up.
- Swent: You worked two shifts a day, you said.
- Huelsdonk: Yes.
- Swent: When did you blast?
- Huelsdonk: Going off each shift. And the space would clear and air out. We had good ventilation down there. It worked out real well.
- Swent: What kind of explosive did you use?
- Huelsdonk: Mostly Hercules, but we did have some of the--what's that other one?
- Swent: DuPont?
- Huelsdonk: No. Hercules is a DuPont product. No, that one was a Solomon or another outfit.
- Swent: Did you use the same kind all through, or did they change?
- Huelsdonk: Yes, well, different strengths for the different rock. On the gravel we used the low grade, thirty percent powder, you know. It shook up more on it. Then, of course, in some of that you would have to drive lagging over the top and put your sets in, but you always have to have room for your train to go in. We would build these ramps up and scrape right into the train. We had Sullivans and Ingersolls. The Sullivan was a kind of a turbine one. They seemed to be best except the maintenance wouldn't hold up. The others had a little piston, air motors on it. But it wasn't enough that you could tell too much difference between them.

Swent: Did you use the same kind of mining methods in both mines?

Huelsdonk: No, of course, your quartz mine is different. You know your veins usually go up, maybe straight up. You put your chutes in. Then you shoot the stuff up, and it comes on down. Then you pull your train underneath enough to muck your ore, go into the train and pull on out. That is usually self-fed, if the veins are steep enough. Now, if they are not, you have to use almost the same thing. You use the scrapers. But see, we used to use them from two sheaves on the back, and that way you could pull the scraper either way and then scrape, with very little hand work. Of course, you had to go in with a spader and spade the roof down to keep it from caving. When you got one face cleaned up, you drill in there. You drill one wall and have that scraped for quite a while. Then you put your timbers up on there. Then you move in again.

Swent: You did shrinkage stopes?

Huelsdonk: No, shrinkage stopes, that's in the other ore. That's in your vein quartz ore. This you didn't shrink it, you shot it. It's almost on the level. It's just like going on a river bottom. The only thing that would bother you, you would go along here on the river bottom pretty good, and then there would be a pool in there that was put in there 100,000 years ago, or whenever it was. Then you would have to scrape to get that because the gold would be on the bottom, and then the water would get in there, so you would have to get a little air pump or something to keep it pumped out as long as you are there. Well, then you go moving your sheaves back over there to pull your scraper over, and pretty soon it doesn't make any difference. And you can fill that up with boulders. The bigger boulders we left right in there. Segregated. We had a little hoist. You would go both ways. Like this you bring on a V, and you just change the sheave. And they were drilling this side while they were mucking that side. And when they got that mucked out, they would blast this, and drill holes over there. You would go out to the edge of the rim of the channel. Just fan them out like this one. Bring it right into the main haulage. We had two main haulages. One was up in the level of the channel and the other was from there outside, because it was about two miles in.

Swent: Your haulage tunnel was beneath?

Huelsdonk: Yes, beneath there. Then we had a big long chute that we dumped that in, and then that train kept going a long time. That was a big train.

Swent: Did you have any problems with the water in the mines?

Huelsdonk: Well, if you were sinking shafts, you did. You see, on the quartz, it went on down. But very little on the gravel, because you would always have a drainage coming in. When I say you get one of those pools in there, well, it didn't take much to pump then out. But you had to get down to the bottom, because that's where the gold was.

It was interesting. Well, we sat around during the war. That was necessary. But it never worked out. And then, of course, there was a lot of other things. So, finally, we got interested in the Brush Creek. It paid off pretty well. And we just shut the Ruby down, took a loss.

Swent: Does the Best Mines Company exist any more?

Huelsdonk: Mr. Best is dead, and Mrs. Best is dead.

Swent: And that was it.

Huelsdonk: That was it. And I was getting too old to go exploring again. The company wound up its affairs and Mrs. Best could not really run it. As long as they were making it pay, Mr. Best was very generous.

VII A MINING CAREER IN RETROSPECT

Swent: Well, I think that perhaps you have answered all the questions that I wanted to ask. Are there other things that you would like to say?

Huelsdonk: Well, I don't know. I worked here at the Golden Center Mine in the early days. I ran the assay office for old Cooley Butler. Well, Cooley Butler, he was the fellow I talked to you about before. He had the manganese there. Then, he got some manganese and shipped it on down. And so that is when we got connected with Mr. Best. I couldn't see much future in this thing. It was moving around so much. And Mr. Best gave me a pretty good story, and I stuck with it.

Mrs. Huelsdonk's Background

Swent: Your wife is from Grass Valley also. So she must have come from a mining family, too.

Huelsdonk: Nope. Her dad was in the post office. She had a brother that was mining, I think, for a while, but he got killed, but I don't think it was in the mines. He was in an accident or something. That was before I knew her. But they [her parents] were a nice couple. Of course, they are both dead too.

Swent: She has always lived then in mining camps, mining places.

