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University of California  
Berkeley, California

Western Mining in the Twentieth Century  
Oral History Series

Günther Franz (Frank) Joklik

EXPLORATION GEOLOGIST, DEVELOPER OF MT. NEWMAN MINE,  
PRESIDENT AND CEO OF KENNECOTT, 1949-1996;  
CHAIRMAN, 2002 OLYMPIC WINTER GAMES COMMITTEE

With introductions by  
C. John Sullivan  
Dr. D. D. Brown  
Ivor G. Pickering

Interviews Conducted by  
Eleanor H. Swent  
in 1993 and 1994

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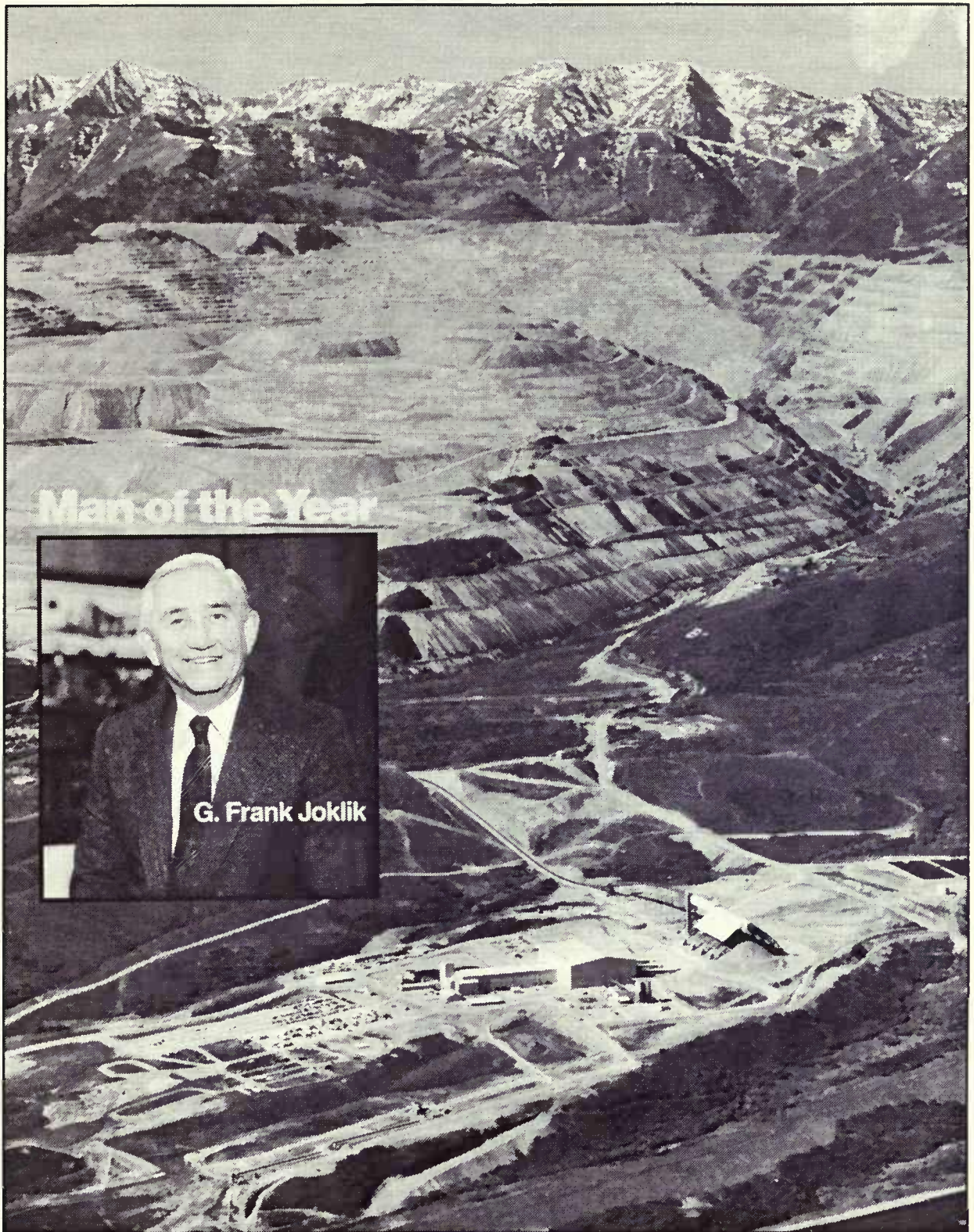
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G. Frank Joklik, 1989. Bingham Canyon Mine, with the new Copperton Concentrator in foreground.

Cataloguing information

JOKLIK, Günther Franz [Frank] (b. 1928)

Mining company executive

Exploration Geologist, Developer of Mt. Newman Mine, President and CEO of Kennecott, 1949-1996; Chairman, 2002 Olympic Winter Games Committee, 1997, xix, 395 pp.

Family background in Vienna; education, Cranbrook School, and University of Sydney, Australia, 1938-1944; exploration geologist, Bureau of Mineral Resources, Ph.D. thesis, pegmatites of Harts Range; Fulbright scholar, Columbia University, 1953-1954; Kennecott Copper Co., 1954-1963; exploration geologist, project manager, Canada, Australia, harvesting manganese nodules; first Harvard Business School Program of Management Development, 1960; AMAX, 1964-1973: project manager, Mt. Newman iron ore mine, Borneo copper prospect, Kimberley bauxite-alumina, vice president for Australia; Kennecott, 1974-1979: senior vice president, technology, discusses North Carolina phosphate, Questa molybdenum; Kennecott, 1980-1993: president, discusses labor negotiations, modernization at Chino, NM, modernization of Utah Copper mine, EPA compliance, mergers with Sohio and BP, exploration activities; Salt Lake 2002 Olympic Winter Games Committee.

Introductions by C. John Sullivan, President (retired), Kennco Explorations (Canada) Ltd.; Dr. D. D. Brown, AO, Managing Director (retired), CSR Company; Ivor G. Pickering, Senior Vice President (retired) Kennecott Corporation.

Interviewed in 1993 and 1994 by Eleanor Swent for Western Mining in the Twentieth Century Oral History Series. The Regional Oral History Office, The Bancroft Library, University of California, Berkeley.



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## 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. In its eleventh year the series numbers forty-one volumes completed and others in process.

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. Langan Swent delighted in referring to himself as "technical advisor" to the series. He abetted the project from the beginning, directly with his wise counsel and store of information, and indirectly by his patience as the oral histories took more and more of his wife's time and attention. He completed the review of his own oral history transcript when he was in the hospital just before his death in 1992. As some of the original advisors have died, others have been added to help in selecting interviewees, suggesting research topics, and securing funds.

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 of AIME 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. Other individual and corporate donors are listed in the

volumes. Sponsors to date include eighteen corporations, four foundations, and one hundred and five individuals. The project is ongoing, and funds continue to be sought.

The first five interviewees were all born in 1904 or earlier. Horace Albright, mining lawyer and president of United States Potash Company, was ninety-six years old when interviewed. Although brief, this interview adds another dimension to 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. In 1990, he was inducted into the National Mining Hall of Fame, Leadville, Colorado.

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. His uncle, Frederick Worthen Bradley, who figures in the oral history, was in the first group inducted into the National Mining Hall of Fame in 1988.

Frank McQuiston, metallurgist for the Raw Materials Division of the Atomic Energy Commission and 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. After over thirty individual biographical oral histories were completed, a community oral history was undertaken, documenting the development of the McLaughlin gold mine in the Napa, Yolo, and Lake Counties of California (the historic Knoxville mercury mining district), and the resulting changes in the surrounding communities. This comprises around 120 hours of interviews with more than forty people.

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. A list of completed and in process interviews for the mining series appears in this volume.

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

Interviews were conducted by Malca Chall and Eleanor Swent.

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Western Mining in the Twentieth  
Century Series

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 Manager, Mineral Products  
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Alexander Wilson, BHP-Utah Minerals

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William Humphrey, *Mining Operations and Engineering Executive for Anaconda, Newmont, Homestake, 1950 to 1995, 1996*

William Wilder, *Owner of One Shot Mining Company: Manhattan Mercury Mine, 1965-1981, 1996*

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McKenzie, Robert  
Underwood, Della

McLaughlin Mine

Engineering constructor:  
Thiel, Klaus

Homestake Officials

Conger, Harry  
Goldstein, Dennis  
Guinivere, Rex  
Parker, Ron  
Stoehr, Richard  
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Homestake staff

Birdsey, Norman  
Crouch, David  
Koontz, Dolora  
Krauss, Raymond  
Madsen, Roger  
Onstad, Marion  
Purtell, Patrick  
Turney, John

Homestake Geologists

Anderson, James  
Gustafson, Donald  
Strapko, Joseph

Capay Valley General Plan Steering Committee

Baker, Will  
Ceteras, John

Government Officials

Bledsoe, Brice (Solano Irrigation District)  
Corley, Jay (Napa County Planning Commission)  
Cornelison, William (Lake County Superintendent of Schools)  
Drummond, John (Lake County schools attorney)  
Hickey, James (Napa County Planning Department)  
Moscowite, Harold (Napa County supervisor)  
Parker, Merrily (Cobb Mountain School teacher)  
Thompson, Twyla (Yolo County supervisor)  
Wilcox, Walter (Lake County supervisor)

## INTRODUCTION--by C. John Sullivan

It is a great pleasure for me to write this note on Frank Joklik. I have known "Jok" for fifty years and it is tribute to his fortitude and good will that I cannot recall a single unpleasantness during that time.

I first met Jok at the Australian Bureau of Mineral Resources where I was in charge of the mining division. The Bureau had been founded and was directed by Dr. Harold Raggatt who believed that then unknown mineral resources could be found by scientific means. At that time, the Australian mineral industry was in decline, with imports of minerals and metals exceeding exports by a ratio of 2.5 to 1. There was a widespread feeling that exhaustion of the earth's mineral resources was close at hand. We set out to try to help reverse this trend, and Jok, even as a student in his early twenties, was an enthusiastic supporter. We had some successes in limited areas, industry changed its outlook, and Australian mineral production is now one of the country's principal assets.

At the invitation of Jim Boyd, then Kennecott's Exploration Chief and a man of great vision, I accepted the position of president of Kennecott's exploration arm in Canada, commencing in 1954. Jok, after completing postdoctorate studies at Columbia, joined us in Canada. He found a copper deposit--not large enough for Kennecott, but good for a handsome profit to a nearby corporation.

In 1959, Jim Boyd asked me whether I had a man who could undertake an important special assignment in New York. I immediately recommended Jok for intellectual brilliance, dedication, and capacity for hard work. I had also noted his interest in the mineral industry as a whole, plus the drive which with further experience would probably enable him to assume positions of high responsibility.

This was the end of my professional association with Jok. His subsequent career has justified his early promise and his friends are proud of his accomplishments. Aside from his personal gifts, he has displayed the indispensable ability of the good manager to gather good people around him and to listen to what they have to say.

Though not associated professionally for the past twenty-five years, our personal friendship has continued. I believe it was in our house that Jok became engaged to Pamela, his beautiful wife, supporter, and outstanding contributor to the community. Apart from Jok's professional and managerial achievements, one of the more impressive aspects of the Joklik team has been its contribution to the common good.

C. John Sullivan  
President (retired)  
Kennco Explorations (Canada) Ltd.  
Consultant

Toronto, Canada  
August 1996



INTRODUCTION by Dr. D. D. Brown, AO

I have known Frank Joklik for over thirty years.

In the mid sixties we worked closely together in helping to bring the Mt. Newman Iron Ore Project into being--he as the AMAX representative on the American side and I as the CSR representative on the Australian side.

At that time I quickly formed a very high regard for Frank's professionalism and integrity. His management of the great geological effort in identifying and proving up the Mt. Whaleback ore body and his development of the feasibility studies for its mining and transport were outstanding. This, coupled with the drive and competence of Frank's then boss, AMAX Vice President, John Payne, Jr., were instrumental in building up the confidence of the Australian side to participate 50-50 with AMAX in the development of this massive project--a project which became one of the largest and most successful resource projects ever attempted in Australia.

Frank had a warmth of personality, a strength of character and a sense of humour that engendered lasting friendship and trust.

I have followed Frank's career since then with great interest and it has been no surprise that the qualities I knew in Frank in those early years in Australia have lifted him to the highest achievements in the global mining industry and also in U.S. community affairs.

Dr. D. D. Brown, AO  
Managing Director (retired)  
CSR Company

Sydney, Australia  
November, 1996

## INTRODUCTION by Ivor G. Pickering

I am pleased with this opportunity to write an introduction to the oral history of G. Frank Joklik. I hope that in reading this introduction you will become so interested in Frank, the man, that you will read the complete history.

When, in February 1980, Frank was appointed President, Kennecott, I was confident that he was the right man for the job, and subsequent events, to my mind, have given ample proof of it. Frank appointed me Senior Vice President, Operations, in 1980. Kennecott was in considerable difficulty in that its production facilities at the several mining areas were antiquated, union contracts in force included clauses that restricted badly needed improvements in work practices, and production costs were high. It was no secret that great changes would have to be made throughout Kennecott if it were to continue as a viable and profitable business. Frank's hands-on operations experience was not extensive, although he had been involved with large projects in which operations capabilities were an essential part. His knowledge and experience with the business of mining and metals production were great assets as the fight began to cut costs drastically at the Kennecott properties, at first without capital investment. Frank moved with dispatch to mount that attack which went into every aspect of each mining area's operations and that lasted over at least a four-year period and achieved major cuts in production costs.

I enjoyed the rough-and-tumble of the battles to cut costs and to improve operations at the mining properties. I appreciated Frank's tenacity and determination to do what was needed in the face of great odds in getting the necessary changes made.

The major efforts at change were not far along when Kennecott was sold to Standard Oil of Ohio, and that change brought all kinds of new dimensions to Kennecott. Getting a major oil company to understand and appreciate the very large, major copper company that was Kennecott and to get from that new owner the necessary support and funds to make major changes at Kennecott were severe challenges that landed in Frank's lap. Those were difficult times, but Frank was equal to those challenges.

I want you to know, too, that although there was hard and continuing work at Kennecott, Frank was not an unfeeling machine. To the contrary, he tried hard to encourage all who worked there and to establish a sensitive team that would work well and smoothly together. It was not uncommon for Frank to stop in the morning's work and have a cup of hot soup from the canteen that was in a room nearby, and it was common for one or more of us to join him in that more informal setting. There the discussions often ranged far from the day-to-day problems at Kennecott and they were warm personal meetings that were appreciated.

I retired in June 1982 and served only briefly after that on as-needed basis in consulting on some operational problems. As I look back now at those days, I'm sure that Frank was "the man for all reasons" at the Kennecott of those days. He was a tough-minded, determined leader who expected and demanded performance from himself and from all of us in the efforts to make Kennecott a high-productivity, low-cost copper producer, fully competitive on the world's stage. I gained a great deal in working with him and in helping him find ways to get the job done.

It is difficult to put down in writing specific facets of the complex and capable person that is G. Frank Joklik today, but it should be noted that in addition to his quickness in learning new things, his ready grasp of the essentials of major industrial work, and his determination to overcome obstacles, Frank came across well in the social aspects of life. He and his lovely wife, Pam, were and are the great host and hostess combination, gracious and warm in their many engagements.

I have followed Frank's general progress in the years from 1982 when I retired to Frank's retirement in 1993. In my view, in those years his accomplishments in modernizing Kennecott were outstanding. In 1987, British Petroleum Co. took over Standard Oil of Ohio and Kennecott, and Frank was again in the middle of change which he handled with his usual aplomb.

In the past few years he has been a leading person in the drive that culminated in getting the International Olympic Committee to name Salt Lake City as the site of the 2002 Winter Olympic Games. He has not moved away from the mining business entirely, being engaged with exploration and work at yet another mining company.

As I see Frank today, he has gained in stature in every business and activity in which he has been engaged and has made each of them better. His knowledge and experiences span many and distant parts of the world. He is known and appreciated by prominent leaders both here and abroad. In my mind, as I have told him recently, I consider him a World Citizen in the most complimentary way.

Ivor G. Pickering  
Senior Vice President (retired)  
Kennecott Corporation

St. George, Utah  
August, 1996

## INTERVIEW HISTORY

G. Frank Joklik was among the first to be recommended for inclusion in the series on Western Mining in the Twentieth Century, when the initial list of possible interviewees was compiled in 1986. He was identified then as a brilliant young executive who would have an important story to tell in a few years when he had completed the modernization he was spearheading at Kennecott's Bingham Canyon mine.

Kennecott Copper Company was an early corporate sponsor of the mining oral history series. One of the first five distinguished men interviewed for the series was James Boyd, a former vice president and head of exploration at Kennecott, dean of Colorado School of Mines, and head of the U.S. Bureau of Mines, an Australian and mentor to Frank Joklik. When I interviewed Jim Boyd in Carmel in 1986, he was greatly excited by the changes at Kennecott. We invited Frank Joklik to write an introduction for the Boyd oral history, and one of the photos selected for the Boyd volume was taken on the rim of the Bingham Canyon pit when the Boyds were houseguests of the Jokliks in the summer of 1987.

In the intervening years, Frank Joklik and I kept in touch by correspondence and occasional sightings at meetings, until his retirement from Kennecott allowed him the time to work on his own oral history. "Retirement" is a purely technical term, and does not mean a leisurely life, for as soon as he left Kennecott, Frank took on the chairmanship of the committee which succeeded in getting the Olympic games to come to Salt Lake City in 2002. At present he is still working hard on that and other civic boards as well as serving as president of MK Gold, but his retirement did allow time to work on his oral history.

It was convenient to hold the interviews in Salt Lake City at his beautiful offices in the Eagle Gate Tower, with sweeping views of the valley and nearby Wasatch Mountains. Office decor includes the bronze Rodin statue awarded to the Copper Man of the Year.