Huelsdonk: They lived in those homes over there in Grass Valley, over by the high school. Hazel went to this high school here, Grass Valley High School. I was initially accepted for a side course

Huelsdonk: up in Sierra City. Sierra City had a high school, but it only ran to the third year. And so, I had to make up a couple of credits, and I went up there while we were mining up at Sierra City. I got pretty well acquainted with this fellow, and so he got this straightened out for me, which was very good of him. He was a crippled fellow. He stayed at the hotel there, and I was staying at the hotel. Ernie Angus' hotel in Sierra City. The hotel is still there. So, I roomed there for a while, and he was boarding there. I was telling him about that, and he said, "I could make those up for you." You see the funny part of it is they only had three years in there. Well, these were four unit credits, and I made them up in history.

Swent: So, you actually graduated from Mission High in San Francisco.

Huelsdonk: I had quite a time getting those credits straightened out. It finally worked out. Old Drew was the principal down there, and this guy's name was Hansen. He was a professor up there. But I don't know what ever became of him. I think he must have died too, because--he wasn't a real old guy, but he was handicapped. He was a good teacher.

Swent: Are there any other people around here you would recommend my talking with? I don't think anybody knows as much about gold as you do.

Huelsdonk: Well, I don't think there's anyone left. But they will, they will open these mines again. I know darn well.

Swent: What about the environmentalists? They are preventing it.

Huelsdonk: Well, this is the thing they are going to have to deal with.

The Case for Gold

Huelsdonk: The price of gold will have to go high enough, but they are going to need gold, in my opinion. They are going to need gold in this monetary system, all through the world, and it seems like (it's been used for centuries you know), it seems like the only thing that doesn't oxidize, doesn't rust. It will melt in the heat, but it doesn't burn up like a lot of other metals that get oxidized, and so for keeping, it's really worth quite a bit.

Swent: Certainly, there are many nations in the world, in Asia and in the Arabic countries, that appreciate the value of gold.

Huelsdonk: That's right. They could get enough gold and make it so it wouldn't be overvalued or anything like that. Keep it the same, and the exchange rates the same. The world is getting small. People don't realize that. And, you are going to have these exchange rates or you are going to go under, you see.

Swent: What do you think would be a fair value for gold right now?

Huelsdonk: Five hundred dollars an ounce. It's too cheap at \$340. But another thing is it's not stable. They are bidding on it, bringing it up and down. To have a standard, it should be stabilized at the best price they can and then maybe a readjustment if they start overproducing it or something. But that readjustment would be convertible into an ounce of gold or whatever it is. So it keeps all currencies--your exchange rates--the same on it.

Swent: It's stayed down around \$350 for quite a while now.

Huelsdonk: Yes. But it runs up and down, and you know, they are kind of bidding on it, and they trade. A lot of people don't know. Dr. McLaughlin has about the best setup on the whole thing, knowing what it's all about, because he has been in the business a long time, and he knows. I have been on several committees with him at different times, and I learned a lot from him, from talking to him.

Swent: Are there any other mine operators around here in Grass Valley, people who operated mines?

Huelsdonk: Not what you could call operators, I don't think. You've got these fly-by-nighters that come in and set up shop. They don't know much about it, because they haven't got the engineering ability or anything else. They come in, and they'll go down and call themselves a mine and sell a lot of people stock. You would be surprised how gullible people are. Terrible.

But, I'm satisfied that these mines haven't been exhausted. They were shut down at \$42 an ounce. My God. And I kept telling them back there in Washington, in the talks that I gave them back there, that it would go to \$300 or \$400. They just laughed at \$400, those guys at the Treasury Department.

Swent: Did you have any recourse on the L-208 shutdown? There was no one you could complain to or no protest procedure?

Huelsdonk: Oh, yes, we protested, but it didn't go anyplace. It was on account of the war, see.

Swent: Were you part of the suit? There was a big lawsuit afterwards. Did you get involved in that?

Huelsdonk: Best Mines, did, yes. But it didn't get anyplace.

Swent: No, they lost, of course, but it went on for years.

Huelsdonk: Oh, I know. I've got a whole pile of correspondence. I've read about it. The Treasury Department-- They never did get it settled, they don't know yet, really. But for some reason, they are all scared of gold, and it's the only thing that will stabilize the whole industry throughout the world. It doesn't make any difference whether you are a Chinaman or Japanese or anything else. If your currency is exchangeable at the given rate, based on gold, then you're all right. You know what it's worth. But now, you never know what the false currencies are going to be worth.

Fishing

Swent: I am interested in your trophy on your TV. What is that?

Huelsdonk: Oh, that's for fishing. Yes. The biggest trout in the Downieville area--I was the 1950 champion.

Swent: Trout fishing?

Huelsdonk: They have a big derby up there every year. I got this fish, about 28 inches long, the trout, a great big heavy one. Boy, I was frightened I was going to break the line. So, I got it up and took him down and entered him in the thing. And so, it won the trophy. A few others were pretty good sized, but none could even compare to this. They have that derby every year.