A planning session was held on July 15, 1993. The invitation letter was sent on July 19, 1993, and the first interview session was held on October 18, 1993. During subsequent days, I was allowed to use an office for viewing videos of Kennecott and studying relevant documents. David B. Morris, Kennecott Corporation's manager for market research, was generous with his assistance, providing materials and also an informational interview. His comprehensive document Digging Out: Kennecott Resurfaces in an Era of Global Competition (Kennecott Corporation, 1993), is now part of The Bancroft Library's mining collection. I spoke at length by telephone with Ivor Pickering, retired senior vice president of Kennecott.



Of special help for my understanding of the Kennecott situation, and particularly enjoyable, was a tour of the mine and processing plants personally conducted by Frank Joklik. The tour began at the visitors center with a fine video presentation, dramatically concluding with the opening of drapes on the theater's window wall to reveal a breathtaking view of the Bingham pit. From there we drove into the pit to view the mine operation and appreciate the significance of the recent change from rail to truck equipment for moving ore. After a drive through Copperton with its brick houses dating from a much earlier period, we toured the state-of-the-art Copperton Concentrator. We looked at the tailings pond and envisioned changes to be made there in the future. Finally we passed the rail line which links this enterprise to the larger world.

On return visits, January 19-22, 1994 and February 22 and 23, 1994, six further interviews were held. In all, a total of twenty-eight hours of interviewing was necessary in order to do some justice to the extraordinary breadth of the Joklik career.

Both Pam and Frank Joklik are actively involved in the cultural life of Salt Lake City, so I had the pleasure of being their guest at the Sundance Film Festival screening of a film which later won several Oscar nominations, and also at a performance of Verdi's opera "Macbeth".

When the interview process was complete, the tapes were copied and sent to Salt Lake City to be transcribed in the Joklik office by Lynn Thomason, Lynn Barnett, Joanie Bingham, Christina Lopez, and Wendy Van Ry. Mr. Joklik did his own editing, adding relevant information as necessary. He inserted headings, completed the table of contents, and placed and identified the photos and illustrations, tasks which are generally thankless and therefore usually left to the editor. I am heartily grateful to him for the many hours of work which he put in to make this fine volume. The supplementary documents will be of special interest to future researchers. The interviews were indexed at our office. We learned the advantages as well as some of the pitfalls of sending computer disks back and forth, and sincere thanks are due to Wendy Van Ry for her expert work in this area.

Three friends and associates wrote introductions: Dr. D. D. Brown, Managing Director (retired), CSR Company; Ivor G. Pickering, Senior Vice President (retired), Kennecott Corporation; and C. John Sullivan, President (retired), Kennco Explorations (Canada) Ltd.

Kennecott Corporation generously contributed to the funding of the oral history.

The Regional Oral History Office was established in 1954 to record the lives of persons who have contributed significantly to the history of California and the West. The office is a division of The Bancroft Library and is under the direction of Willa K. Baum. A listing of other oral



history interviews in the Western Mining in the Twentieth Century series is included in this volume. The tapes of the interviews, along with supplementary materials donated by Mr. Joklik, are deposited and available for study at The Bancroft Library, University of California at Berkeley.

Eleanor Swent, Project Director, Western  
Mining in the Twentieth Century series

January 24, 1997  
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G. Frank Joklik addressing union leaders at 1981 meeting

G. Frank Joklik, Kennecott President, at commencement of 1986 labor negotiations

G. Frank Joklik planning Utah Copper modernization with Bob Dimock and Raman Rao, 1984

Utah Copper modernization opening, 1988

Fourth line at Copperton Concentrator, 1992

Artist's drawing of new Utah Copper Smelter, 1991

President George H. W. Bush supports Kennecott's resistance to Superfund listing, 1992

Senator Orrin Hatch tells one on Senator Jake Garn, to the Jokliks' amusement, 1992

Rod Davey and G. Frank Joklik in front of new Bingham Canyon Mine primary crusher control room, 1990

Gavin Thomas and G. Frank Joklik at hot springs adjacent to Lienetz orebody, Lihir Island, 1983

Lihir Island, with artist's drawing of gold mining operation superimposed, 1993

Katie Joklik's twenty-first birthday, 1987

G. Frank Joklik, director of First Security Corporation, 1984

"People of Vision" dinner, Salt Lake City, 1992

G. Frank Joklik running gates at Snowbird, 1987

Lillehammer Winter Olympics, 1994

Entertaining IOC Site Selection Commission at home, 1994

G. Frank Joklik briefing Vice President Al Gore, 1994

Rainbow Bridge, Lake Powell, 1995

World Cup Opening, Park City, 1995

Dinner at home, 1995, presenting to Valeriy Borzov a book with photo of his  
1972 Olympic Gold medal win in 100-meter final

Salt Lake Bid Committee Chairman G. Frank Joklik addressing IOC Plenary  
Session, Budapest, June 16, 1995

G. Frank Joklik receiving telephone congratulations from President Bill  
Clinton, Budapest, June 16, 1995

Greeting the crowd at Salt Lake City and County Building on June 17, 1995

IOC President Juan Antonio Samaranch with G. Frank Joklik, Salt Lake  
Organizing Committee Chairman, at IOC Executive Board meeting, Lausanne,  
1996

Kyrgyz Republic Mining Company President Dastan Sarygulov presents  
painting of Lake Issyk-kul to MK Gold President G. Frank Joklik, in  
presence of Leucadia Chairman Ian Cumming, 1995

Randy Dryer, Chairman, Utah Sports Authority; G. Frank Joklik; Tom Welch,  
President, Salt Lake Olympic Committee, after sliding bobsled track at  
Utah Winter Sports Park on Opening Day, January, 1997.

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Berkeley, California 94720

BIOGRAPHICAL INFORMATION

(Please write clearly. Use black ink.)

Your full name GUNTHER FRANZ JOKLIK

Date of birth May 30, 1928 Birthplace Vienna, Austria

Father's full name Karl Friedrich Joklik

Occupation Electrical Engineer Birthplace Pressburg, Austria

Mother's full name Helene Louise Adele Giessl

Occupation Teacher Birthplace Mahrisch Trubau, Austria

Your spouse Pamela Mary (Fenton) Joklik

Occupation Community Volunteer Birthplace Edinburgh, Scotland

Your children Katherine Pamela; Carl Duncan; Paul Richard

Where did you grow up? Australia

Present community Salt Lake City, Utah

Education B.Sc, University of Sydney (First Class Honors)

Ph.D. University of Sydney; Fulbright Scholar, Columbia

Occupation(s) Geologist; Exploration Geologist; Mining Corporation  
Vice President, President, Chief Executive Officer

Areas of expertise Geology, Mining Exploration; Corporate Management

Other interests or activities Bringing 2002 Olympics to Salt Lake City;  
on Boards of First Security Corporation, U. S. Borax Inc., &  
Cleveland-Cliffs Inc.

Organizations in which you are active National Academy of Engineering;  
National Research Council; National Mining Hall of Fame & Museum;  
Utah Opera



## I FAMILY AND EARLY SCHOOLING, 1928-1944

[Interview 1: October 18, 1993] ##<sup>1</sup>

Swent: This is Eleanor Swent interviewing [Günther Franz] Frank Joklik on October 18, 1993. Here we are in Salt Lake City, Utah, on a beautiful October day, but we have to go back to your beginnings which were in 1928 in Vienna. Do you want to start the story there?

Joklik: Yes. Here in Salt Lake I've tended to be identified with Kennecott and the 2002 Olympic Winter Games. But the trail goes back and begins in Vienna on May 30, 1928. The first decade of my life was in Vienna and I have nothing but pleasant recollections of those years. My parents, of whom I was very fond, spent most of their lives in Vienna. I should talk a little about who they were and where they came from.

### Father, Karl Friedrich Joklik, Navy Officer and Engineer

Swent: What was your father's name?

Joklik: His name was Karl Friedrich Joklik. At the time of my birth he was employed in Vienna by a division of Siemens as an electrical engineer.

Swent: Siemens is not an Austrian company, is it?

Joklik: No. It's a German company which had an Austrian affiliate called Siemens-Schuckert. My father was born in a town about sixty kilometers from Vienna called Pressburg, now better known as Bratislava, capital of the recently formed Slovak Republic.

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<sup>1</sup>## This symbol indicates that a tape or tape segment has begun or ended. A guide to the tapes follows the transcript.

Swent: That's only sixty kilometers from Vienna?

Joklik: That's about all, yes.

Swent: I didn't realize that.

Joklik: He was brought up in a naval academy and his father, my grandfather, was an army officer. You may recall that Vienna, at the time my father was born, was the capital of the Austro-Hungarian empire which had an extensive shoreline on the Mediterranean Sea. Hence, there really was an Austrian navy. He was brought up fairly strictly until he graduated, not long before the First World War.

He was born in 1893, so at the outbreak of the war he was twenty-one. As a junior naval officer, he served on a light cruiser named the "Helgoland." Later, he commanded a submarine. After the war, the Austrian navy ceased to exist because Austria became a land-locked nation. He decided to go back to school and enrolled at the Technical University in Vienna. He graduated in electrical engineering. Upon his graduation he joined Siemens.

#### Mother, Helene Giessl, School Teacher

Joklik: My mother was born in a relatively small town called Mährisch Trübau. This now has one of those difficult Czech names, Moraska Trbova. Her maiden name, Giessl, was that of a German speaking family of land owners which had lived in that area for hundreds of years. But her father did not follow the farming tradition. He pursued an academic career and became headmaster of the local high school. That was his position when my mother was born in Mährisch Trübau in 1896.

Swent: And what was her name?

Joklik: Helene. My mother's full name was Helene Louise Adele Giessl. She went to high school in Brünn, which is now called Brno and is the second-largest city in the current Czech republic. Then she went on to Vienna to attend the teachers' academy. That's where she met my father when he embarked on his engineering career. They were married in Vienna on July 11, 1925, in the Stefansdom, or St. Stephen's Cathedral.

My parents were a striking couple. Both were tall; my father fair, blue-eyed and handsome, and my mother dark-haired and beautiful. They were principled. Their word could be relied on. My father's military background provided him with a disciplined approach to life, yet the ability to appreciate and be the life of a good party. My mother was highly cultured in the arts and music. She was spirited and certainly had a mind of her own. Both were loving, and let us know they were proud of us.

To go on, then, in 1937 my father left Siemens to join an Austrian steel company, the English translation of which would be Styrian Steel Works; in German: Steyrische Guss-Stahl Werke. He then entered into a contract with the company to go to Australia and establish sales offices in Sydney and Melbourne.

Brother, Wolfgang Karl Joklik, Duke University Professor

Swent: Let me just quickly--you said that you have a brother.

Joklik: Yes. My brother is a year and a half older than me.

Swent: I see. So he was also born in Vienna.

Joklik: Exactly. He and I were and are close.

Swent: Would you like to give his name?

Joklik: Yes. His first name is Wolfgang, just like Mozart. Wolfgang Karl. He is a renowned person. He recently retired from the position of chairman of the Microbiology Department at Duke University. He has received many high academic honors, including membership in the National Academy of Science. He is one of the two or three leading virologists in this country. At his retirement dinner there were several Nobel Prize winners who came from various parts of the world to honor him.

Swent: Quite a distinguished family.

Joklik: Well, thank you. Both of my parents were bright, and my brother is, too. I think I'm the black sheep of the family.

Swent: Oh, I don't think so. [chuckling]

Childhood in Vienna

Joklik: Anyway, at the time of my birth my parents lived right in the city of Vienna, in a large apartment which I remember fondly. There was a live-in maid with whom my brother and I had a--put it this way, a relationship of respect when respect was due. Anyway, it worked.

We went to a public primary school. Teaching was of a high standard, and discipline was strict. There was strong emphasis on academic performance and no one, neither the students nor the parents, questioned that. My brother was a year ahead of me. We both were generally at the top of our respective classes.

Swent: I would guess you didn't have much choice in that.

Joklik: In what?

Swent: Your parents probably expected you to be at the top, didn't they?

Joklik: Well, but there was choice. Sure, academic performance was expected, but not only of us. It was expected of all of us in school. It was not considered a negative to perform well academically. This doesn't mean that the kids were always at their books, or that they were terribly serious. I think I was in a class of twenty-five. Many were my close friends. We used to play sports, particularly soccer and gymnastics.

Swent: It was a boys' school?

Joklik: Oh, yes! [laughter]

Swent: That's all we need to say about that.

Joklik: I don't think there were any co-ed schools in those days.

Swent: Was it a basic classical curriculum?

Joklik: Yes. When we left for Australia, I had completed four years of school. No languages at that stage, but our parents gave us private lessons in English from the second or third grade.

Swent: Was this a common thing?

Joklik: I know that some of my friends also had English instruction. Our parents recognized that English was an important language, world-

wide; and so we had English lessons, even before my father's appointment to the Styrian Steel Company.

Swent: Did he also know English?

Joklik: Some. But he wasn't fluent.

Swent: And your mother?

Joklik: She spoke very good French and some English. Anyway, the environment in Vienna, as I recall it, was one of security, direction and parental care.

Swent: I thought music. One immediately thinks of music in Vienna.

Joklik: I started piano lessons at age seven or eight. Now, I quickly found that I didn't have much talent. Lessons continued until the age of revolt, at thirteen or fourteen years old, when I could plead pressure of other activities. I think my brother did better than I did. I love music, but manual dexterity on the keyboard wasn't my attribute.

As I think I've already said, we attended a boys' school--boys in the classroom, and almost all boys in extra-curricular activities. My knowledge of the world of girls was a closed book to me until--well, for quite some time--because in Australia we also went to a boys' school.

Swent: What kind of clothes did you wear to school?

Joklik: There wasn't a school uniform, but--I'm trying to think. I was still in short pants, of course, and a shirt and jacket or sweater.

Swent: A tie, I suppose?

Joklik: Ties? In the wintertime. I don't think in the summertime.

Swent: Cap?

Joklik: No. Oh, in the winter, when it got cold.

Memories of those days include the supportive environment in the school where one's form master, although strict, insured that students didn't fall through a safety net. One evening, I was asked to recite a poem. My brother had developed flu and, even though he was a year ahead of me, I was asked by his form master



whether I would substitute for him. I said yes and learned the poem, but getting up on the stage in front of an audience of maybe a hundred or two hundred fond parents was something I wasn't comfortable with. Fortunately, I didn't have a memory lapse. Afterwards my parents asked me why I started grinning halfway through. The reason was that this form master of my brother's was sitting in the front row with a broad grin on his face, directing my recitation with his hands, as if he were conducting a choir.

In the evenings we'd do our homework. In the drawing room, to which my parents retired after dinner, my mother would play. She was an excellent pianist. And my father would be reading. There was always a box of chocolates on the drawing room table. Occasionally, my brother and I would be invited to partake. But going to sleep by the sound of my mother playing the piano is something I haven't forgotten.

Swent: It sounds like a delightful memory.

Joklik: Yes. On weekends, apart from organized school activities, we'd go on excursions. We'd go a little distance outside the city by car or train, and then hike on well-marked trails through the forests and meadows. I'm amazed at the distances we, as little kids, used to cover with our parents. Sometimes we'd carry a pack sack, stay overnight at an inn and then return to the train station or wherever we'd started from.

Swent: How far were you walking? Ten miles?

Joklik: Well, eighteen kilometers would not be unusual in a day.

Swent: That's a lot for little boys.

Joklik: Yes. It wasn't necessarily always done with the greatest enthusiasm [laughter], but it taught us to develop a little stamina and appreciate the beauties of Mother Nature.

We should also talk about summer vacations. They were usually taken in the mountains or by some lake. We would go for, say, six weeks and my father would come for a couple of weeks, and then on weekends, from Vienna. Towards the end of summer, we'd go to Mährisch Trübau and spend time on the Giessl family farm. At that time, it was owned by my mother's aunt Emilie and run by her husband, a retired army colonel whom we called Uncle Hans. He was a bear of a man, a wonderful person with a great sense of humor.

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My brother and I would help with plowing or loading hay; or just go in the forest and gather mushrooms. Every summer we would spend a couple of weeks there.

Swent: It sounds delightful.

### Mährisch Trübau Re-visited

Joklik: Let me leap ahead half a century to relate that in the fall of 1993, Pam and I happened to be in Europe in connection with Salt Lake City's bid for the 2002 Olympic Winter Games. After the meetings, we spent a few days in Prague. On the spur of the moment, we rented a car and drove the 200-odd kilometers east from Prague to visit Mährisch Trübau.

Swent: Had you been back in the meantime?

Joklik: No. It was behind the Iron Curtain. Frankly, I thought the town hadn't changed that much. Before the war, one-third of the population of Czechoslovakia was German speaking. They all were expelled after the war, three and a half million of them, my great uncle and aunt included. They died shortly afterwards. I did find the old family cemetery, but the old headstones had been plowed over to make place for new graves. It's still a beautiful site, with a 17th century church within the cemetery grounds; but the church had been closed up for decades and was in a sad state of neglect.

Swent: Were the houses there that you had been in?

Joklik: Yes, in the town of Mährisch Trübau, but not where the farm used to be. During collectivization of farms under the Communists, essentially all farmhouses and most churches were destroyed. Farmers now live in three- and four-story concrete buildings the Communists were fond of erecting.

Swent: It must have been a wonderful visit.

Joklik: Pam has a great sense of direction, which came in handy because there are no road signs in English or German. We didn't know one word of Czech.

Swent: You didn't find any relatives.