Swent: What kind of trout was it?

Huelsdonk: It was a German Brown.

Swent: They stock the streams up here, do they?

Huelsdonk: Well, no, German Browns are native up there, and your rainbow trout. Now, they are stocking them. I don't know, mountain trout of some kind. They haul them up, the Forest Service and the Fish and Game. They dump them in barrels all over the streams, and so it's not like it used to be. They don't get a chance to grow very much.

Swent: In the days when you were mining, you didn't tangle with the marijuana growers either, did you?

Huelsdonk: There were no marijuana growers anywhere. They are up around North San Juan and those places.

Swent: Now they are?

Huelsdonk: Yes, but still, they haven't got it under control yet. They are trying. They arrest a bunch of them every once in a while.

Some of a Mine Manager's Challenges

The Bunkhouse

Swent: Did you ever have any troubles with miners drinking?

Huelsdonk: Yes, but not major problems. I avoided that by looking up the records ahead of time, you know. But once in a while one would slip in, and some wouldn't necessarily have to be drunkards, but get too much to drink on a Saturday night and come back and throw up in the bunkhouse, or something.

Swent: Well, I was thinking of safety underground.

Huelsdonk: Oh, no, we had them all inspected, just as a matter of routine, so they wouldn't get insulted if we picked on one sometime.

Swent: On the way in.

Huelsdonk: Before they would load up in the man car to go in we would check them, every day.

Swent: And, if somebody had been drinking, what happened?

Huelsdonk: They wouldn't let him go in. He would have to go up to the bunkhouse and sober up, and some of them were all right, that way. But see, you have got to keep that out of the thing especially bringing it around the cookhouse and everything. The cookhouse was more trouble than the mine. The guys thinking about the menu. And then, if they get drunk, well then they get nasty. Well, sometimes they do. We didn't have much of that. I think it was because we were a little more selective in getting in.

Swent: You allowed booze in your bunkhouse?

Huelsdonk: We never had any restrictions against anything. To administrate all those restrictions then, they get their neck bowed. So, I would tell the foreman to just kind of watch and make sure, and not to fight with any of them.

The Cook

Swent: Where did you get your cook from? Sometimes it's hard to keep a cook in a place like that, isn't it?

Huelsdonk: Yes, cooks were the biggest problem. And we had two or three flunkies. They were younger people. We got them through the employment agency down in Sacramento. That was the only place you could get them. So we had our name in there all the time. We didn't have to change too many. After they get in there for a while. Winter is the worst, see, because they are in there all the time. And we had more trouble with the cooks drinking than the miners. They would get a little sloppy. But the miners all knew when they did.

Swent: The cook had to work seven days a week?

Huelsdonk: Yes, but he got pretty good pay. And he would go out with a stake and then get vacation pay. So, it worked out. I have to say that compared to a lot of them, it worked out pretty well at the Ruby. And we had good facilities there, modern stuff.

If you wonder how we got the modern stuff, well, Caterpillar Tractors had a cafeteria down there, and so they had all these extra aluminum tables and fancy stuff. And so Mr. Best sent it up to the mine. We installed it, and that made a hit with all the miners. Everything clean. And then, of course, we had real restrictions on cleaning up the bunkhouse.

- Swent: Where did you get your supplies in for your food?
- Huelsdonk: Well, see, we hauled them in from Sacramento.
- Swent: Did you have to oversee this, or did you have somebody else who did it?
- Huelsdonk: Well, the cook. I had to oversee the whole thing to keep order and everything and to let them know the restrictions and what not. But the main thing is to get a good cook who pays attention and then get the guys to brag on him a little bit and it was fine.
- Swent: Did the cook have a budget?
- Huelsdonk: No, we never had a budget.
##
- Swent: You were just saying it was harder to run the bunkhouse sometimes than the mine.
- Huelsdonk: Yes, a little more trouble because fellows had their duties lined up down below and they had a schedule. But sometimes things get upset in the cookhouse.
- Swent: But, your wife never had to get into the buying or the management of that?
- Huelsdonk: I had a timberman that worked outside, and he was a good cook too. He could drop in the kitchen and substitute. They all liked him, but that's because he wouldn't stay there too long. Then I would phone right down to Sacramento to the department that would send the cooks out and the flunkies. They were professionals that would come in. Well, I would pay them a little bit more than what they were paid ordinarily on account of the backwoods position, a little bit. Then they would get up there for a stake, you know. And probably, it wasn't too bad, in the time I was up there. We had several cooks. Some of them would last a year and maybe more.
- Swent: And you were up there thirty years, you say?
- Huelsdonk: No, no. I was up there seven, and then moved to Downieville and ran those other mines.
- Swent: You were in Downieville thirty-seven years?

Huelsdonk: Yes. Including the two mines in Brush Creek. You know, Brush Creek had that office. I showed you the pictures. That was in Downieville. We put that in there. We put a big safe downstairs. A concrete safe for the gold.

The Accountant

Swent: You were starting to say the accountant was so important also.

Huelsdonk: Well, yes. I had a fellow up at the Ruby. He was a man, and he was pretty good. He was a pretty good accountant. And, of course, when I got to Downieville, I had this Margie Steinmetz. She was a real good accountant and secretary, good typist and all that. So, I would throw all the work onto her. Hazel was a pretty good typist. I wouldn't trust old Hargrove--that was the accountant's name--but he knew accounting. Income taxes are awful important, you know. Especially if you lose money for a while and have to account for it. Because if they think you're losing money, you get the FBI up there right away--not the FBI, but the accounting outfit. And you have to do it, because you have got to get your deductions on your production. It's very important to get your bookkeeping right, so you don't meet the contest. So if you have a loss, you sure want to get it in there because at the end of the year you want to deduct it as an operating expense. It's no more than right. It should be that way, but you have to be awfully careful because they come in every year to a mine like that. The government inspectors come in and go over the books.

Swent: Which branch of the government is this?

Huelsdonk: The Treasury Department. On account of income tax. You see, you get a certain set of ore reserves, and as you mine them, you are depleting these ore reserves. You can also get this depletion write-off. So, if you don't discover and get more in the meantime to take its place. Then, as you develop, then you run a raise up on this ore, then you can make your estimates on that. Then you can write off your development work. In mining today, those are awful important. You can't cheat on it. You have got to have that. They check real close.

Contract Miners

Swent: In your regular mining operations, did you do contracting?

Huelsdonk: I put a lot of work on a contractor except the stuff that you want to supervise real well. When you run a cross-cut out, you get regular skilled men to do that. I had three or four lined up, and they would come in and take contracts for so much a foot. We would furnish the power and the powder and all that and for their labor they figured they should make about fifteen or sixteen dollars a day on it. But, boy, it was cheap compared to what you could lose--they were not cheap, but they were good talents. And these fellows were real skilled. They knew how, and they were conservative on powder and everything else.

Swent: Your ordinary miners, they didn't--

Huelsdonk: Skills like stoping, running raises, and sinking shafts. You could get good shaft contractors back in those days, too. We sunk the shafts I think at \$40 a foot, and that was a two-compartment shaft. And old Bert Austin came up there one time and said, "How much does it cost to run that?" "\$26 a foot." He was paying \$60. So, then he wanted these guys (I'm trying to think of the name of the guy that's the head of it)--from Jackson. He would hire his own men and then go get the contract. And then arrange for them to go up and sink the shaft.

He was a quicksilver miner over at the coast, you know. And they did a satisfactory job for him, too. They get real skilled on that. They know just what they are doing. They don't have to talk. One guy knows how to put the mixers in, the other one how to cut holes, and the other back holes, you know. And they blast it going off shift, you know. And they break it right to the bottom. And it doesn't take much picking down to start drilling again. And we had mucking machines for them to move it, see. That's the toughest part, is mucking those blasts. You have to muck out twenty some cars by hand, you know. A muckskipper could run in and do it in a half an hour or more with one of those little mucking machines, those little Eimcos. They just get more rock and cart it right back over into the car.

Swent: They are wonderful machines, aren't they?

Huelsdonk: We had about four or five of them around there. Then we had a big one--I want to call it a Universal, I've forgotten. It's been so very long. But I expect these mines to open up again.

Huelsdonk: But, they can't the way the wages are now and the way the price of gold is. Still, it sounds pretty good when you-- The costs are way over ten times what they were before, when it was \$35.

Swent: I don't suppose there are any skilled miners around here anymore, are there?

Huelsdonk: Not any experts. They even stuck that up at the Ruby. Of course, that was a little different kind of mine.

They put in cut holes and diamond holes, you know to shoot the center off so they can break it in first. These fellows get pretty skilled.

Swent: Thank you very much, Mr. Huelsdonk. I have enjoyed hearing about your experiences and views as one of the long-time experts on gold mining in California.

TAPE GUIDE -- Lewis Huelsdonk

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- B. Excerpts from "Placer Mining for Gold in California," California
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Million-Dollar Mining Memories

Fifty years ago, another gilded age began



In five years down in the Ruby Drift Mine, Huelsdonk and his men found 50,000 ounces of gold that today would be valued at about \$20 million.

BY TOM GRAHAM
CHRONICLE CORRESPONDENT

Goodyears Bar

The gold that Lewis Huelsdonk and his men began removing from the old Ruby Drift Mine 50 years ago is not ranked among the largest strikes in California's gilded history, but the ore that was collected remains in a class by itself.

"There's nothing like it in the world. It's the world's largest and finest collection of placer gold, there's no question about it," says Huelsdonk, 81, without a hint of immodesty.

The 159 gold nuggets — weighing a total of 1,000 ounces and assayed as 96 percent pure gold — are worth \$1.5 million. This storied collection has been on display inside a darkened vault at the Old Mint Museum in San Francisco since 1974.