Joklik: No. As I said, all German-speaking people were expelled after World War II. But in the cemetery there was an elderly Czech gentleman. I communicated with him through sign language. By then, it was close to six o'clock, and I knew it would get dark in another hour. As I was leaving the cemetery, the old man stopped me and pulled car keys from his pocket. He motioned towards a little car parked just outside the cemetery gate. As near as I could gather, he wanted to tell me, "Look, let's go to the registry office and check whether we can find a record of your relatives." I thanked him very much and wished we'd had the time to go, but we had to start driving back to Prague.

Swent: You mentioned the church. Were your family Roman Catholic?

Joklik: Yes. Austria was and is predominantly Catholic.

Swent: So then your father left Siemens and went with this Styrian company.

Joklik: With Styrian Steel Works, yes, Steyrische Guss-Stahl Werke, to open offices in Australia.

Swent: Oh, he opened offices there.

### Journey to Australia

Joklik: Yes. He signed a contract on the 2nd of December, 1937. The events leading up to our departure included many parties with our relatives, of course all on the assumption that we'd be back in three years. But we were going right around the world. There weren't any commercial airlines in those days, which meant a long sea voyage. We said our fond farewells, which I still remember clearly. The packers had come several days before. What we took with us on the ship consisted of two of those big--

Swent: Steamer trunks? [quietly]

Joklik: Steamer trunks. You opened them up and could live out of them. Two of those and countless suitcases. Eight large crates were shipped separately, including the baby grand piano.

Swent: Did you have any pets? Were there animals?

Joklik: No. Fortunately, because Australia had some of the toughest quarantine laws in the world. Quarantine periods were six months and longer.

On the 6th of January, 1938, we took the train from the South Railway Station, the Süd Bahnhof, in Vienna. The route was Venice, Rome, and Naples, where my brother and I had our first sight of the sea. That was a thrill in itself. One of my--

Swent: You didn't see it at Venice?

Joklik: No. It was night-time. Well, that's not quite true. We were awake and saw a reflection of moonlight on the water, but it wasn't 'til the following day that we saw the open sea.

Swent: Really saw it.

Joklik: We checked into the hotel in Naples and spent a day visiting Pompeii. I could swear Vesuvius was emitting smoke at that time. And then on the 9th of January, 3:00 p.m., the P&O Liner--have you heard of the P&O Line?

Swent: Certainly have.

Joklik: Yes. The P&O Liner, "Orion".

Swent: That's where the term "posh" came from, I think.

Joklik: I don't know. Really?

Swent: I think so. P&O, I've forgotten what the "sh" stands for, but--

Joklik: P&O stood for Peninsular & Oriental Steam Navigation Company.

Swent: But, if you went out in a certain accommodation it was called p-o-s-h I think:

"Port Outbound Starboard Home"!

Joklik: We cast off at 3:00 o'clock that day and within an hour, my mother, my brother and I were seasick!

Swent: Oh-oh! [mutual laughter] You don't remember it with too much pleasure, obviously.

Joklik: Look, everybody gets seasick when they first get on a boat. I think in twenty-four hours my nausea was over.

Swent: Oh, it didn't last the whole trip, then.

Joklik: Just a matter of finding your sea legs. The weather was pretty bad when we set sail. It lasted for a day or so and then cleared up.

Swent: You went through the Suez Canal?

Joklik: Yes. Port Said was the first stop. At each stop there was a tour of the city. Those were the days when a passenger liner berthing was a relatively big occasion for the local people.

Swent: It must have been terribly exciting for a little boy.

Joklik: It was. Next stop was Aden, then Colombo.

Swent: A lot of water between Aden and Colombo.

Joklik: Yes. Six days' travel.

Swent: Pleasant weather at that time of year.

Joklik: It was. Although, when you get close to the Equator it doesn't matter what time of the year it is. In Colombo, I remember a guide walking up to a tree, cutting a notch in it, and letting the sap ooze out. Before you knew it, he had a big rubber band in his hand.

After Colombo, the next stop was Fremantle, after a week's straight sailing. Life on board was pleasant. They had a children's playroom where we spent much of the day. There were organized games and swimming and fancy dress parties. We'd go there whilst our parents were up on deck for dinner and dancing.

Swent: I've forgotten. Fremantle has just one "e", Fre--

Joklik: F-r-e-m-a-n-t-l-e, the port for the city of Perth. One of my first comments about Perth was that it didn't differ much from a European city. We didn't know what to expect in Australia. We'd read books, of course. In retrospect, Australia was easy to get adjusted to.

In Adelaide and Melbourne we didn't go on shore. There were measles epidemics in both places, so no kids were allowed off the ship.



Then Burnie, which is on the north shore of Tasmania. It's still a sleepy town today. We berthed early; dawn was just breaking, and I saw stevedores handling bales of wool with their hooks. They were dressed in long pants, grey singlets and broad-brimmed hats that I first thought were cowboy hats. That was my first impression of "Aussies" at work.

Swent: I've been to Perth and Adelaide and Melbourne, but I've never been to Tasmania at all.

Joklik: A very beautiful island. But cold and windy in the winter. The "roaring forties" come through there.

Swent: I've a feeling that's quite a voyage from Perth around through there, isn't it?

Joklik: Yes. From Burnie we sailed back towards the mainland, across the Bass Strait, where all the oil has been found. And then north to Sydney.

Swent: And by now you're at the end of January.

Joklik: Yes. In fact, into February by now. In Sydney and Melbourne a normal summer might have two or three hot spells of a few days. A record heat wave occurred in January, 1939, when the thermometer hit 107 degrees F and the mid-day sun was obscured by the smoke from bush fires ringing the city. But normally, the summer weather isn't oppressive.

#### Cranbrook School, Sydney

Joklik: We arrived in Sydney on the 10th of February, 1938. We booked in at the Wentworth Hotel, which was the best at that time. I remarked on my first impression of Sydney--funny for one who'd never been to America--I said it was totally Americanized. [mutual laughter] And I referred to the city as "a mass of skyscrapers." The tallest building was the Shell Oil building which must have been eleven or twelve stories high. I'd never seen a building that tall, but to me that was a skyscraper. Then there was the AWA building. It had a radio tower which was the highest feature of the city. Those buildings are dwarfed by the skyline of Sydney today.

The next day we started to look at schools. We first visited Scots College which made a so-so impression on us. We went on to Cranbrook which we immediately liked. Our schooling at Cranbrook became a big part of our formative years. First we had to order school uniforms which were grey suits, blue shirts, grey knee-length socks--we both still wore shorts at that time--black shoes and either school hats, boaters or visor caps.

We started at Cranbrook barely after the beginning of the school year; let's see, the 10th of February is usually the beginning of the school year. The kids stared at us as we went to school, because to their eyes we were dressed a bit funny. It took a couple of days to get our school uniforms together. And our knowledge of English still left much to be desired. We had learned a lot on the ship. What was it, five weeks or six weeks on the ship? We embarked--

Swent: January 6th to February 10th? Five whole weeks. At that age you can learn a lot of language in that time.

Joklik: Oh, sure. Especially, since we made some good friends on the ship. Apart from the kids, I remember a Mr. Talbot Wilson from the Jersey Islands. He took a shine to our family. We corresponded with him afterwards. He wrote down our birthdays and used to send us birthday presents. He was an optimist. As late as a month before the war, he wrote to us that he was convinced there would be no war, simply because he believed the people would not follow the "politicians."

After only a few weeks, we were already beginning to feel at home at school. Cranbrook was and still is a boys' college, a member of what was called the Associated Schools in Sydney. The term "college" is here used in the English sense of a private high school. There was intense rivalry between the Associated Schools and another group of private schools, ironically called the Great Public Schools.

Cranbrook was founded in 1918 and is in the beautiful grounds and buildings of the former residence of the governor-general of New South Wales. It's a Church of England school, which didn't really affect my brother and me, or the other few kids who were Catholic. We attended religion classes given by the school chaplain. Services were not frequent and we were free to attend or not. We took catechism classes from a priest at a nearby Catholic school to prepare for confirmation. That involved an oral examination, administered by the Archbishop, later, Cardinal Gilroy. He asked me to recite the Apostles' Creed which

I hadn't learned in English. So I rattled it off in German. When I finished, he smiled benignly and said, "I didn't understand a word you said, but your fluency convinces me that you know it just fine."

#### Lieutenant General Sir Ivan Mackay, Headmaster

Joklik: When my brother and I started at Cranbrook, in 1938, the student body numbered about 400. The headmaster was General Ivan Mackay who later, in the Second World War, became Lieutenant General Sir Iven Mackay, so-called "Hero of Tobruk;" an outstanding military man, a scholar and a gentleman. He took a shine to my parents and, I think, a little to us boys. We felt comfortable with him, though he had an imposing presence.

#### A Golden Period ##

Joklik: My father opened his offices in Sydney and Melbourne. I remember the afternoon my brother and I were walking past the school oval down to the playing fields, and a car pulled in behind us. We looked around and it was my father in a brand new Chevrolet. I don't think I'd ever really taken a good look at an American car before. That's mostly what there was in Australia at that time. There weren't any cars made in Australia; there were a number of small imported English cars: Morris, Vauxhall, and so on, but the vast majority were Chevrolets and Dodges and Buicks and Oldsmobiles; you know, the standard GM, Ford, and Chrysler products as well as some that don't exist any more, like Packards, DeSotos, and Studebakers.

Before I change the subject, I should say that when my father bought the Chevrolet, my mother hadn't done any driving. She started taking lessons, which my brother and I became aware of, but my father didn't know. Then one evening, before dinner, she slipped her brand new driving license under his plate. He was flabbergasted. We celebrated and my father admitted he'd noticed that my mother's shoes had become inexplicably buckled, presumably by my mother's, at times, frantic recourse to the brake pedal.

Swent: Now, was your father overseeing manufacturing?

Joklik: No, sales. His company made specialty alloy steels. I wasn't too familiar with the technology, but they must have been tungsten, molybdenum, nickel and chromium alloys. Austria was at the cutting edge of this technology. It was a matter of testing the market here and there and establishing a distribution network.

We looked around for a house to rent and found one in a pleasant suburb. There were palm trees in the garden. We'd never seen palm trees close up, except on the journey out. The idea of having to water the lawn every day and then cut it, once or twice a week, was also new and exciting to us.

Our first acquaintance with the Australian bush was seeing these strange trees which are not deciduous--the eucalyptus trees and the fauna that inhabited them. There were parrots and budgerigars. Near the city you didn't see kangaroos, but there were parks near Sydney where kangaroos were kept. We used to go out and feed them and the koala bears.

On some of our trips we'd see snakes. We were well aware of Australia's many species of snakes, most of them venomous. Occasionally we'd run over one with the car, and stop to take a close look which wasn't, perhaps, the smartest thing to do.

Our fellow students were bright and pleasant. I won't say we didn't get into fights, but by and large we quickly formed friendships and began to spend time with them outside of school hours. Of course, in those days there wasn't any television. Either we'd kick a football around or we'd go down to the beach and rocks around Sydney Harbor, collecting shells and oysters.

Swent: I've seen it; been there. Beautiful.

Joklik: I think it's the most beautiful harbor in the world.

Swent: I think it's generally called that.

Joklik: Vaucluse is the suburb I grew up in. We were only a hundred yards or so from the water. Of course, you couldn't just jump in and swim because of sharks. A summer didn't pass without one or two or three people getting taken by sharks.

Swimming in the harbor was done from beaches that had shark nets around them. If you wanted to swim, you went in the harbor; if you wanted to surf, you went to the ocean beaches. When I was older, I'd dive and look at the holes in the shark nets. They



were yards across, and any sharks that wanted to could come in and help themselves. [mutual laughter]

Swent: You didn't know that as a boy, though.

Joklik: No, we didn't know that.

Swent: Oh, my. It sounds like a wonderful childhood, though. Really.

Joklik: In the wintertime, it used to get dark around five-thirty or six o'clock. On a sports day, as they mostly were, we didn't get home much before dark, and then came dinner and homework. In the summer you'd swim practically every day, starting from late October until early April.

Meanwhile, learning progressed rapidly; I don't mean just academically. Impressions of many kinds engulfed us. People were kind, not only the kids at school. My parents developed friendships with other parents who came to the house for dinner, and we'd visit them.

Whenever there was a birthday at school, the boy concerned would give a party. There were several kinds of parties. One was to meet at one of the wharves close by, get on a chartered boat--an average of forty or sixty kids--and go out to one of the islands in the harbor. There would always be huge quantities of ice cream, packed in dry ice. And tons of food. You'd hell around all day. The party on the island was often combined with a movie that night.

Swent: Who were the adults in attendance?

Joklik: The parents of the kid giving the party.

Swent: This was on a weekend, so it wasn't a school day?

Joklik: On weekends. Right. There were beautiful parks in Vaucluse. We would meet there for parties. Sometimes they'd have horses. Many of the kids at school, especially the boarders could ride bareback at age ten or eleven.

Swent: They probably came from the Outback where riding was common.

Joklik: Yes. They came from families that had sheep or cattle stations.

Swent: So you were in, what, the equivalent of the fifth grade?



Joklik: I'd had four years of school in Vienna. I went into fifth form at Cranbrook, but within a year both my brother and I had skipped two grades. That was the good news. Of course, when I eventually graduated from Cranbrook and went to the university, I was only sixteen. I was always amongst the youngest, which taught me self-defense.

Swent: So Cranbrook went all the way through high school, then; secondary school.

Joklik: Yes, but I should back track a little. From early 1938 through September '39 was a sort of golden period. At the same time, we were aware of the clouds of war gathering. My father was the eternal optimist, convinced there would not be a war. His standard speech was, "Believe you me, I've been through a war, and no one in their right senses would go through another one."

Many of our friends in Sydney were the same way. We had a family doctor, Dr. Hobbs. I remember going to his clinic one evening with my father. We sat there chatting. Dr. Hobbs had also been in the First World War and he, like my father, said, it's just impossible there could be another war, because people wouldn't want to endure the suffering.

My brother and I were concerned because there was talk at school about war. My mother, who was more of a realist than my father, worried.

Swent: What was your citizenship?

Joklik: Austrian. Then came the occupation of Austria by Germany, in November 1938--

Swent: November, '38. Okay. Is that what they call the Anschluss?

Joklik: Yes. It set the stage for what was to come. The Germans annexed Sudetenland, which was the German-speaking part of Czechoslovakia; and then they occupied the rest of Czechoslovakia.

Swent: And you were aware of this. In school as well as at home?

Joklik: It was all over the papers.

Swent: How did the papers get their news?

Joklik: Transoceanic cable. Cables were laid before the First World War.

Swent: No thought of Japan at that point, was there?

Joklik: No. Without TV, you actually read newspapers and books. When you had visitors to the house, you talked. You didn't sit together and watch TV.

Swent: Very different era, wasn't it?

Joklik: Yes.

Swent: Did your mother have household help in Australia?

Joklik: Yes. But not live-in like we had in Vienna. She had a woman come twice a week, as I remember.

Swent: It must have been a tremendous adjustment for her. An entirely different kind of life.

Joklik: Yes. I'll have more to say about her.

Let me make a couple of more comments about the ambience of Sydney in those days. Public transportation by way of trams and buses was good because not all that many people had cars. My father used to drop us at school in the mornings, but we'd take the tram or a bus home. Home deliveries were standard. The baker, the grocer, the greengrocer, the milkman--all of these, as a matter of course, made deliveries to the house. There weren't any washers or dryers.

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Joklik: Laundry day coincided with visits by the cleaning lady, and my mother and she would go at it.

Other characteristics of the time: dentists, for example. This was before the days of fluoride. Cavities were filled without numbing. All a dentist said was, "Open wide, please".

Swent: Those were not such good days.

Joklik: [chuckling] No. But, you were used to it.

There seemed to be a lot more in the way of flu, measles and childhood diseases. We went through them all. I forget what inoculations were for, but they weren't effective against a wide range of illnesses.

Swent: Smallpox is about the only one, wasn't it?

Joklik: Smallpox, yes, everybody had those marks on their arms.

Swent: That was about it, I think.

Joklik: I remember I had adenoids removed before we left Vienna. I had a general anesthetic, but hated the smell of ether. And then I had my tonsils out in Sydney.

Swent: So the tonsils and adenoids were done separately.

Joklik: Adenoids were done first. But then I got a run of colds and the family doctor said to have my tonsils out. It seemed that everybody had their tonsils out.

#### Outbreak of War

Joklik: This leads us up to the outbreak of war, when everything changed overnight.

Swent: And what was the date that you considered; that was when England entered the war? Was it 1940? I guess, Dunkirk?

Joklik: Well, yes. Germany declared war on Poland on the 1st of September, '39, and Britain declared war on Germany on the 3rd, two days later.

Swent: '39.

Joklik: And then came some difficult times. At four-thirty in the morning of the 4th, there was a knock on the door and two detectives arrested my father because of his Austrian nationality. He was released a month later, in October.

Swent: Where was he held during that month?

Joklik: At an internment camp some distance from Sydney. He was released in October, but in June of 1940, when the Germans invaded France via Belgium and Holland, he was re-interned and transferred to a camp in Victoria. He wasn't released until the end of the war. In those five years he aged twenty.

Swent: I presume he had no employment, of course.

Joklik: No. There was no more income. The assets of his firm were liquidated through quick sales, and a determination was made by a government agency as to how much of the proceeds was going to be used for sustenance of the family. Everybody in Australia was still assuming the war was going to be short. An allowance of eight pounds a week was determined. The car was confiscated, and my father's office was closed. Everything changed from secure to insecure.

Swent: You were allowed to continue at school?

Joklik: Yes. Although there was constant worry whether my mother could continue to afford the school fees. We moved a couple of times to successively more modest accommodations. Frugality became a way of life. My brother and I, though instinctively competitive, stuck together in tough situations. We were conscious of the need not to increase pressures on our mother. The weekly allowance of eight pounds was reduced to six pounds after a year or two and eventually discontinued. But before then, mother had gone out doing domestic work. You can imagine what harsh, physical work took out of her, an educated, thoroughly cultured lady. But she had pride and bore her lot with great dignity. Even then, she would find time to help us with our French or critique our English compositions--not perhaps the vocabulary, but certainly the logic and style of writing.

To keep us at Cranbrook, she arranged with the headmaster and the school council that our fees be reduced by half, with the understanding that the other half would be repaid at war's end. This was a wonderful gesture on the part of the school, prompted by their desire to keep my brother and me as students. We had already reached the top of our classes academically and were showing promise in sports. Perhaps the school anticipated a future dividend from our performance.

My mother repaid the arrears in school fees from her earnings as soon as she could after the war ended. A few years ago, my brother and I endowed the Helene Joklik scholarship at the school in her honor.

As my brother and I continued school at Cranbrook, we gradually made the transition from simply adapting, to contributing and, in some respects, leading--both in and out of the classroom.

Reverend F. T. Perkins, Headmaster

Joklik: When General Ivan Mackay went back to active army duty in 1940, a former headmaster, Reverend F. T. Perkins came in as acting headmaster. He was a respected classical scholar and former track-and-field star--a kindly man with a strong sense of fairness and an exacting teacher. He stayed on when Brian Hone later took over as headmaster and was my Latin teacher until matriculation.

A word of explanation about the education system, as it then functioned. The state of New South Wales had two standard public examinations which were administered at all schools, private and public--one at the end of Grade 10, for the Intermediate Certificate, and the other at the end of Grade 12, for the Leaving, or Matriculation Certificate. Results were graded as A, B, C or failure. Up to eight subjects could be taken for the Intermediate examination, and six for the Leaving. Two of the subjects for the Leaving could be taken at an advanced level called Honours, First class or Second Class. The best achievable examination results, therefore, were eight A's in the Intermediate and two First Class Honors and four A's in the Leaving. It would be false modesty not to mention that my brother and I achieved both.

Back, now, to Reverend F. T. Perkins. Under his guidance, Latin became my favorite subject. To him, the construction of a Latin sentence was the ultimate intellectual exercise, resulting in total satisfaction. Simply put, I got hooked. We worked hard at Caesar, Cicero, Livy, Horace and Virgil and enjoyed it. I also became enthusiastic about Roman history and culture. Needless to say, Latin also benefited my English composition.

I should have mentioned that almost all the masters [teachers] at Cranbrook had nicknames which they earned through some idiosyncrasy or distinctive mannerism. Reverend Perkins' nickname was "Polly," from so far back that I never discovered the origin.

Apart from grades in every subject each fortnight, we received class rankings and written masters' reports at the end of each term. Two of his report cards, when I was in eleventh grade at age fifteen read: "He is an example of a healthy mind in a healthy body" and: "He is daily qualifying himself for future command." Praise received, at the time, from one not given to superlatives.



For purposes of physical training, drills, intramural sports and other out-of-class activities we were divided into houses, each named after a former governor of New South Wales. My brother and I were in Strickland House, and "Polly" Perkins was our housemaster. He wasn't coaching track and field any more, but occasionally he would volunteer advice if he thought it worthwhile. On this particular afternoon, we were before the last event of an inter-house track meet, a 4-x-100-yard relay. I was to run the anchor leg, although sprints were not my specialty. Among others, I was up against Philip Dean who was the age-sixteen-and-under sprint champion. The general view was that unless I started with a seven- or eight-yard start, we would lose. Well, our third runner, a close friend with whom I had intensively practiced, gave me a perfect hand-off and a five-yard start over Dean. For once, I hit my stride almost immediately and pounded the track as never before. At the finish, I was still five yards ahead. "Polly" sauntered over, clearly tickled pink. He beamed at me over his gold-rimmed half glasses and just said: "I thought you could have got up on your toes a little sooner." You had to know him to appreciate that his thinking it worthwhile to dispense advice was more flattering than effusive congratulations would have been.

#### Sir Brian Hone, Headmaster

Joklik: In late 1940, or early 1941, a much younger man, Brian Hone, took over from Reverend Perkins, who had been the acting headmaster. Hone was later knighted and became recognized as one of the leading educators of Australia. He was originally from Adelaide, I believe. When he came to Cranbrook, he had spent some years as headmaster of a private school in England. Having been a Rhodes Scholar, he was also an outstanding athlete. I remember his first appearance at the daily school assembly, first thing in the morning. We were awed by his height, about 6'3", and encouraged by his relative youth. We thought he'd give a long speech and thereby give us a clue as to the liberties we could take with him. Instead he simply said: "I think there's a job to be done here" and went about reorganizing the school, with the result that, during his tenure, Cranbrook became known for academic and athletic standards second to none in Sydney. He demanded self-discipline and excellence, but also was constantly ready to help and encourage. When I matriculated, at age sixteen, he strongly urged me to repeat the year because of my relative youth; but in light of our financial circumstances, that wasn't possible.

I feel a deep sense of gratitude to other masters at Cranbrook. One I must mention is Ken Felton. His nickname was "Zunny," again of uncertain origin. He taught English and French --a kindly, cultured man with a quiet sense of humor. He took a personal interest in every student and had an astounding memory for their activities at school and their subsequent careers. He was, therefore, the ideal Secretary of the Old Cranbrookians' Association. He taught for almost sixty years at Cranbrook and kept on as OCA secretary until shortly before his death in 1989. He and his wife came to visit us here in Salt Lake City, and we worked with him in establishing the Helene Joklik Scholarship Endowment.

### Sports at Cranbrook

Joklik: I should say a couple of words about sports at Cranbrook. Sports were compulsory, with practice three afternoons per week, beginning after classes at three-thirty, and matches against other schools on Saturdays. The team sports were cricket and rugby football. I wasn't too enthused about cricket, although I could play a straight bat, i.e. defend the wicket. My reputation wasn't enhanced when I got clobbered, in fact laid out, by the boy next to me during bat drill and the headmaster, Brian Hone, had to pick me up and help me stagger to the infirmary.

But I was enthusiastic about football. Rugby Union is a little different from American football, in that you don't have to weigh all that much and wear a lot of gear. Mr. Hone had me play the position I was best suited for, scrum-half. The responsibility of the scrum-half is to transfer the ball smoothly from the scrum, in other words, from the forwards to the back line. You have to be quick or you'll get killed by their two loose forwards, called break-aways. The only way to avoid them is to dive towards the five-eight, the first man in the back line, and in the same motion, with both hands, feed him a torpedo pass to get him on his way. The five-eight, under pressure, passes the ball out to the next man, the inner center, then the outer center and, if no breakthrough has been possible, out to the wing, the fastest man on the team. He attempts to outflank the opposing wing, or break through with the help of an extra man from the forwards or his other wing, and score a try.

After most matches, the skin would be gone from my hips, due to diving on the hard ground, but when you're that young it only

takes a week to heal up. More serious was the occasion when I got caught under the scrum and broke my left arm. It had to be reset under X-ray which, at that time, was a fairly novel procedure.

I also made the school swimming and track teams. Mr. Hone had watched me train and decided that my stride was best suited for the 880 yards. I trained hard and became familiar with nausea of nerves before the start and the taste of blood in my mouth from exhaustion. But I loved the competition and the wave of euphoria from occasionally winning.

### Matriculation and University Exhibition

Joklik: Both my brother and I were made house prefects in our respective final years. We both matriculated with two First Class Honors (mine in Latin and chemistry) and four A's, well within the top percentile of candidates in the state, and both won Exhibitions to the University of Sydney. Exhibitions were scholarships awarded by the state to the top 100 matriculants.

[Interview 2: January 19, 1994] ##

Joklik: My Cranbrook years were precious. They were tough years, without my father, and full of sacrifice for my mother. But the school provided us with learning, growth and friendships, for which I am grateful.

Swent: So, after you completed Cranbrook, you and your brother were off to the university.

Joklik: Yes. I went out looking for a vacation job and found one at a department store in Sydney as a gofer in the tailoring department. The job was ripping up suits that had been poorly tailored and running errands for the boss. There were U. S. warships in Sydney Harbor, and sometimes I was asked to deliver uniforms to sailors. I would go aboard one of those ships, find the sailor I was supposed to deliver the suit to and he'd want to give me a tip! I'd explain to him that this was unnecessary, that he'd paid for his uniform and he didn't need to give me any money. It was only after three or four fairly awkward encounters that I realized tipping was customary in America. The work was not demanding. It didn't pay much either, but it provided a little income which was appreciated.

Then I began studies at the University of Sydney.

Swent: This was in the spring of 1944 or '45?

Joklik: That was the fall of '45. See, the seasons are reversed. The academic year started in February.

## II UNIVERSITY OF SYDNEY AND BUREAU OF MINERAL RESOURCES, CANBERRA, 1945-1953

Joklik: Commencing at the university was preceded by selection of a field of study. I had been attracted to the classics, especially Latin, but I recognized it was unlikely to lead to a career. I also liked chemistry, physics and math, which meant a choice between science, engineering and medicine.

### Choice of Science Curriculum

Joklik: It turned out to be a close call between science and engineering. I interviewed faculty members and decided to go for science. Math, physics and chemistry were mandatory. You were required to take four subjects, which necessitated picking an additional subject from among botany, zoology, biology or geology. I thought of botany, because Sydney University's Botany Department was headed by a man named Eric Ashby, one of the leaders in that field. He later went to Oxford and became Lord Ashby as a result of his brilliant research in botany and biology.

As it turned out, Professor Ashby went on sabbatical leave in 1945. I had an interview with him and regretted that I wouldn't have the chance to study under him. Under the circumstances, I decided to enroll in geology as the fourth subject.

I found a different culture at the university. At Cranbrook, courses of instruction were in relatively small classes, with much individual attention. University classes numbered a hundred, sometimes two hundred. The student body came from a variety of backgrounds. The environment was competitive because there were many returned servicemen, or veterans as we'd now call them. These men, and a few women, were several years



older than the students who came straight from high school. I was only sixteen when I started at university, and most of these people were in their mid-twenties.

Swent: They were already being furloughed out?

Joklik: Yes. This was 1945.

Swent: Had they been wounded?

Joklik: A few. Entrance to university was competitive for the recent high school graduates. There was a quota system, based on academic performance at matriculation.

Swent: And, of course, this was your first time having classes with women.

Joklik: Yes, that was an interesting experience. Women were outnumbered by men ten to one, maybe fifteen to one, but they were noticed. Since the course load was heavy, there wasn't a lot of time for socializing, once the day's assignments had been completed.

I had regrets that I could not take the advice of Brian Hone, our headmaster at Cranbrook, or of Professor Ashby. Both urged me to repeat Sixth Form, the final year at Cranbrook. That would have been a relaxing year.

Swent: You were very young.

Joklik: After the first few months, that didn't bother me. I was in the swim. It really wasn't a difficult adjustment.

First year went well. I received High Distinction in geology, Distinction in chemistry, Credit in physics, Pass in mathematics. You could only get a Pass or Fail in math--a calculus course. I suppose the High Distinction indicates geology may have been the easiest course.

Swent: Or that you especially liked it.

#### Attention to Geology

Joklik: I was ranked first in that class, an indication that I should pay attention to geology. The department was in a separate, ancient building on the campus. The faculty was renowned. The department was headed by Professor Leo Cotton, a stately gentlemen who had

achieved fame as an Antarctic explorer. He gave an introductory course in physical geology; the course material hadn't been revised for some time. I remember the discussion of the theories of Alfred Wegener. Professor Cotton told us that Alfred Wegener's then revolutionary theory of continental drift should therefore be disregarded. During the half century since then, Wegener's ideas have blossomed into the theory of plate tectonics which now governs geological thinking and instruction.

Swent: So you were at least introduced to it, in a negative way, but--

Joklik: It was an entertaining course. We had a demonstration of a geyser brought into the classroom and operated by a technical assistant who must have been in his seventies. We were both amused and impressed when this metal contraption periodically spouted up steam and water at the ceiling.

This was the year during which the war ended in Europe and Japan.

Swent: It must have been an enormous relief.

Joklik: Yes. It was. Australia was deeply affected by the war. The casualty rate was probably higher in Australia than in other countries on the Allied side. The Japanese invaded New Guinea and ran into stiff Australian opposition in the Owen-Stanley Range. Then came the Battle of Midway, the turning point of the war in the Pacific. Until then, there was a threat of invasion of the mainland of Australia.

Swent: There was actually bombing in Sydney Harbor, wasn't there?

Joklik: Yes. Darwin was heavily bombed. Submarines came into Sydney Harbor. These were midget submarines with two-man crews on suicide missions. They sent a torpedo under the keel of a cruiser and hit a supply ship which blew up. They also shelled the city. I still have a fragment of a shell casing I found.

During the summer vacation, at the end of first year, I got a job at the Sydney office of the Taxation Department. A bunch of university students were employed on a temporary basis to work with the local permanent staff who turned out to be a sociable group of young men and women. My job was to take each return, scan its contents and then write an identifying serial number on it. There was no such thing as social security numbers. We were given a certain quota each day. In four or five hours you could get that done and the rest of the time could be spent socializing.

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Joklik: I remember brilliant hot summer days, with the cicadas singing in the trees. At Christmas time, you had Christmas beetles invading gardens and sometimes houses. These were big bumbling beetles with beautiful golden brown wings and shells. You just picked them up and put them back outside. Everybody was fond of Christmas beetles.

Swent: I hadn't heard of them before.

Joklik: Then, second year at university began and soon afterwards, in March, my father returned from internment camp.

Swent: And where had he been at internment camp?

Joklik: In the state of Victoria.

Swent: So you actually hadn't seen much of him at all.

Joklik: Hadn't seen him for years. When he arrived at the little house where we lived, I hardly recognized him.

Swent: Had you been able to write? Had your mother been in contact with him by writing?

Joklik: Yes, there was an exchange of letters. But that didn't take the place of personal contact. It was difficult for him to find employment. The following summer, he went back home to Vienna, as did most of the other people who were released. It was tough, but he found his feet back there and with the help of former friends from Siemens started an export-import firm. He died young, at age sixty-seven.

Swent: Did your mother go back with him?

Joklik: Not at that time, but later she did. I had some wonderful times with my parents on visits back to Vienna. She died young, too. Anyway, what more can I say, except that I still miss them.

Swent: A different kind of war casualty.

Joklik: Yes, I guess. That's the way it went.

Swent: Had he been mistreated in the internment?

Joklik: Oh, no.

Swent: Well, of course, it's mistreatment just to be there.

Joklik: Second year university was a time during which geological excursions became an important element of the curriculum. We became a pretty closely knit group as a result of these trips. Some were just day excursions, others were three or four days at a time. Something to look forward to.

On campus, too, there were new friendships. Once a week there were movies at the University Union, at which comments on the movie being played were not discouraged. On one occasion, the scene was in Tsarist Russia; the guests at a banquet toss their champagne glasses over their shoulders against the wall. Just a week before, there was a student party at Palm Beach, just north of Sydney. The party got out of hand, involved broken glass and required police attention. So, as this scene took place on screen, I reminded the audience of Palm Beach, which caused guffawing. Social life did interfere with studies that year, and it required a big push, at the end, to recoup lost ground.

#### Vacation Job in Riverina

Joklik: That summer I took a vacation job, again with a bunch of other students near Griffith in the Riverina of western New South Wales, an irrigation area which was farmed for citrus fruit, other fruit such as peaches and apricots, and vegetables. The land was irrigated from the Murrumbidgee River. As you know, once you get away from the coastline of Australia, water gets scarce. Permanent water courses in western New South Wales can be counted on the fingers of one hand.

Swent: What was your job?

Joklik: Several jobs, as a matter of fact. The temperature almost every day was well over 100 degrees. The scenery consisted mostly of plains with low, blue hills in the distance that shimmered in the heat. Even on a calm day, there would be dust devils, or willie-willies as they were called, that worked their way across the plains. There were parrots of various kinds, particularly pink galahs that would start their concert early in the morning and awaken everybody with their shrieking. We slept in barracks and were awakened either by these birds, or by some practical joker who'd get up early and lob rocks on the corrugated iron roof of the barracks.

The work I did was varied. I started off fruit picking--mainly peaches and apricots. You'd be on a horse-drawn cart with a ladder on it. Occasionally the horse would move off with the

cart and you'd be stuck in the tree and have to find your way down. The next job I had was loading fruit into rail cars. We packed fruit in 80-pound crates and then had to stack these crates to above shoulder height in these rail cars. I must have weighed all of 140 pounds. If you failed and dropped a crate, the supervisor would wonder aloud whether you were really interested in the job and whether you'd rather just take your pay and go somewhere else.

But we learned a lot. I learned to drink beer, Australian style, which meant fairly large quantities.

Swent: Prodigious quantities!

Joklik: We had with us a few ex-servicemen. We had a man named Joseph Aloysius Maxwell. He had been in both World Wars and had won the Victoria Cross and Bar. But, with the attention lavished on him by well-wishers, he didn't fulfill his potential in peace time. He was working odd jobs around the country. He and I became friendly, but I realized he wasn't going anywhere.

I continued to be interested in sports. Of all the British Commonwealth countries that played cricket, Australia then had a "dream team"--a team of excellence that probably has not been equalled. It was led by Don Bradman, regarded as probably the best batsman that's ever played the game. Others were Lindsay Hassett, Keith Miller, Arthur Morris and Don Tallon; also Ray Lindwall, who was then the best fast bowler in the world. This team had tremendous national support and its members became legends.

### Majors in Chemistry and Geology

Joklik: Then came third year at university during which I majored in chemistry and geology. We went on a geology excursion northwest of Sydney in the Armidale region of New England. The Professor of geology at New England University, an outstanding petrologist named Alan Voisey, was in charge. Fortunately, Alan was a kindly man. One evening we had been out partying and came back late to the hotel. As it turned out, a group of traveling salesmen had a party of their own and did some things they shouldn't have. We got the blame the following morning. Alan Voisey called us together and said that, since there had been a police report on the incident, he felt compelled to send us back to Sydney, which could have meant expulsion from University. Fortunately he believed us and let us off the hook.