"We were following a quartz vein, which was a pretty good little prospect, when we hit onto something a little further up the channel," Huelsdonk recalls.

"Where the channel made a swing and a big 'S' turn, that's where a good portion of the gold nugget collection came from. The heavy gold you could sometimes see impregnated in the gravel along the bedrock there."

How did it feel to reopen a Civil War-era mine and — through planning, perseverance and perspiration — come up with the largest gold nugget collection in the world?

Huelsdonk's voice falters. Tears well in his eyes. "Great. . ." is all he can say.

Now living with his wife, Hazel, in Grass Valley, surrounded by the mountains that he spent most of his career mining, Huelsdonk remembers the 1930s and '40s as a time when the treasures of the Sierra Nevada were at his fingertips.

Hired in 1934 by Clarence (C.L.) Best to reopen a mine that was last operated in the 1860s, Huelsdonk

supervised the excavation of what would later become known as the C.L. Best/Sierra County Gold Nugget Collection.

C.L. Best, the colorful co-founder of Caterpillar Tractors Inc., was an East Bay industrialist and inventor who owned cattle ranches and interests in oil wells throughout California and Nevada, as well as several gold mines in the Sierra. Best, an entrepreneur who dabbled in mining, and Huelsdonk, a miner like his father before him, decided to team up to complete what earlier miners left unfinished nearly a century before.

Those were days when miners never saw the light of day. The men at the Ruby worked in shifts around the clock, even in the dead of winter when there were huge snowdrifts outside. In the cold and dank atmosphere of the mine, Huelsdonk's crew of 40 men searched for the elusive treasure.

It took crews two hours round-trip just to get to and from work. Flat cars pulled by battery-powered locomotives transported 12 men at a time from the mine-entrance down the damp and narrow main shaft to the diggings.

After blasting and drilling and moving mountains of rock, they finally hit pay dirt.

"We explored into some of the old channels that the earlier miners had worked and we found that the old-timers weren't so dumb after all," Huelsdonk says.

The Ruby Mine, which is 3½ miles up Rock Creek from Goodyears Bar off Highway 49, produced all of the nuggets in the gold collection and more — in all, about 50,000 ounces, which today would be valued at about \$20 million.

Hazel Huelsdonk, 78, Lewis' wife of 54 years, left a quiet life in Grass Valley to join her husband at the Ruby Mine in 1935 and lived there until it was closed during World War II.

"I don't think I would have ever made a good miner," she recalls, not



Hazel Huelsdonk's bracelet of gold nuggets.

The mint's moving exhibit

The gold nugget collection from the Ruby Drift Mine is on display through May 17 at the Natural History Museum of Los Angeles County, where it is part of one of the largest gold exhibits ever assembled in the United States. It will return to Old Mint Museum in San Francisco, corner of Fifth and Mission, this summer.

The mint museum still has on exhibit gold bars weighing more than 10,000 ounces and valued at \$4 million. The Old Mint Museum is open 10 a.m. to 4 p.m. weekdays. Admission is free.

The Los Angeles exhibit, titled "Gold: The Quest for New World Riches," includes the largest gold nugget ever discovered in California (the 156-ounce "Mo-have" nugget), spectacular examples of leaf and crystallized gold, pre-Columbian gold objects, gold coins and jewelry salvaged from sunken Manila galleons and 19th-century gold mining artifacts from California and the Klondike.

The Natural History Museum's gold exhibit is open from 10 a.m. to 5 p.m. Tuesdays through Sundays. For more information, call (213) 744-3466.

too enthusiastically. "I wasn't crazy about going underground. It's dark and wet and eerie, and I was always glad to see daylight. Lewis was used to it because he was underground a lot. I rode into the Ruby Mine once on an ore car and looked about and rode out. The men were working. They were drilling and it was dirty and noisy . . .

"But Mr. Best had an apartment built for us and we had a dog and I would walk the dog. I helped Lewis in the office a little. I wrote letters for him and took care of all the paychecks for the men. I kept busy with housework and fancy work — I made quilts and embroidered and I read and cooked our meals — and the time went fast.

"In summer it was lovely up there. In winter, though, we had an awful lot of snow. We had an apartment over the office on the second floor, and the last winter we were there the snow was 14 feet high — I could open the window in our bedroom and the dog could go out the window right on top of the snow."

When they wanted to go to town, they had to take a trail about 3½ miles down to Goodyears Bar.

"During the winter, Lewis would ski out and I would walk on the snow over his tracks. There were quite a few times when I had to use Bear Paws (snow shoes)."

All of her memories of those Ruby days are not of hardship, however.

"C.L. Best was a wonderful person. Very kind and considerate. He had a good sense of humor and he treated every one who worked for him very nice. I have a nugget bracelet that Mr. Best had made for me. The nuggets came from the Ruby Mine. He gave it to me when they hit the channel."

C.L. Best died in 1951 at the age of 73. Shortly after his death, his wife, Irene, sold the mine. In accordance with his wishes, his wife agreed to sell his gold collection to Sierra County in 1952 for \$32,013.38. It was, no doubt, the best investment the sparsely populated rural county ever made.