Swent: What was the potential at that time for geology? You wouldn't necessarily have had to go into mining.

Joklik: There were three career paths in geology--mining, petroleum and academics.

Swent: Were you beginning to get a sense then of direction and career?

Joklik: Yes. I was beginning to develop an interest in mining geology.

Swent: You mentioned that this man was a petrologist.

Joklik: Alan Voisey? Yes. And perhaps I should take a minute and talk about a couple of other faculty members. The most senior person, after Professor Cotton, was W. R. Browne, who was an expert on magmatic differentiation. This is the process by which a lithological suite, ranging from acidic to ultra basic, is derived from an original magma. He was a widower, I believe. Later, he married our paleontology professor, Dr. Ida Brown. They were a popular couple.

#### Geologist, Bureau of Mineral Resources

Joklik: At the end of my third year, I had my baccalaureate, my B.Sc., in geology and chemistry. During the summer of '47-'48, I took my first job related to my studies. This was with the Bureau of Mineral Resources in Canberra.

Swent: This would be the equivalent of our former Bureau of Mines, perhaps?

Joklik: Precisely. A branch of it was the nascent Geological Survey of Australia. Each state had a geological survey, but this was the federal government survey, based in Canberra. The permanent staff initially numbered only seven or eight geologists. The charter of the organization was economically oriented. It was meant not to duplicate the work of the state surveys, but to examine regions where ore deposits or petroleum reservoirs were likely to occur. The idea was to promote the mineral development of Australia.

Swent: Quite an exciting thing to be involved in.

Joklik: Yes. My first assignment was more prosaic and consisted of surveying a hill adjacent to the U. S. Embassy in Canberra. The embassy had just recently been built and was preparing for expansion.

Swent: Canberra was just a new city at that time, wasn't it?

Joklik: It was. Canberra was planned by an American architect named Burley Griffin. He laid out the city on a pattern of future shopping and business hubs, with residential communities in between and, ultimately, lakes or water reservoirs which would result from future dam construction. It was imaginative and, in retrospect, successful. At that time, Canberra had a population of 25,000. The city now has three or four hundred thousand. Back then, the residential communities were widely separated in the countryside. A car was essential to get around, but since we couldn't afford cars, we all rode our bicycles to get from our accommodations to our place of work and elsewhere. I don't know whether you've been to Canberra.

Swent: I have. I don't know it well, but I have just been there.

Joklik: It's now a beautiful city.

Anyway, we worked on this project by the American Embassy for a while. We were then deemed to have had our boot camp, so to speak, and were ready to go further afield. Bruce Walpole, a fellow student from the University of Sydney, and I were sent to Cobar in western New South Wales. Bruce was in the army throughout the war and became a lifelong friend. We still meet up and reminisce.

#### Geological Mapping in Cobar Copper-Gold Field

Joklik: Cobar was an old copper and gold mining field about 450 miles west of Sydney, in the semi-desert. The town had about 2,000 inhabitants and featured six or seven pubs. Our work consisted of mapping the terrain surrounding the copper and gold mines and making sense of their geological setting, with a view to predicting other occurrences of mineralization. The mines were in a series of en-échelon faults along a discordant contact between Silurian slate and sandstone. If you could define this pattern and extend it, you could predict other foci of mineralization that might be worth detailed mapping and exploration by diamond drilling.

As it happened, Zinc Corporation, which later became one of the components of CRA (ConZinc Rio Tinto of Australia), had a major exploration project in the area. They were assisted by a group of South African geo-physicists under the direction of Oscar

Weiss. This crew had state-of-the-art equipment, and were in demand all over the world.

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Swent: Did you have direct contact with them?

Joklik: Yes.

Swent: So you were actually learning from them.

Joklik: Yes. Because the summer was very hot, we partied extensively. There was a hospital there, a sort of bush hospital, staffed by nurses who were glad to join in our parties. I said to myself, "Boy if this is a geologist's way of life, it's not all bad."

Swent: And you were what--nineteen? Twenty?

Joklik: I was nineteen, I think.

Swent: It must have been a pretty heady time.

Joklik: Sometimes we'd watch the train which came in three days a week. The steam locomotive would come chugging along, trailing maybe half a dozen passenger cars and the same number of freight cars, doing all of twenty-five to thirty miles an hour. The locals, anticipating the kegs of beer that would come off the train, would appreciatively comment, "She's flying!" Only thirty minutes after the train came into town, beer from the kegs would be flowing through the refrigerated pipes in the pubs and the inhabitants would be breasting the counter, ready to savor the first drops. In between trains, sometimes, the town just ran dry, a tragedy that would cause great alarm!

We did succeed in making sense of the structural geology of the area. This work was right in line with my studies the following year.

Swent: Then in your senior year you did a--

Joklik: During my senior year I'd majored in chemistry and geology, and now I was contemplating an Honors Year, a fourth year, specializing in structural geology. I decided to do more work at Cobar and write my Honors thesis on this area.

We used to make beer money from rabbit shooting. This was before the days of myxomatosis, a disease imported from France to

try and kill off the rabbit population of the country. Wherever you went in the Outback, you'd see countless rabbit burrows.

Swent: Well, they tried rabbit fences, didn't they?

Joklik: Rabbit fences, which the rabbits had no difficulty burrowing under. We'd go trapping at nighttime, clear the traps in the morning, skin the rabbits and sell the skins.

#### John Sullivan, Chief of Mining Division

Joklik: That summer was the beginning of my association with John Sullivan. He then was in charge of the Geological Survey's mining division. The first time I saw him was in his Canberra office. He came ambling along and I thought, "It's Gary Cooper!" He was a long, athletic streak of a guy, walking in a relaxed kind of way. We hit it off from the start.

John spent time with us in Cobar and guided our work. He was a very good interpreter of geological data, a great synthesizer of information. He would draw conclusions that were not initially obvious to others; but once he'd explained them, they would say, "Well why didn't we see that?" He is also a well-educated person of broad interests including history, philosophy and international affairs. John has always been a person I could talk to for hours and feel I'd learned something. And that's still the case. He's retired now and lives in Toronto. We still keep in touch. He's one of the most highly regarded members of the Canadian mining community and has received many distinctions and awards.

Swent: He must be several years older than you.

Joklik: Fourteen years older. Our mapping at Cobar was based on aerial photographs. With the fairly sparse vegetation, you could identify individual trees. In terrain where normally you'd have to use a transit, or compass and chain, there you'd use enlarged air photographs. John taught us stereoscopic interpretation of photographs to pick out geological structures.

### Honors in Structural Geology

Joklik: I went back to university to begin my Honors Year in structural geology. My supervisor was Professor George Osborne, an expert in structural geology. He was a formal kind of man, of stout physique and a prominent profile; but a warm person once you got to know him. He was an excellent extemporaneous speaker, you might almost say an orator. In my Honors Year, we were a very small group. He would, nevertheless, lecture in his academic gown, pace up and down and draw extravagant sketches on the blackboard as if he were addressing a much larger audience.

Once you had finished your baccalaureate, once you got into Honors and Masters and Ph.D. work, the curriculum was less structured than it was in the United States. You were expected to have mastered the basics of your field of study. Emphasis was placed on reading, analysis, individual work and initiative. George Osborne set a wide variety of tasks unrelated to his formal lectures.

Some time after the beginning of the Honors Year, I returned to Cobar to build on the work we'd done there in the summer. Osborne came out in the field. So did John Sullivan, and Haddon King, who was then Chief Geologist of Zinc Corporation. Haddon, John and I took a ride in a small, three-engine plane, called a Dragon Rapide, to survey the Cobar mining field from the air.

It was exceedingly hot, over a hundred degrees, and there was a forty-knot wind blowing. To see what we wanted to we had to keep low, no more than 1,000 feet above the terrain. You can imagine the turbulence. I got sick as a dog. Nevertheless, we were going to complete the survey. In between checking the inside of a brown paper bag, I did get a good look at the countryside. When we eventually put down, I was ready to go back to Col Halliday's place. Col worked at one of the mines at Cobar and I was staying with him and his family. I was glad to get to my little bedroom and crash without undressing. Later in the evening John Sullivan came to check on me and I told him, "They died with their boots on." Next day, I was perfectly fine.

I worked on my own there for several months. I had a jeep and a tent and camped out. On one occasion, after breakfast, I went out on a traverse, about seventeen miles north of camp. I was speeding across the plain when, suddenly, I saw in front of me a deep drainage channel. It was too late to do much, really. The jeep rolled over. I had the hood down and was lucky not to get crushed. When I recovered my senses, I found my thigh wedged against the ground by the steering wheel. I thought it was



broken. I managed to extricate myself and found it was just badly bruised. It was late morning, and I limped the seventeen miles back to camp and even managed to do a bit of mapping along the way. That evening I hiked over to the property owner's homestead, another six miles away, and got a station hand to bring a truck. We used headlights to follow my tracks and pulled the jeep out of the ditch. Except for some spilled oil, there was nothing wrong with it, and I was able to drive it back.

Swent: Good heavens!

Joklik: It was a full day.

Swent: It must have been very alarming.

Joklik: I completed that project and then continued with my Honors Year studies at Sydney University.

Swent: Did this project go into the geology files at the Bureau?

Joklik: Yes. I wrote my Honors thesis on it.

The year finished with First Class Honors and the University Medal which is awarded in a discipline, once every few years, for outstanding work. I also received the Deas Thompson Scholarship.

Swent: And the date of this was?

Joklik: December 1948, when I had attained the ripe old age of twenty. The question was what to do next; whether to continue with the Bureau of Mineral Resources in a permanent capacity--my work at Cobar had been only a temporary student assignment--or whether to seek employment elsewhere. I sent off job applications to several places. One was to the Australian Petroleum Company which would have meant working on oil exploration in Papua New Guinea. They invited me to an interview at the company's headquarters in Melbourne, bought me lunch and offered me the job. I also corresponded with the Cerro de Pasco Company in Peru, with Tsumeb in Southwest Africa and the Emperor Gold Mining Company in Fiji.

In the end, I decided on further experience with the Bureau of Mineral Resources, based in Canberra. My first assignment was learning on the job. In the spring of 1949, a minor earthquake shook an area north of Canberra, centered on two small towns named Gunning and Dalton. Another new recruit and I were sent to determine the cause and investigate the damage which consisted of cracks in buildings, rotated tombstones in the local cemetery and some broken kitchenware and ornaments. Since there wasn't a history of previous seismic activity, the locals tended to be

over-excited by the extent of damage and prospects of compensation. Their welcome to us cooled when they found that our mission was scientific, not financial. The quake, we concluded, was due to isostatic adjustment of a fault block we mapped.

### Trilobite Hunt with Dr.Öpik

Joklik: About that time, the Bureau gained a valuable addition to its staff.

Dr. Armin Öpik escaped from Estonia, where he had headed the paleontology department at Tartu University. He was a renowned expert on Cambrian trilobites and wanted to explore the Cambrian terrane of the Barkly Tableland which extends from Tennant Creek in the Northern Territory to Camooweal in western Queensland. I was volunteered as his driver and assistant.

We met up in Tennant Creek, a gold mining town of a few hundred inhabitants.

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Joklik: The town is in what's called bull-dust plains, on which cattle graze and grind the dirt to powder. When you're driving through, you're in a huge cloud of dust. Of course, this was in April, the end of the wet season; so there were flies everywhere. You couldn't eat during the day, because as soon as you opened your mouth you'd swallow flies. Despite the heat, you'd wear nets to keep the flies off. Finally in the evening, you'd take the fly net off and take something to eat. There'd be a respite of an hour before it got totally dark and the mosquitoes came out--in hordes. Between the flies and the mosquitoes, you always had company. The plains were covered with spinnifex, a spiky kind of grass that forms large clumps. Where you had to traverse on foot, your legs would soon be covered by spinnifex pricks which sometimes festered.

We started off from Tennant Creek, not before we'd had a large party, including a dance at the local pub. The son of one of the mine owners was a fellow named Ward Leonard, an active young man with long fair hair. He insisted on wearing his tuxedo to the dance in Tennant Creek! Towards the end of the evening he said, "Frank, why don't we have a drink back at the mine?" We drove back there, and emptied a few more bottles of beer and he said, "Why don't you sleep here rather than driving back to town?" I said, "Where am I going to sleep?" He says, "That's easy!" The

beer was all gone but the straw casings were there, so he very carefully laid them out, maybe thirty in a row, and then another row and another; you can imagine in his state how long this took him and how funny it was watching him.

Dr. Öpik and I headed east from Tennant Creek. We were highly successful in our hunt for trilobites. We found some localities where you just split the shale open and inside were perfect specimens. Even though I had never had much of a yen for paleontology, I was quite turned on by this exercise. One locality which I understand is still well known, we christened the Three-Beer Locality. We were camped by a dry creek-bed fringed by white ghost gums. We were awakened by galahs screeching in the trees. I got up and grabbed my rifle. One bird was sitting on a branch a hundred yards away and Dr. Öpik said, "I'll bet you three beers you can't hit him." I ruffled his feathers before he flew away. And this place became known as the Three-Beer Locality.

Dr. Öpik was a highly cultured man, yet modest. He'd lost an awful lot during the war and afterwards, when he fled from the Russians. I remember in the evenings sometimes, when we had the campfire lit to cook our supper and to keep the mosquitoes away, he would wax poetic and recite Pushkin by the hour. He spoke Russian, as many Estonians do, and it was from the cadence of his voice that I guessed what the theme of the poetry might be, rather than the brief translations he'd give me periodically. I enjoyed my time with him.

Two or three years later, when I was living at a guest house about a mile from our office in Canberra, I'd been out to a party one night. At four in the morning one of my colleagues who was in the next room banged on my door and yelled, "The Bureau's on fire!" We could see flames shooting from the building. We flung on clothes, raced over and sounded the fire alarm. The building was pretty much gutted. But the tragedy was that Dr. Öpik's trilobite collection was annihilated. You know, I saw him later that morning when everything was a shambles. I thought he would be visibly devastated. Instead, he surveyed the damage and said, "Well, we will have to start over again." What a man!

Swent: What a tragedy!

Joklik: We worked our way from Tennant Creek east across the Barkly Tableland to Camooweal, a small cow town of about 200, on the border between Queensland and the Northern Territory.

Approaching Mount Isa in our one-ton Ford truck with our crates of fossils in the back, we came upon a pickup truck with three men from Mount Isa. They'd been out kangaroo shooting for

the day and their truck broke down. I hitched a tow rope to their truck and we started off again. It was getting dark and suddenly I saw a cow right in front of us in the middle of the road. Well, we hit the cow amid-ships. With the impact, we slowed down sharply, and the truck we were towing crashed into the back of us! Fortunately, no one except the cow was injured. We had to shoot her. We resumed towing and limped into Mount Isa. We headed to the Argent Hotel and visited the bar to regain our strength, and found they had plenty of beer but no glasses to drink out of because there'd been so many fights that all the glasses had been broken. So we went out to the truck, got our tin mugs, had a few drinks and parted good friends.

Of course, I went underground at the Mt. Isa mine. At that time, I believe--I'm not quite certain--the copper orebodies had only just been discovered. You see, the lead-zinc orebodies at Mount Isa were found in the thirties and eventually developed by Asarco, but the copper orebodies remained undetected. It was just a chance drill hole which broke through the contact between shale and dolomite, and passed from lead-zinc into copper mineralization.

#### Ph.D. Thesis Work in Harts Range, Central Australia

Joklik: The journey with Dr. Opik marked the end of my paleontological career. My next assignment, which began in July of 1949, took me to the Harts Range in Central Australia. What occasioned that assignment was the discovery of a radioactive mineral called samarskite in pegmatites, about 120 miles northeast of Alice Springs. A colleague of mine at the Bureau, Hector Ward and I were sent to assess the discovery because, at that time, uranium was very much in demand. Hector and I flew to Adelaide and picked up a Land Rover from the Department of Supply.

#### Use of Land Rovers in Northern Territory

Joklik: Land Rovers were new to Australia at that time. We had been using jeeps. We were asked to try out the first Land Rover in the Northern Territory. We drove to Port Augusta, where we put the Land Rover and several months' provisions on the Ghan. This was the train that ran a couple of times a week to Alice Springs through country formerly frequented by camel drivers from Afghanistan, hence the name "Ghan." There is no road from



Adelaide to Alice Springs. The Ghan would make several stops along the way, usually just a cattle or sheep station and a pub. The passengers would jump off, down several beers and get on the train again. The trip took a day and a half for the thousand-mile journey.

We arrived in Alice Springs, organized our provisions and drove out to the Harts Range. We based ourselves at the police station. You see, the Northern Territory had its own police force. A policeman would be located in some supposedly central position, hundreds of miles from the next station. He would be there with his wife and kids, if any, and be supplied periodically. He had the responsibility for maintaining law and order over thousands of square miles. At that time, the Northern Territory, which is twice the size of Texas, had about 10,000 inhabitants. Constable Bob Darkin and his wife, Vickie, were stationed at the Mica Depot on the north flank of the Harts Range. He had a truck and a string of horses. We set up in an old building next to the police station which had been used by mica miners to store their product and have it trucked out to Alice Springs.

The Harts Range is a terrane of Archeozoic igneous and sedimentary rocks. Some of the formations are intruded by mica-bearing pegmatites. This was the principal source of Australia's mica production. In those days, before synthetic substitutes, mica was indispensable as a dielectric, insulator and heat shield; there was good demand for it. The pegmatites are zoned and the mica occurs in specific zones. An understanding of the petrology of the pegmatites was considered important in identifying pegmatites that were likely to be economic. This became our mission.

Swent: You were primarily looking for the--

Joklik: Hector Ward and I first went to the southeastern part of the Harts Range to examine the discovery of samarskite. It took us only a day or two to recognize that this was an isolated occurrence. Since there was no size potential, there was no possibility that this could be a commercial source of uranium.

#### Flying Doctor Service

Joklik: We wired our results to Canberra. When I say "wired", we actually radioed. We were hooked into the Flying Doctor Service which was headquartered in Alice Springs. All the cattle stations had daily



"scheds" with the base to enable them to report their needs for supplies; or, in case of sickness, the doctor based in Alice Springs would fly out to examine and transport the patient. We had a transceiver with us in our Land Rover and sent out our message. We got back word from Canberra instructing us to stay in the area and begin a new project to survey the mica-bearing pegmatites and the regional geology of the area.

Swent: You were there for several months, then.

### Kangaroo Stew

Joklik: By then it was July, or mid-winter. We did regional mapping, visited the mica mines and became acquainted with their owners. The owners were mostly northern Italians. They were extremely hospitable people who were always prepared to treat us to good food and red wine. There were a few Australian miners, too. At the Eldorado mine there was a man named Mark Mitchell and his wife Dolores. Mark had been in the war and, after a few drinks, used to have some ugly tales to tell. His wife, Dolores, was half Filipino, half Chinese. He had met her in the Islands during the war and brought her back to Australia. Her fame spread because she was an attractive woman who'd worked as a night club entertainer. Dolores used to cook kangaroo stew. That, combined with Mark's home-brewed beer, was a powerful combination. To illustrate the sparse population in the Northern Territory, I once saw a letter addressed simply "Dolores, Northern Territory". That's all that was needed. The letter was sent from the Philippines, I believe. Just "Dolores, Northern Territory" and that was it.

We accomplished quite a lot during the remaining months before the "wet" which begins in November. It gets hot and once the wet sets in you can't move because roads turn to quagmire. We broke off and returned to Canberra. A noteworthy event was that the Labor Government that had guided Australia through the war, under Prime Ministers John Curtin and Ben Chifley, was defeated by a Liberal-Country Party coalition. Bob Menzies became Prime Minister and stayed in power for fifteen or sixteen years. He became one of Australia's most able statesmen and was recognized as such internationally. I met him on occasions in Canberra.

Also at that time, my mother left Australia with my brother who had finished his studies at Sydney University, and was awarded a scholarship to Oxford University to work on his Ph.D. My mother had continued to support herself in Sydney, but we agreed it was

time for her to return to Vienna and rejoin my father. She sailed on the Orcades, another P&O ship. I was left standing on South Head, at the entrance to Sydney Harbor, watching the ship disappear over the horizon. I was twenty-one.

Swent: Completely on your own now.

Joklik: Yes. It was after this first season in the Harts Range that I talked to Professor Marshall, who had succeeded Professor Cotton as Dean of the Geology Department at Sydney University, about the possibility of doing a Ph.D., using work in the Harts Range as a thesis subject, and doing it under the aegis of the Bureau of Mineral Resources.

Professor Charles Marshall was a coal geologist. He had come to Australia from England. He was an extremely energetic man with an executive deportment which was rare in academic circles. He breathed new life into the Geology Department. To his credit, he treated the older academicians from the Cotton era with consideration and respect, recognized their strengths and kept them on the staff of the department. He smoothed the transition from old to new.

Professor Marshall accepted the idea of my doing a Ph.D. In time, I also convinced Dr. Norm Fisher who headed up the Bureau of Mineral Resources. My friend, John Sullivan, of course, was all in favor. That's how I returned to the Harts Range for a second year, and subsequently a third. Ultimately, my Ph.D. thesis was based on this work.

I should point out that large parts of Central Australia were still unmapped. It wasn't a matter of going out there with a base map. All you had were logs of isolated traverses by 19th century explorers and a set of air photographs.

Swent: So you were actually employed by the Bureau of Mineral Resources.

Dr. Harold Raggatt, Director, Bureau of Mineral Resources ##

Joklik: Yes. That's what kept body and soul together. I couldn't have done without their help. I also talked about the support I received from Charles Marshall and Norm Fisher. Another person I should mention is Dr. Harold Raggatt who was the director of the Bureau of Mineral Resources. Norm Fisher was in charge of the Geological Branch, and Dr. Raggatt supervised the whole bureau.

Dr. Raggatt was an imposing, handsome person, always with a twinkle in his eye. Although he was a tough administrator, he was able to encourage his subordinates to excel. He made his mark in Canberra, became secretary of the Department of National Development and received a knighthood for his leadership of Australia's minerals industry. He deserved the accolade "a great Australian."

While I worked for the Bureau, Dr. Raggatt was always in my corner. Later, when I was with Kennecott and Amax, I used to look him up on my visits to Canberra. After he retired, he lived in a modest house on the outskirts of Canberra with his wife, Enid. The last time I visited him was in company with Ian MacGregor. He seemed well. I was the last to leave. He was gazing out at the mountains west of Canberra, the Tidbinbilla Range. He then looked at me steadily, gave me a covert wink and smiled with just a hint of sadness. He died shortly afterwards.

During the second year in the Harts Range, we defined the regional geological framework and mapped the formations in which the pegmatites occurred.

Swent: Now you say "we". Were you--you had a companion?

#### Field Party Chief

Joklik: Yes. The first year I had Hector Ward with me. In the second year I had two other geologists from the Bureau plus a cook and a couple of field assistants.

Swent: So this was your first "executive" experience, was it?

Joklik: Yes. We needed new air photographs since the ones we'd been issued had poor definition and did not clearly show access tracks, vegetation and other means of orientation.

As it happened, the 87th Royal Australian Air Force Squadron was stationed at Alice Springs to do aerial photography in the Northern Territory, using their Mosquito bombers. We persuaded them to fly the Harts Range as a priority. One of our geologists, Bob Searls had been in the Air Force during the war. Whenever we went to town, which was every few weeks, we'd head for their officers' mess. These fellows were very hospitable and we had some memorable parties.

The mountains in the Harts Range rise to a height of 4,000 feet above sea level. They are inhabited by a hardy breed of kangaroo called euros. The plains kangaroos, with bluish and reddish coats, are out in the flat country. We used to go out shooting at night with spotlights and sell the skins.

To do field mapping, we would traverse by vehicle as far as we could drive. We took our Land Rovers to places the manufacturers never thought they'd go. From there, we'd hike. Fifteen miles each way in a day was not considered unusual. We covered the country.

That was our second season in the Harts Range. The year was 1950. The war news from Korea was generally negative. The season took until October, when we returned to Canberra for the summer to work up the data.

#### Search for Lasseter's Lost Gold Reef

Joklik: I would have had time to relax, had it not been for the fact that a Sydney businessman, named Neville Harding, became fascinated by rumors of Lasseter's Lost Gold Reef, and mounted an expedition to which I was seconded as government observer. It turned out to be quite an experience.

Harding and his crew gathered in Alice Springs in January of 1951. They had several four-wheel drive vehicles: Chevrolet Blitz Buggies, plus several Land Rovers. We left Alice Springs much the same as the Burke & Wills expedition must have left Adelaide for Alice Springs a hundred years before, with the locals lined up outside the pubs, cheering us on as we headed west into the unknown, to look for Lasseter's Reef.

The background was this: In the early 1930s a prospector named Lasseter claimed to have found a dazzling gold reef in the desert near the border between Western Australia and the Northern Territory. He organized an expedition to relocate the reef and exploit it. When they got out there, they ran out of food and water; everybody turned back except Lasseter himself. His skeleton was ultimately found, as were the saddlebags of his camels and a diary containing directions for locating the reef. Several expeditions took place later in the 1930s. Lives were lost.

As we left Alice Springs, we followed a track through the desert to Ayers Rock.

Swent: It wasn't a tourist Mecca yet.

Joklik: It took several days to get out there over the sand dunes. We climbed Ayers Rock and scouted around. I found it consisted not of granite, as previously reported, but of arkose, a feldspathic sandstone. We continued west from Ayers Rock to the Docker River, which is on the border between Western Australia and the Northern Territory. There we ran into aborigines who'd been attracted by our dust and the smoke of our campfire. They'd never seen a white man before.

Swent: Really!

Joklik: They were totally naked and armed with spears and shields. But they weren't warlike; they just observed us closely for a few days and disappeared.

We prospected the Petermann Ranges on the border, pushed on west into the Rawlinson Ranges, but didn't find any gold mineralization. Our expedition had about twenty members. One of them was an experienced bushman named Burge Brown, who had run a cattle station in the Northern Territory and became a good friend. He would wake us at the crack of dawn with the cry, "Come on you bludgers! Brownie's men have got half a mile of fence up already!" Occasionally ants would find us, making it impossible to sleep on the ground. What we did then was excavate a narrow channel around a square, with the vehicles inside. We'd pour kerosene in the channel, set it on fire and then hop on the trucks to sleep. The ants would find us by three or four in the morning, and we'd get moving again.

The person who was supposed to lead us to Lasseter's Reef was named Jim Prince. He was a prospector in his fifties or sixties, with a strong taste for whisky. After we'd been through the Petermann Ranges, we'd say, "Jim, which way?"

We did find the cave where Lasseter spent his last days before he died because we saw his writing on the wall. He'd written his name and put "starving". How he died isn't certain. He either just plain starved to death; or, as others have said, the aborigines at first kept him alive, but he started messing with their women, so they "boned" him. Boning means they would get a sliver of mulga wood and, while the victim was drugged, slip the sliver in behind his ear. In time the wound would fester and cause the person to go insane and die miserably.

Swent: Oh, dear. Was this expedition part of the Bureau of Mineral Resources?



Joklik: No. It was organized by Neville Harding. Because they were going out into unmapped country, I was seconded by the Bureau to accompany them and do what surveying I could along the way.

Swent: Okay, I wanted to get that clear.

Joklik: We noticed that, as he was losing his bearings, Prince got more and more depressed. One evening I was talking to Brownie, and we worried about his state of mind. While he was asleep, we sneaked in and took the ammunition from his gun so he wouldn't do anything drastic.

We did not find Lasseter's Reef. I did map a lot of country where no geologist had been before and turned in a report which became Bureau of Mineral Resources Bulletin #10. We headed back, but we were low on food. We were down to eating wickety grubs, which are a fat kind of earthworm you could find by digging in the roots of mulga trees. We got to a cattle station on the way back, the Finke River Station, where we were given food by the station owner. Strangely, the one thing we wanted to eat was eggs. I remember we got some eggs and sucked them raw, because that was what seemed to be most palatable in our weakened condition.

Swent: My goodness!

#### Death of de la Valle

Joklik: I then returned to the Harts Range. And de la Valle died. Let me explain. Just twelve months before, on my twenty-second birthday, we'd been driving north from the southeastern part of the Harts Range towards the Mica Depot, a trip of about eighty miles. About half way along we were surprised by a cloudburst, and the road turned to mud. Our vehicles got bogged right up to the axles, and we spent three days digging and cutting wood to put corduroy under the wheels. We were making no progress.

Since we hadn't anticipated rain, we had little food with us and no water. By the third day--and remember we had been working hard physically--we were starving for food and drinking the mud in the bog. Finally, late that afternoon we saw this Blitz Buggy approaching. It was driven by a mica miner named de la Valle. With his vehicle's ground clearance, he was able to gun his engine and drive through the bog. He had provisions on board; the trouble was we were so famished we couldn't keep anything down. Nevertheless, the water and, in time, his food saved us that day.

The sad thing was that a year later, de la Valle again ran into extremely soft ground conditions at that very spot, got bogged, had an attack of peritonitis, couldn't get out and died.

Swent: This was the same man who had saved you the year before.

Joklik: Yes. Died within a hundred yards or so of where he rescued us.

Swent: Oh, my. It is not an easy country.

Joklik: That was sad.

Swent: Yes, indeed.

Joklik: During our third year in the Harts Range we concentrated on mapping the mica mines, most of which were underground. Some had been worked for years and abandoned. Safety was problematical. It was difficult to tell whether the roof would hold or not. The abandoned mines were infested with thousands of bats.

Swent: No. The smell!

Joklik: Bats and snakes. Fortunately it was cool underground. Since their body temperature was low, the snakes moved slowly. As long as you saw them first, they didn't present much of a threat.

John Sullivan came to see us and taught us the technique of underground mapping. We then worked our way through more than two dozen of these mines with intricate workings, both active and inactive.

One day we were mapping a small mine which we knew was only about a hundred feet deep and had a small drift off the bottom. Our way of getting down these openings was to put down a chain ladder. We usually tried to secure the ladder at the bottom to make it easier to get up and down. Clearly, the last man up had to undo the fastening and then had a tough climb back up.

That particular day, three of us had gone down. There were snakes at the bottom. I killed one of them and yelled to the guy at the top that I was finished with the mapping sheet and would he lower a tape and I'd attach the sheet. So, he lowered the tape and instead of the sheet, I attached the dead snake. Well, that was supposed to be funny.

My comeuppance wasn't long delayed. The other two went up first and I was left to climb up this unsecured chain ladder. All the work is with your arms. About seventy feet up, I got a cramp in my arms. The pain became so intense that I couldn't care less

whether I let go and fell or not. I remember what was going through my mind. At the last second I said to myself, "try bracing across the shaft." I shot my feet out, braced my back and just managed to bridge the shaft. It took the weight off my arms just long enough to recover and get to the top.

We finished mapping the mica mines and unravelled the petrology of the pegmatites. It was getting near the end of the season. We'd already had a little rain, and suddenly the desert came alive with rats.

Swent: Ooooh!

Joklik: Rats moving from west to east. We had a couple of cats in our camp which had been given us by mica miners. The cats would not go out at night; they used to sleep right by our beds. They were dead-scared of the rats. We used to sit up in the evenings. Our building we were in had a concrete floor and corrugated iron walls, with a gap in between. We used to sit there, quaffing a beer, with our rifles ready. As we saw a pair of eyes gleaming between the floor and wall, we'd just zap 'em. During the night, it was nothing to wake up and find a rat running across your body. The rats headed east and from one day to the next, they were gone.

Swent: Was this an annual occurrence?

Joklik: No. The locals told us it would happen every few years. They'd head east towards Queensland. The first river they came to, they'd pile in and drown, until they built a bridge of dead rats; the others would run across. After two or three river crossings, there weren't any rats left. A strange phenomenon.

Swent: What a hideous experience!

#### Laboratory Studies for Thesis at University of Sydney

Joklik: Yes. After the final season in the Harts Range, I returned to the University of Sydney to work on the material I'd gathered in the field. I set up a lab under the direction of Professor Charles Marshall. My thesis supervisor was a petrologist named Rutherford. I didn't get to know him well because he was on that first Comet flight from Sydney to Singapore; the plane crashed and he was killed. Remember that?

Swent: I'd forgotten.

Joklik: I then reported directly to Professor Marshall. I really got to work in the lab and put together my thesis which, afterwards, was published as Bulletin No. 26 of the Bureau of Mineral Resources. It was titled *The Geology and Mica Bearing Pegmatites of the Harts Range, Northern Territory*.

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Swent: Were you supposed to come up with some original--

Joklik: Yes. Advances were made in the genesis, petrology and structure of the mica deposits and the metamorphic history of the Archeozoic rocks of the Harts Range.

I discovered properties of minerals that had not been recognized before: also, some unusual effects of metamorphism. There were intriguing structural relationships, such as between lineation and folding. Regarding lineation, I got into a difference of opinion with Professor Alf Wilson of the University of Queensland, who had published material with which I could not agree. It was difficult for me to be critical, when he was one of my three thesis examiners.

Swent: Yes, indeed.

Joklik: Fortunately, Professor Francis Turner, a well-known petrologist from the University of California at Berkeley, was also one of my examiners and vindicated my work.

Swent: In what way was it of use to you later?

Joklik: I had become thoroughly familiar with important techniques of mapping and research which qualified me for work in industry or academia. The three-year project also taught me lessons in survival and leadership.

During the last session in the Harts Range, I had on my crew Tony Tomich, a Western Australian geologist who was very familiar with the Kalgoorlie gold fields. Apart from being a scholar and a gentleman, he was quick as lightning and accurate in underground mapping. We also had a geologist named Bill Roberts. He was an excellent man in the field and later worked up data in the office. Bill was bright and had a fantastic sense of humor. We became close friends.

Uranium Discovery at Rum Jungle

Joklik: Finally, I forgot to say that at the end of our first trip to the Harts Range in 1949, news broke of the uranium discovery at Rum Jungle in the Northern Territory, just south of Darwin. We received a wire from Canberra saying, "Proceed A.S.A.P. to Darwin and see whether this amounts to anything." Hector Ward and I hopped in our Land Rover and drove the rest of the day, all through the night and the following morning, a thousand miles on the Bitumen, as it was called, from Alice Springs to Darwin. The Bitumen had been put down by the U.S. Army during the war to improve Australia's defense capability. When we arrived at Rum Jungle, we went to find Jack White, the prospector who had made the discovery. He took us to his find--flakes of brilliant green torbenite in black shales.

We mapped the occurrence and concluded that the economic potential could be considerable. The prospect was developed in short order by Territory Enterprises, a subsidiary of Conzinc Rio Tinto of Australia. It became an important uranium mine which produced in the fifties and, with further ore discoveries, into the sixties.

Swent: Lots of exciting things.



## III FULBRIGHT SCHOLAR AT COLUMBIA UNIVERSITY, 1953-1954

Joklik: My thesis was submitted and the Bureau Bulletin published early in 1953. I had applied for a Fulbright Scholarship and, after interviews at the American Consulate in Sydney, was offered a scholarship at Columbia University beginning in the fall of 1953.

Swent: Our fall?