Huelsdonk says that when the mine closed in 1942, the year that the War Production Board closed all gold mines in the United States and redirected mining efforts toward strategic minerals needed for

the war, his men were right in the middle of a rich gold field.

Like a book left open, it appears that the final page of this chapter on the Ruby Drift Mine has yet to be written.



FIG. 95. Gold nuggets from the collection of C. L. Best, mined at the Ruby drift gravel mine, Sierra County, California. Total weight, 899.15 troy ounces; total value \$30,037.65. Photo by courtesy of L. L. Huelshondt, superintendent, Ruby mine.

The Ruby mine was being operated in 1941 by C. L. Best, Caterpillar Tractor Company, San Leandro, with L. L. Huelsdonk, Goodyears Bar, in charge. Including a lease on the Mott property, there are 1,150 acres, of which 300 are patented, in secs. 10, 11, 14, 15, T. 19 N., R. 10 E., M. D. The mine is reached by 15 miles of road from Downieville, mostly steep mountain road, dirt surface.

The Bald Mountain Extension channel, one of the oldest Tertiary channels, branches from the Bald Mountain channel at a point north of Forest. Bald Mountain channel is the same as the Ruby and City-of-Six channels. The last two named are simply continuations of the Bald Mountain channel to the north. The Bald Mountain Extension channel was worked in the Ruby mine in the nineties from an adit level driven from the side of the mountain on which the town of Forest is located. Present work is on the opposite side of the mountain. An old adit level (portal elevation 4,707 feet) was utilized for a distance of 1,800 feet. Work beyond that point is new. The adit is in the Tightner formation for 3,320 feet, then in serpentine for 520 feet, then in gabbro and schist for 610 feet, then passes into a second belt of serpentine. A point in the adit is 1,850 feet south of the common corner of secs. 10, 11, 14, 15, T. 19 N., R. 10 E. The contact of the second belt of serpentine and the gabbro-schist is 200 feet east of the point in the adit just described. The adit then continues in a general southeasterly direction to a point where a raise was put up to the intervolcanic channel. Distance from the portal to this raise is 5,850 feet and the raise is 109 feet high. From the top of the raise 400 feet of drifting was done in a southerly direction on the channel and 4,000 feet in north and northeasterly directions on the channel. From this point the channel winds considerably, and 700 feet more of driving will be needed to connect with the Larry shaft, of which the collar elevation is 5,163 feet and the bottom elevation is 4,954 feet. Several thousand feet of additional exploratory work have been driven on the channel, and a connection for air, involving 3,000 feet of work, has been made to the Golden Bear shaft.

The intervolcanic channel that is being worked is 200 feet lower than the Bald Mountain Extension channel and cut off the Bald Mountain Extension channel. Apparently much of the gold in the intervolcanic channel was derived from the older channel. The intervolcanic channel varies from 60 feet to 160 feet in width and is breasted to a height of 6 to 8 feet. Channels are capped by as much as 900 feet of lava, which is mostly andesite, but basalt is found on top of the andesite in places. Large boulders are stored underground. The finer gravel is moved by slusher scrapers to raise-chutes and hauled in trains by storage battery locomotives to the washing plant at the portal of the main adit level. Timbering comprises stulls and caps specially designed with a mortise and tenon and hauled by one man.

In the summer of 1941, the crew comprised 18 men, and 80 to 100 tons of gravel were treated per day, but when the crew was 43 men, 200 tons were treated per day and a maximum of 250 tons was reached. The reason for the small crew in 1941 was that many men had left to engage in defense activities. Gravel passes from storage bin over Hungarian riffles of alloy steel 50 inches wide by $1\frac{1}{4}$ inches deep; then to a vibrating screen, which is a double screen. The upper screen is of 2-inch square openings, and rods are half an inch in diameter. The screen which is below is four-mesh of No. 12 wire. Undersize goes to a six-unit Huels-

donk table 20 feet long by 7 feet wide. The washing plant will treat 500 tons of gravel per 24 hours. The screen mentioned above is vibrated by an eccentric and 20-hp. motor with a $3\frac{3}{4}$ -inch stroke at the rate of 200 vibrations per minute. Undersize goes to the Huelsdonk table mentioned above, which is vibrated with a $\frac{3}{4}$ -inch to 1-inch stroke at a rate of 200 vibrations per minute. The end of the table farthest from the vibrating screen is set three-quarters of an inch lower than the end near the screen. Recovery amounting to 10 to 20 percent of the total is made on this table as fine gold. The remainder is made on the first riffle and the screen about equally divided. Steel bars are placed across the screen to hold it down and these have a tendency to act as riffles. Below the screen additional riffles are provided in the sluice that carries away the oversize, but little gold is recovered from these. Nuggets as big as 52.33 ounces valued at \$1,758 have been recovered. C. L. Best is saving all nuggets above \$100 in value for exhibit purposes and in 1941 had a collection of 123 that had been recovered since 1937. Gold is 940 to 950 in fineness. Most of the tailing is stacked on the property by means of a belt conveyor.