Joklik: Yes. Fall when the leaves fall. [laughter] On the 8th of August, 1953, I boarded a Qantas Lockheed Constellation, leaving Australia for the first time in sixteen years.

Swent: Your brother's still at Oxford?

Joklik: Yes. We flew at a relatively low altitude over Indonesia, Sombok, Bali and Java; and spent a night in style at Raffles in Singapore, at the airline's expense. Then on to Calcutta, Karachi, over the azure Mediterranean, the Gulf of Corinth, the Alps and on to Zurich. Two days after takeoff, we landed in Vienna, where my parents awaited me on a beautiful summer afternoon.

Family Reunion in Vienna

Swent: How exciting!

Joklik: Yes. I got reacquainted with my parents, the relatives, and with the city. It was a wonderful time. My brother was able to join us, too. For the first time in years, our family was united. We travelled to Innsbruck and hiked in the Alps. We saw numerous operas in Vienna in the Theater an der Wien. The Opera House was still being rebuilt in the aftermath of the war. After six weeks, I took my leave, flew to New York and made my way to Furnald Hall, the Columbia University residence featured in *The Caine Mutiny*.

There was a little mix-up at Columbia because they weren't aware that I'd already completed my Ph.D. They had a great faculty--people like Charles Behre, who was in charge of Economic Geology. He was a southern gentleman of the old school and made me most welcome.

We agreed that it would be best for me to enroll in courses that particularly interested me, for instance, economics, mine planning and metallurgy. I profited from that experience. Professor Nat Arbiter organized an excursion to northern New York State, where we saw a variety of operations, such as the Lake Tahawus ilmenite and the Benson iron ore mines. Our group included Ken Nagano, who later became President of Mitsubishi Mining Company and has been a lifelong friend.

#### Transcontinental Journey in '48 Plymouth

Joklik: In the second semester, a faculty member suggested that I might undertake a tour of major U.S. mines and ore deposits. It didn't take much to persuade me to go along with his idea, though he had a job convincing the rest of the faculty. I bought myself a 1948 Plymouth. One sign of its age was that it consumed large amounts of engine oil. I generally trailed a blue plume as I set off in March to begin my tour. The first point of interest was Lead, South Dakota. Lee, I can't remember the name of the chief geologist. Harding?

Swent: James O. Harder.

Joklik: Well, he received me hospitably. Another geologist's name was Joe Savage. Do you remember the name at all?

Swent: Savage? Not sure.

Joklik: Anyway, they gave me a great tour underground. I'd never been down such a deep mine.

I also met up there with Linc Page, a specialist in pegmatite geology. I'm not sure which--was he at the--

Swent: Yes, he was at the South Dakota School of Mines; at the time it was still called that.

Joklik: Yes. Well, I'd read his work on pegmatites. We got along famously.

Swent: But you didn't do anything with the mines in the East?

Joklik: Such as?

Swent: I mean you started with--

Joklik: Well, you know I'd been to Balmat and I'd visited the Elizabeth Copper Mine in Vermont. There wasn't much going on in the East.

Next was Climax, Colorado. I had several good days there, not realizing that later Climax would be important in my career.

Swent: Right.

Joklik: On to Gilman, where Spence Titley was chief geologist, and Jack Phillips was there. Then on to the Colorado Plateau. I was entertained by the Atomic Energy Commission people in Grand Junction. Bob Wright, I think, was in charge of that office. One of their geologists and I did a thorough tour of the Plateau, including Charlie Steen's mine.

Swent: Things were really exciting there then!

Joklik: I'll say! People were falling over themselves. Uranium was king.

Then on to Salt Lake City, where I went for a tour of the Bingham Canyon mine. Russell Anderson was chief geologist. On the morning we were there, an inversion had moved in and the pit was filled with smog. So we groped our way around for a few hours; it wasn't the most enlightening tour.

We went underground at the Lark mine which was still operating as a unit of the United States Smelting and Refining Co. On to Marysville. I can't remember the circumstance, but we nearly came to an untimely end in a shaft. Something fell and missed us.

At Ely, Nevada operations were still in full swing. Nevada Consolidated was Kennecott's first porphyry copper operation. The others were acquired later. From there I drove through to San Francisco. I visited my friend, Ron Lyon, at Stanford University. He was working on his Ph.D. We went out on the town.

I then set about selling my Plymouth which I'd bought for \$80 in New York. I sold it in San Francisco for \$80, which was just enough to cover my airfare back to New York City.

I then faced a career decision. Was I going to try and join Kennecott? My friend and mentor John Sullivan had, in the meantime, made a commitment to leave the Bureau of Mineral

Resources and join Kennecott in Canada. Would I go with John or would I work for Monsanto Chemical Company in St. Louis? They'd interviewed me and made me an offer. They had a technical raw materials division and wanted me to join.

The way I finally made this difficult choice was to put letters of acceptance in my briefcase, go down to the mailbox at 113th Street and Broadway, reach in and toss one in the mailbox.

Swent: So which letter stayed in the briefcase?

Joklik: Monsanto.

The apartment where I'd moved from Fernald Hall had seven bedrooms. I shared the place with Bob Stebbins, who had worked as a geologist in the Coeur d'Alene District; Len Jacob, who eventually became chief geologist with Alcoa, took early retirement and, until the civil war there, ran a columbite mine in Rwanda; and Bud Stimson who studied medicine--I understand he's no longer alive.

We used that apartment well. We threw a Christmas party and invited 130 people, expecting that maybe half would come. Actually they all came and brought friends.

## IV KENNECOTT PHASE ONE--EXPLORATION GEOLOGIST, 1954-1963

Swent: And you joined Kennecott as a junior geologist.

Joklik: Yes. The pay was good. These days, everybody recalls how they worked for a pittance, all those years ago. If they took inflation into account they'd probably find that the equivalent position is less well paid today than it then was.

Swent: How much were you paid?

Joklik: I'm trying to recollect. \$5,000 per year?

Swent: That sounds pretty good.

Québec Office; Search for Paul Imbault

Joklik: Kennecott had a small exploration office in Québec, with three or four geologists. A mining engineer, Carl Kamm was in charge. He was a strong, quiet, caring individual, a self-disciplined man with great integrity. I rapidly became closely acquainted with him because, two days after I got there, we received news that the senior geologist in that office, Paul Imbault, and a canoe man were missing on Cassé Lake, on the north shore of the Saint Lawrence.

Mike Parker and I volunteered to join the search. Mike was the son of the heir apparent at Kennecott. The president of Kennecott and Mike's father, and eight other senior people had recently been killed because some crazy guy put a bomb on their plane.

Mike was my field assistant for that summer. He and I hopped in a car and spent a couple of days combing the shores of Cassé Lake and the river that flows from it, looking for Paul's



body. I had no bush experience in Canada. We fought our way through thick alders on slippery rocks along the shore of a swift flowing river. The water temperature was freezing. We wouldn't have lasted more than a couple of minutes in the water and repeatedly came close to falling in.

In the end, we didn't find the body; but Quebec Hydro had built a weir across the outflow from the lake and, late one evening, as the setting sun was sending rays through the water, we saw the canoe wedged against two uprights. We returned to Québec. The bodies came up two weeks later.

Shortly after that, Mike and I left Québec city with the mission of finding copper deposits on Gaspé Peninsula.

If I may, I would like to interrupt here for a couple of minutes to talk about Kennecott.

Swent: Right.

Joklik: Kennecott in 1953-54 was a different company from what it later became or what it is today.

Swent: I just wanted to say, that plane accident you mentioned had enormously far-reaching consequences in the whole industry.

Joklik: Yes. Charles Cox was brought in from U.S. Steel as the president. He had no experience in the mining business.

Swent: I think most companies at that point gave up sending their entire executive corps in one plane.

#### Kennecott--A Widows' and Orphans' Stock

Joklik: Yes, that's true. Kennecott in 1953 was a widows' and orphans' stock, no pun intended. The company made good profits year in and year out. For instance, in 1953 they made \$88 million and distributed \$69 million to stockholders.

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Domestic copper demand substantially exceeded supply. U.S. primary production was about a million short tons a year. It needed another half million tons of imports to satisfy the demand of 1.5 million tons of newly mined copper.

Swent: Let me think, the Korean War had about ended.

Joklik: Right. An economic recovery followed the war. Demand was strong and Kennecott's production was at a rate of 600,000 tons a year, of which 150,000 tons came from Chile.

Swent: Was Jim Boyd there then?

Joklik: Yes.

Swent: You'll get into that.

Joklik: Yes. I just wanted to set the background. Lee, you expressed an interest in technology. You'll be interested in the 1954 report which says that at Ray mines 50-ton diesel trucks had replaced 35-ton trucks. And at Utah Copper, the use of mobile drilling rigs had just made possible the elimination of sixty-five miles of compressed air lines in the pit.

Swent: Oooh! How things have changed.

Joklik: Yes. The price of copper rose to the highest level since the Civil War, to 43 cents per pound. Kennecott's net income topped \$125 million. Yet, expenditures on plant and equipment were only \$16 million that year. Isn't that something? \$125 million of income and only \$16 million for plant and equipment. The seeds of neglect were already being sown.

Swent: Easy to be complacent in a situation like that.

#### Jim Boyd, Vice President, Exploration

Joklik: Exactly. You just asked about Jim Boyd. Jim was the man who hired me. He had just replaced Anton Grey as vice president of exploration, after resigning as director of the Bureau of Mines.

I needn't comment on him because your oral history of Jim is comprehensive.<sup>1</sup> He struck me as a dynamic leader, an involved and interested person, a straight arrow, though in no sense naive. He remained a life long friend. The last time Pam and I saw Jim and

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<sup>1</sup>James Boyd, Minerals and Critical Materials Management; Military and Government Administrator and Mining Executive, 1941-1987, Regional Oral History Office, University of California, Berkeley, 1988.

his second wife, Clemmie, was in '87 when they came and stayed with us here in Salt Lake.

In 1952, Jim launched a worldwide exploration program for Kennecott. To beef up the effort in Canada, he hired John Sullivan as head of exploration in that country. That's why a job was available for me at Kennecott after my stay at Columbia University.

### Exploration for Copper on Gaspé Peninsula

Joklik: And so my first field season on Gaspé Peninsula began. It was Mike Parker and I against the mountains, forests and thick, wet bush--quite a change from the semi-desert of Central Australia.

Swent: And some insect hazards.

Joklik: They ate you alive, as you well know. And we had close encounters with black bears.

To guide our exploration, we drew analogies with Noranda's Gaspé Copper mine which then was under development. With ore reserves of 60 million tons running 1.3 percent copper, Gaspé Copper became an efficient integrated operation.

Fenton Scott was chief geologist. The mine manager was Bill Brissenden. Mineralization occurs in the Devonian Grand Grève and Cape Bonaventure formations. We chased those formations all over, looking for alteration similar to what we saw at the mine. We flew an airborne electro-magnetic [E.M.] and magnetometer survey, based in Mont Joli on the south shore of the Saint Lawrence. We had a Canso of Hunting Geophysical Surveys based there.

Swent: I'm sorry I missed that--Canso?

Joklik: Canso, a kind of aircraft. Also known as a Catalina flying boat--very slow but very stable.

Swent: Oh. Okay. That was the airplane.

Joklik: Yes. It carried a magnetometer and E.M. equipment, as well as a radiometer, and covered the part of the peninsula we were interested in. The captain, Colin Grant, happened to be an Australian. We had a good time at the hotel where we were holed up with the crew, some of whom had been involved in building and operating the DEW [Distant Early Warning] Line in northern Canada.

That was my first field season on Gaspé Peninsula. I returned to the Québec City office for the winter to record the results.

Escape to Australia; Titanium Beach Sand Discovery

Joklik: But John Sullivan and Jim Boyd knew of several projects in Australia they wanted me to take a look at. I flew to England and embarked on the *Stratheden*, another P&O ship, and sailed for Australia. John sent me a rude cable on the ship's radio, but since we were already on the high seas he was too late. The trip took five weeks and was the kind of R & R that, in my judgment, I needed.

I'm kidding. John wasn't really mad at me.

Back in Australia, after an absence of a year and a half, I felt very much at home. I looked at the tin deposits and other exploration targets Kennecott had identified but found they didn't have much potential. What did turn out to be worthwhile were beach sand deposits containing rutile, ilmenite and monazite. The beach sand industry was just starting up in Australia. There was excellent ground still to be acquired.

Swent: This was titanium?

Joklik: Yes. I outlined prospective stretches of the eastern sea coast. Unfortunately, Kennecott was more interested in beach sand deposits in Florida, which turned out to be of no commercial value.

Swent: Kennecott's exploration at this point was--well, how would you describe it? They were trying to diversify.

Joklik: Jim Boyd was in favor of diversification, but the question was how much support he would get from Kennecott's management. There was a saying in Kennecott "You can look for anything as long as it's copper." There was a hiatus between exploration and operating management. Charles Cox, with his limited background in mining, found it difficult to bring the two functions together.

Swent: Very frustrating, wasn't it?

Joklik: Yes. The ilmenite mine at Allard Lake, on the north shore of the St. Lawrence, was the only diversification that had taken place. This mine supplied the Québec iron and titanium operations.

I came back from Australia with my mission not accomplished. There was a real opportunity in the beach sands which wasn't followed up. At that point, I formally took my leave of the Bureau of Mineral Resources and Canberra. Of course, I had, and still have, friends there. It was a difficult separation.

Fortunately, I took every opportunity on these international trips to stop off in Vienna and visit my parents; fortunately, because they didn't live much longer.

I went back to Gaspé Peninsula the following year, 1955, with a junior geologist and field assistant. We continued mapping and actually found an area of hydrothermal alteration that had similarities to Gaspé Copper. The location was just south of the township of Gaspé and we decided to do some drilling.

#### Hepatitis in Gaspé

Joklik: By then, it was late in the year. I went to Toronto for Christmas. I usually stayed at John Sullivan's house because I was regarded, more or less, as a member of the family. I got back to Gaspé and was walking down the main street when I ran into my friend Yves Fortier, the local doctor. He looked at me and he said, "My God, Frank! You've got hepatitis! Come to my office!" Within minutes he had confirmed his suspicion. He checked me into the hospital and, sure enough, I got sick as a dog. I wasn't carrying much weight, but still lost thirty pounds.

Swent: And you hadn't felt ill until then?

Joklik: No. I was discharged after two weeks and continued to supervise the winter drilling program. That's how I came to take up skiing. Buddy Hyman, whose father ran the local general store said to me: "I'll bring you a pair of skis; try them out and maybe that'll put you back in shape." Just behind the hospital there was a hill. I put those hickory skis on with their spring bindings, packed myself a little piste on the hill, hiked up, skied down and eventually learned to turn.

The drilling program discovered some copper, but not in payable quantities. Our interest then turned to northern Québec.



### Differences in Training of Economic Geologists, U.S. vs. Australia

Joklik: Earlier, I mentioned that five-week boat journey from England to Australia. I took time out from the busy social schedule aboard to write a paper comparing the training of economic geologists in Australia and the United States. The paper was subsequently published in an Australian journal named *Chemical Engineering and Mining Review*. I wrote that at the undergraduate level, Australian universities pushed students faster and made them specialize earlier than U.S. schools do. Graduates from, say, the University of Sydney were, therefore, better prepared to go out and earn a living in their field than would graduates from Columbia University, for example.

Swent: Did you meet some undergraduate students at Columbia?

Joklik: Yes. But the balance changed in the postgraduate schools. Proportionately fewer students went on to higher degree work in Australia than in the United States. Postgraduate curricula in the United States were structured and thoroughly covered the field of study from the basics through to doctoral standards. It goes without saying that the postgraduate schools in the United States were far better endowed than were their counterparts in Australia. Recent observations at two universities here in the western United States [Stanford and University of Utah] suggest to me that overly aggressive fundraising from industry and government for the benefit of research projects that support postgraduate students may unintentionally starve undergraduate education, especially when the total pool of funds available for education is shrinking in relation to the national economy. During the coming years, more attention to the balance between the needs of undergraduate and postgraduate education may be beneficial.

### Exploration Project Manager, Northern Québec

Joklik: Our exploration program in northern Québec was based on the towns of Amos, Val d'Or, Senneterre and Rouyn-Noranda which are in the heart of Québec's gold country. We had singled out an area embracing three basic intrusions in the Keewatin volcanic sequence for its copper and gold potential.

This area was attractive because of similarities with both Sudbury and Chibougamau. The largest of the three intrusions is the Bell River Complex.

Crew Member, Sir Terence English

Joklik: We established base camp at Lake Lessard. Our crew included Terence English who had studied mining engineering at Witwatersrand University. He originally came from a farm in South Africa and claimed he didn't put shoes on until he was twenty-one years old, but I never really believed that. Terence worked with me for three successive seasons. He had an uncle in London who was a doctor and persuaded Terence to study medicine at Guy's Hospital Medical School. During his first two years at Guy's, he was captain of the rugby team. On one occasion after a victory celebration, he packed the whole team into his 1923 Rolls Royce, which he had bought very inexpensively, and accidentally ran onto one of those pedestrian refuge ramps in the middle of the street. All four wheels came off the ground and the car had to be pulled off by the constabulary.

Anyway, after two years, with his budding medical career in jeopardy, he decided to get serious. The following year, he headed his class in anatomy. He became the first man to do heart transplants in England, was elected president of the Royal College of Surgeons and was knighted recently.

Swent: My goodness!

Joklik: Terence later was best man at our wedding.

Our field assistants were under the leadership of a French-Canadian named Robert Guay. He was one of the most loyal and capable people I've ever worked with. He excelled as a line cutter, packer, canoeist and all other important functions.