The second serpentine belt mentioned above is 490 feet wide, then the workings pass into the Blue Canyon slate, which is the bedrock of the channel being worked. On the contact of the second serpentine belt and the Blue Canyon formation is a fault called the Independence, on which is a 6-foot quartz vein. Another quartz vein 4 feet in width was cut 110 feet farther ahead in the adit in the Blue Canyon formation.

A third vein known as the Wolf vein strikes north and dips 65° W. It is 6 inches to 12 feet in width. This vein was worked in the years 1935, 1936, and 1937 to a depth of 200 feet below the main adit level. Drifts were run north on the 200-foot level for 600 feet and the ore was stoped through to the main adit level. This work on the quartz vein had been discontinued and the workings are now full of water. Ore was treated in a stamp mill of 30 tons daily capacity, and treatment was amalgamation on plates followed by tables and flotation. The quartz averaged \$5.80 per ton in the mill but additional gold was recovered as high-grade. This vein is in the Tightner formation and was found at a distance of 2,120 feet from the portal of the main adit.

Camp facilities are provided for a crew of 40 men, and the property is well equipped with repair shops, drill sharpeners, air compressors, and other modern machinery. Electric power is supplied by Pacific Gas and Electric Company.

A SYNOPTIC PRESUMPTION
REGARDING CALIFORNIA'S DRIFT MINES

By L. L. HUELSDONK*

In years past, including but not considering the war and closing order L-208 of the War Production Board, there have been many theories advanced, from the rapid extinction of the old-time gravel miner and the inability of the present generation to absorb his art to the exhaustion of the ancient river channels, for the sick condition of the California-sired and once booming drift mines. The actual reason is without doubt economic, and depletion of the easily accessible channels is probably the chief contributing factor. However nearly all of the successful drift mines operated at a time prior to the epoch of laws, rules, regulations, restrictions and taxes governing compensation, unemployment, social security, sales, income, corporation, labor, forest, water, transportation, tailings, and many other seemingly unimportant riders regulated under some admixture of the ABC's which directly or indirectly affect present-day operations.

In the so-called 'good old days' a drift miner often wore knee-pads, worked long hours under a goose-cooker, back-filled boulders and waste and loaded only select pay dirt into his breast buggy. This was transferred to cars and trammed to the outside washing bins by Chinese labor where even in the larger mines, the superintendent had the time and did in most cases wash the gravel and make the clean-up. He fed the white miners beans and the Chinese rice, and if after meeting the payroll and bills an ounce of gold remained the mine was a profitable one. He needed no accountant, income tax expert, attorney or engineer to estimate ore reserves, values, percentages of depletion or other incomprehensible guesses to determine if the profit was actual or merely one on paper.

The foregoing is not an advocacy for the return of the 'good old days' or is it without exaggeration or exceptions. Its main intent is to express in brief generalities, for comparable purposes and the sake of argument, conditions that existed during California's early-day drift mining history. As a conservative estimate these mines had an over-all cost of possibly \$3.50 to \$4.00 per man-day as compared to an immediate pre-war average of \$10.00 and a probable \$15.00 post-war outlook. This means simply that on the basis of a 50-man crew the early day operation had a monthly cost of approximately \$5600.00 as against \$15,000 in the late 1930's and \$22,500 for crystal ball operations. So in order to keep the unit cost of gravel washed on an equal basis it will without much doubt be necessary for the post-war operator to wash four times the number of units per man as did the old timer and one and one-half times as many as those washed just prior to the war. In comparing these (excluding tax and other ABC nuisances which have been included in the man-day costs) many other factors must be considered, such as the highly publicized \$35.00 gold and the possibility of a future increase, the amount of waste mined with pay, the efficiency of up-to-date equipment and

* Superintendent, Ruby mine, Downieville, California. Mr. Huelsdonk explains in a letter that these remarks apply to drift mining in general and that exceptions exist, such as the Ruby, where rich beds of coarse gold are found; but that these have little bearing on the industry as a whole.

machinery, working hours, modern explosives, high-grade control, gold recovery, management and engineering facilities. Since most of these are incidental we will consider only the first group, that is \$35.00 gold, its possible increase, the efficiency of modern equipment and the ratio of waste to pay mined. The old timer mined very little waste, he worked by hand, the gravel was prospected, he skipped the poor, mined the good, and at times took only a few inches of bedrock gravel by back-filling waste and leaving just enough room to work. Even if the post-war man would submit to this type of mining the over-all cost per miner would without doubt be prohibitive and therefore any post-war drift mine plans must include the use of modern equipment if success is to be reasonably expected. However, this is not an over-all answer or is it without drawbacks. What we might consider modern drift mining equipment are mucking machines and slusher scrapers supported by various accessories such as power augers, jack legs, air bars, drifters, electric locomotives, etc. To begin with, even the smallest mucking machine requires a seven-foot high face to work in and if in a timbered drift, eight feet. It requires a track, and grade must be maintained. Its operation cannot be held up while boulders are sorted out and back-filled, as its prime purpose is a muck mover and any delays must be proportionately charged to costs. Also since the bulk of the gold lies on the bedrock or a few inches above it in most drift mines, breasting with a mucking machine usually causes undue dilution. Its use, however, is indispensable around the modern drift mine for running bedrock tunnels and where applicable for opening up ground for slushing.

By breasting with slushers a fairly moderate roof height can be maintained. This must, however, be at least five feet in order to make working room and conform substantially to modern working conditions. By using blasting boards to keep from scattering the pay over the worked-out areas and at the same time utilizing them for a scraper way during the mucking cycle a good condition is created for back-filling boulders in the open breast. Heavy rocks can be pulled over the boards by use of the tugger and a chain net sling. A scraper also has the advantage of following over irregular bedrock (when the gravel is reasonably dry) without grade or drainage. It is also a good bedrock cleaner when properly applied. In other words, the slusher, under ideal conditions is a hard combination to beat for breasting purposes. It is not however, without faults and disadvantages. The scrapers have a tendency to cut and follow troughs in the broken gravel making it hard to crowd the face and mechanically clean up the breast for drilling. In wet ground they stir and mud the gravel making a sticky mass which is very difficult to handle in the chutes, cars and ore bins. Under these conditions they sometimes bury themselves and cut deep into the softer bedrock spots forming puddle holes which catch more water and tend to further wet the muck. Also selective breasting cannot be carried on successfully as the main theme must be the spirit of high production and low costs and therefore the drilling and mucking cycles cannot be interrupted. In other words with a hundred-foot breast face with fifty feet averaging \$6.00 and fifty feet averaging 10 cents the entire length must necessarily be taken rather than rearrange set-ups to take select sections. This further tends to dilute the pay when comparing it to the old-timer's work. Also tugger stations contribute waste and their setups absorb man power.

In summing these groups we might say that modern breasting, no matter how closely guarded, will add an equal amount of waste to the pay gravel mined by the old-timer, so therefore, although the present price of gold is \$35.00 per ounce it has a modern drift mine value of only \$17.50 as compared with \$20.67 for the old-timer. Consider with this the four to one mining ratio anticipated for post-war operations and the gold for this operator will have a value of less than \$5.00 per ounce on a comparable basis. In other words, to balance the two periods, the post-war drift mine operator should get \$41.34 per ounce for his gold to compensate for dilution necessary with modern methods, and since he will be required to wash four times the amount of diluted pay dirt to obtain an equal unit cost he should receive a total of \$165.36 per ounce for his gold to reach the boom basis of the drift miner's heyday.

These figures, although subject to considerable variation, will serve in a general way to explain the sick condition of California's drift mines. Providing that gold remains at its present value or enjoys an increase with a compensating sur-tax the post-war drift mine operator, in order to effect a cure, must be a strong-minded, hard-headed doctor willing to suffer public criticism by experimenting with and practicing ultra-modern methods such as the rapid back-filling and tamping of waste into the 'worked-out' areas by specially designed machines that will insure safe working conditions and eliminate to a great degree one of the industry's main bugaboos, the expense of timbering. He will have to work out a ratio between the expansion of his broken ground and the tightness of his back-fill whereby he will be able to haul out and wash only his richer bedrock gravel and thus minimize transportation and milling costs. His development program must be carefully laid out and his plans must include the mining of the entire bedrock area as there can be no applied rule for following the pay streak in this type of mining and as some gold usually spreads over the bedrock aside from the run of gold the effort would in most cases be compensated for by low mining costs.

The small amount of gold accompanying the upper gravels which would go into the back-fill would no doubt be cheap pay for the fill material.

In conclusion, it might be generally said that if gold remains on a par with its present value and if the post-war drift miner is to enjoy the higher (or any) income tax brackets, he must develop and adopt a more streamlined mining system rather than knock his brains out against Davy Jones' locker with the present day conventional methods.

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Eleanor Herz Swent

Born in Lead, South Dakota, where her father became chief metallurgist for the Homestake Mining Company. Her mother was a high school geology teacher before marriage.

Attended schools in Lead, South Dakota. Dana Hall School, and Wellesley College, Wellesley, Massachusetts. Phi Beta Kappa. M.A. in English, University of Denver. Assistant to the President, Elmira College, New York. Married to Langan Waterman Swent, mining engineer.

Since marriage has lived in Tayoltita, Durango, Mexico; Lead, South Dakota; Grants, New Mexico; Piedmont, California.

Teacher of English as a Second Language to adults in the Oakland, California public schools. Author of an independent oral history project, Newcomers to the East Bay, interviews with Asian refugees and immigrants. Oral historian for the Oakland Neighborhood History Project.

Interviewer, Regional Oral History Office since 1985, specializing in mining history.