We hit the ground running and covered a large area. Initially we carried out a helicopter-borne magnetometer and E.M. survey. The helicopter had a magnetometer installed in it, but the E.M. coil was in a so-called "bird" that was trailed beneath the aircraft. The pilots aimed for minimum terrain clearance and frequently got the bird hung up in trees. Progress of the airborne survey, therefore, was slow.

Swent: Were you flying in the helicopter?

Joklik: Yes. We followed up on the ground and worked long days. Our work there continued after a hiatus of a year, during which we got involved in Ungava. I should record, though, that in the interim, on November 18 of 1956, my mother died in Vienna, only sixty years old; I went over for the funeral. That was difficult.

Swent: It must have been.

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Joklik: Ungava is the name for far northern Québec Province.

Right across the northern tip of the province, between Cape Smith and Wakeham Bay, is a corridor of volcanic rocks in which the Raglan nickel deposits occur. The Québec government cut that strip up into hundred-square-mile exploration concessions and put them up for bid. Kennecott successfully bid for one. This summer of 1957 then, Terence English and I headed north to assess its mineral potential. That was an intensive effort because the summer was so short that we had to do long traverses every day to cover the concession adequately.

It was beautiful country, with lakes of dark blue water. For the most part you were walking on a carpet of yielding moss. There were grey cliffs with all kinds of birds--falcons, loons, Canada geese, ptarmigans.

Swent: You were trying to do it only in the summer? I thought some people did their exploration in the winter up there.

Joklik: You can't see a thing under the snow cover.

Swent: Yes, but with your magnetometer, you can--

Joklik: You can fly airborne surveys. Now, when I talk about diamonds, thirty years later, I'll have more to say about exploration in the far north.

Swent: Okay, so you were in Ungava.

#### Observations on Canada's National Identity

Joklik: The concession turned out to be devoid of mineralization, except for asbestos. But the fiber was not of the right length or quality. That fall, then, we returned to Québec City. Let me just comment about Québec and Canada in those days. Québec City is the citadel of the French-Canadian culture; it had about 300,000 inhabitants then and has 600,000 now.

Swent: Did you speak French?

Joklik: Yes. I don't think my French improved much because French-Canadian is different, as you know. There was already strong support for separatism. Henri Lévesque, who later became premier of the province, led the separatist movement. He was a journalist at the time I knew him; an intense man, almost fanatical.

But Canada, as a whole, seemed like a population looking for identity as a nation. When you consider the narrow spread of latitudes within which the country is sandwiched, between the Arctic to the north and the U.S. border to the south, it's difficult to gain an impression of cohesiveness amongst peoples spread out along 3,500 miles. I almost sensed that it might be best for Canadians to eliminate the border with the United States. [laughter] There wouldn't have been much support for that point of view.

Swent: It's always been a kind of open border.

Joklik: Yes. But, separatism is still an issue, as was demonstrated in the referendum of October 1995. Canada still is, to some extent, a nation looking for its identity. Australia, by comparison, has a clearer image.

Swent: Were you still an Australian citizen?

Joklik: Yes.

Swent: So your work papers would not be a complication, as you were a member of the Commonwealth.

Joklik: Yes. You had to have a work permit, but it wasn't hard to get. You just obtained it at the border.

### Injury Leading to Garon Lake Discovery

Joklik: Well, in the fall of '57, after our experience in Ungava, I decided to follow up the fruits of the airborne survey in the Lake Lessard area from the year before. On the tapes of the E.M. survey I detected a small anomaly which had, despite its small size, important characteristics, such as the ratio between the two frequencies the survey was flown at.

Terence English and I established a camp on the Bell River, close to the location of the anomaly, just west of Garon Lake. We brought in our former crew under the leadership of Robert Guay and

Jack Lusko. We also included two geophysicists from Toronto, Hal Fleming and John Proudfoot.

We staked a block of claims over the anomaly and began line cutting. On this particular morning, which I believe was October 2, I was busy cutting a north-south line. My nearest neighbor was Robert Guay who was cutting a parallel line 400 feet to the east. He was an expert axeman and some distance ahead of me.

I came to a little mound on which a stunted spruce tree was growing. It was late in the season and I could see ice on the trunk. I leapt up and took a back-handed swing to cut through the spruce; the axe glanced off the ice and sank into my boot.

As I looked down in surprise, blood began spurting up. I sat down, my mind racing. I pulled the boot off and could see the white bone laid bare. I yelled out to Robert. He raced over and put a tourniquet on my thigh. A tourniquet! I mean he took off his suspenders and wound them around. It started snowing, which was a blessing, because it froze my foot and numbed the pain.

They fashioned a stretcher out of two small birch trees and started carrying me towards the shore of the Bell River, several miles away. For the next few hours, all I saw was their backs straining and the clouds above; all I heard was their panting. It was terribly hard work. They made progress. One guy ran to the camp and called for a plane from Amos on the radio. The weather was bad; the ceiling was down to about 300 feet. We'd been going for about two hours; every twenty minutes or so I'd loosen the tourniquet to get plenty of blood flowing from the foot.

We were still a long way from the river when we heard a plane engine. It was a Cessna 180 from Gold Belt Air, which was the service we used out of Amos. We saw the pilot fly over and do several passes at tree-top level looking for us. We tried to attract his attention, but he couldn't see us. Eventually, we heard him land and take off again. I thought, "My God, he's gone!"

When we finally reached the shore, we found he had reconnoitered in another direction and returned. He'd been in the Luftwaffe and was used to flying in any conditions. He certainly was way below the legal limit for flying that day. They lifted me on board. It was getting dark. I rested on the floor. It took about forty-five minutes to get down to Amos. There was an inch of blood sloshing around in the back of the plane.

We were met by an ambulance, the first ambulance ride I'd had. I enjoyed the siren. We got to the hospital. I remember



Dr. Bourgault coming in. The first thing he did was sniff my foot to check for gangrene. Then they wheeled me to the operating theater. The following morning I didn't know whether I still had my foot or not. Hal Fleming was there. They'd given me sodium pentothal anesthetic, but even then I wasn't feeling too good. He said, "You're okay."

The hospital was brand new. As luck would have it, the inhabitants of Amos had voted the right way at the last election. Maurice du Plessis was the premier of Québec; he'd been in power for twenty years or longer and communities that voted for him tended to be rewarded. Amos got a brand new hospital which was overstaffed and under-occupied. I was in there for six weeks and, believe me, it wasn't tough duty.

Swent: How nice. How very fortunate.

Joklik: While I was in hospital, the first Sputnik was put up. There was great consternation in North America. How could the Russians be so far ahead? As you know, that event caused President Kennedy to set ambitious targets for space exploration.

Swent: That was in 1957. You certainly have had a lot of close calls!

Joklik: I got out of hospital in due course, but then they found there was a misalignment of the bone structure. I had to go to Toronto, to St. Michael's Hospital, get the foot cut open again and reset. That took another month or two.

I went to Vienna for Christmas, which was my first visit since my mother died. My father helped me hobble around. We very much enjoyed each other's company.

The following summer we went back to Garon Lake and drilled the anomaly. It turned out to be a neat little discovery, about 300,000 tons of good grade copper ore. It was too small for Kennecott. They sold it to Conwest, who duly mined it out in an open pit. The orebody was a classical, massive sulfide deposit in the Keewatin volcanics. This discovery spawned the Matagami rush during which several other deposits were discovered and mined, the main one being Matagami Mines.

Swent: And you spotted it first.

Joklik: I suppose.

Swent: Were you getting any sense at this time of the organization of Kennecott, or were you--of course, you were pretty far removed from the head office.

Joklik: There were discoveries being made by Kennecott in western Canada, but they were not brought into production. Exploration was being treated as a separate exercise. The people who operated the four great copper mines--five with El Teniente--weren't really interested in new discoveries.

Jim Boyd was the standard bearer for exploration. He had a tough row to hoe. He had to defend his budgets, generate discoveries and attempt to sell them to management.

Swent: This must have been a little disappointing to you, to find a nice project and then not--

Joklik: Yes, although I got a small bonus. As a matter of fact, I even wrote to President Cox, though I hardly knew him, thanking him for the bonus and saying what a great job I felt John Sullivan was doing. John rang me immediately and said, "I saw a copy of that letter. What the hell are you trying to do, get me fired?" [laughter] No one particularly wanted to attract Mr. Cox's attention.

Swent: Was this the custom: to give a bonus to someone who discovered something?

Joklik: Someone who had done original work. It was payment for perceived initiative.

Swent: So, you were making notes as you went along--how to run, or not run, a company?

Joklik: I never had any doubt about how to run anything, really.

Swent: Well, all these things were feeding in, though.

Joklik: Oh, yes.

### Recuperation at Zürs

Joklik: At the end of the year I again went to Vienna at Christmastime. My father staked me to a couple of weeks of skiing. I went to Zürs, stayed at a pleasant hotel, and learned the Arlberg technique of skiing. The weather was atrocious. Throughout my stay, the sky never cleared enough to see the mountains. But, I can tell you, I learned. I had to learn. The instructors were Russian Front veterans. They were sparing with praise. Criticism was explicit. After we'd practiced turns under supervision,

they'd usually say, "Okay, hike up again. Don't use the lift." Well, at the end of two weeks I was in incredible shape--

Swent: And your foot was able to tolerate all that?

Joklik: Yes. I remember leaving Zürs to take the train back to Vienna. I thought it's been a great experience, but this is enough.

Anyway, I returned to Québec. We selected one more patch of the Proterozoic terrane with favorable indications of mineralization. The geology was right. This was about 130 miles northeast of Val d'Or, or 100 miles north of Senneterre. We established camp on Lake Héléne, which happened to be my mother's name.

We worked hard on those long summer days, sweating in the heat, or soaked to the skin by cold rain storms. Back at camp after dinner, rewards came. On calm evenings, I'd take a canoe and quietly paddle on the lake. The forest would glow in the late sunshine. The still water reflected infinite peace, when every fish rising, or even insect landing, would create circles visible for a hundred yards.

We flew the area, got some promising anomalies, staked them, and followed up. It was a field season in which everything was done according to the book. But in the end we didn't find anything. The anomalies turned out to be part and parcel of what was called the Marceau lineament, which is a conductive magnetic zone coinciding with a band of metamorphosed Keewatin sediments and lavas. The anomalies turned out to be pyrrhotite, graphite, conductive glacial overburden and saline deposits--anything but base metal sulfides we were looking for.

Swent: Oh, dear.

#### Farewell to Parents

Joklik: Towards the end of summer, in September, I happened to be in Toronto on a visit. I got a wire saying that my father had died in Vienna.

Swent: Not long after your mother, then.

Joklik: Three years later. I flew over for the funeral and met up with a lot of friends with whom he had consorted all his life.

Swent: Was your brother still--

Joklik: He was in Australia. After his Ph.D. at Oxford, he went to the Australian National University, Canberra. It was too far for him to come.

Swent: So you weren't seeing much of him, then, at this time?

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Joklik: No, but that also changed with time.

Contribution to Okonite Case Defense; "Copper Mines of the World"

Joklik: Meanwhile, Jim Boyd had read my report on exploration in Québec. He complimented me and suggested that I come to New York to help with Kennecott's defense of the Okonite acquisition. As you may recall, Kennecott was in the fabricating business. The operating subsidiaries were Chase Copper & Brass and Kennecott Wire & Cable. To beef up Kennecott Wire & Cable, they bought the Okonite Company which was one of the major manufacturers of wire and cable in the east. The FTC attacked that acquisition as being anticompetitive. Kennecott set out to prove they did not have a monopoly in any segment of the copper industry. They needed someone to prepare an overview of the world's copper mining industry. Jim thought I could write reasonably well. That's why he wanted me to come to New York in the autumn of 1959.

I rented an apartment on East 64th Street from a Mrs. Moran who was the widow of the owner of Moran Tugboat Company, the largest in New York Harbor. She was a kindly woman who was spending her way through the last of several fortunes. She eventually moved on to Florida and I read in the *New York Times* how she got evicted from her apartment down there for not paying rent. Really sad.

I used to walk to the Kennecott office, which was down on 42nd Street, immersed myself in literature on the copper deposits of the world, and came up nine months later with this [showing *Copper Mines of the World*].

Swent: Oh, my goodness! *The Copper Mines of the World*! Three inches thick!

Joklik: I worked on this seven days a week. There were people who wanted to help me take short cuts. I said no because I wanted to produce

something that would stand up in court. Also, I was getting educated on the distribution of copper throughout the world.

Swent: Absolutely. Now this was all the mines that were operating at that moment?

Joklik: That's right.

Swent: That you could find out about. I suppose ones in Russia or China, you couldn't.

Joklik: I included Russia and China.

Swent: Did you even get information on them?

Joklik: Yes. You know, I used to go to Washington and hang around the Bureau of Mines. Also, the Engineering Societies Library in New York. I worked at it twelve to fourteen hours a day and covered the waterfront. I met with Mr. Cox and he was complimentary, which was surprising.

Swent: So, you were covering operations and economics and the whole ball of wax.

Joklik: Yes. The geology, the scale of operations, the mining method, beneficiation, where the material was smelted and refined, the markets, capital and operating costs--all the cost information I could get. I was aggressive about acquiring cost information, because I wanted to show where Kennecott stood in relation to the competition. It turned out that U. S. producers, by and large, were above the world average; this gave us food for thought.

The company that controlled the biggest chunk of world reserves was Anaconda. Kennecott, Union Minière, Anglo-American and AS&R each had about 10 percent. Five companies controlled nearly 60 percent of the world's copper ore reserves. Africa was still a major factor in copper production. Northern Rhodesia and the Belgian Congo produced almost 30 percent of the free world total. Stratigraphically controlled or "bedded" copper deposits, principally in northern Rhodesia, accounted for over 30 percent of the free world's reserves. Since then, as you know, porphyry copper deposits have yielded the bulk of new production and additions to reserves.

Swent: You must have had a deadline for this, also. The FTC hearings were coming up.

Joklik: I'll say! I finished in June of 1960.



Swent: And there were hearings scheduled?

Joklik: Yes. I forget what the dates were, but they immediately went to trial.

That assignment ultimately led to my marriage. When I was still based in Québec, I used to see a lot of Dr. I. W. Jones, the head of the Geological Survey of Québec. He was a charming man, a geologist of the old school. He and I used to have lunch together every few weeks.

His daughter, Anne, studied at the University of Toronto. In March, 1959 I went to the annual Prospectors' and Developers' Convention in Toronto. I suggested to Anne that she come and bring some of her friends to the closing banquet and dance. One of her friends was Michéle Demongeot, cousin of the French film actress Miléne Demongeot. Michéle was also studying at the University of Toronto. Her parents lived in Stamford, Connecticut, and when she graduated from the University of Toronto, she came to Stamford and joined Pan Am.

To do all the typing and collation of the copper study I needed help. Michéle said some of her Pam Am friends would come to the rescue, and they did.

#### Harvard Business School; PMD ONE

Joklik: I spent the summer back in Canada lending a hand with a few drilling projects in country I knew, mainly in New Brunswick. Then, in the fall of 1960, Kennecott, on Jim Boyd's recommendation, sent me to the Harvard Business School for the Program of Management Development, otherwise called PMD One.

Swent: Was this the first one they did?

Joklik: Yes. It was a five-month program and ran from August to December. It was intended for people twenty-eight to thirty-five years old who'd had a minimum of five years' business experience. According to the prospectus, the objectives were to develop an interfunctional point of view, to gain knowledge of quantitative analysis and organizational behavior, and to further analytical skills and judgment.

There were seventy-nine of us in the class. We were divided into room groups. My room group consisted of four; the other two were Bob Innes who came from Westinghouse Electric, and Earl

Harbison who was with the CIA. Earl later became president of Monsanto Chemical. Oh, and there was Dave Parmelee, who was with Henredon Furniture. You know Henredon in North Carolina?

Swent: Yes.

Joklik: The work consisted mostly of case studies, which was a new experience and very stimulating.

Swent: These have been enormously successful, haven't they?

Joklik: Yes.

Swent: And the other people you met were undoubtedly part of the education.

Joklik: Yes, I kept in touch with some.

Meanwhile, on a quick trip to New York I had tried calling one of my Pam Am helpers when I knew she would be out of town. Not surprisingly, her new roommate, Pam Fenton, answered the phone. I said, "Is Chris out of town?" Pam answered, "Yes, unfortunately she is." I said, "Well, that's terrible. I've got two tickets to the Yankees-Dodgers game going to waste; by any chance, would you like to come?" She hesitated, but being Scottish, the idea of anything going to waste upset her. That was our first date.

Swent: The rest is history?

Joklik: Yes. She wore her yellow dress to the Yankees-Dodgers game. Both Mickey Mantle and Roger Maris dutifully hit home runs that night. And I bought her a hot dog; which was our first meal. We then went to dance at the Sheraton East night club.

Swent: The yellow dress was significant?

Joklik: Oh, it's just that I remembered it.

Towards the end of my stay at Harvard, I persuaded Pam to come up for a weekend. We had classes on a Saturday morning. I brought Pam along and sat in the back row to be inconspicuous. It was the Swissair case, and I could see Professor Ed Wrapp surveying the class for a victim. He stood there like this [demonstrating], with his arms akimbo, and said, "Frank, perhaps you'd be good enough to open the case discussion." Of course, with Pam having just come up the day before, I had merely glanced at the case write-up. I had to ad lib, which was obvious to everyone, I suppose.

Anyway, it was a worthwhile program. And when I returned to the Kennecott office, imbued with all this new knowledge, I felt it was high time that Frank Milliken, who by then had taken over as president from Charles Cox, move aside and let me sit in his chair. After all, I had learned all those management skills. Frank didn't have any intention of moving over, [laughter] and eventually I left Kennecott.

That was about the time when Jim Boyd asked me whether I'd like to come to Copper Range.

Swent: I was wondering when he left. I don't remember, exactly.

Joklik: He left in March of 1960 to become Chairman of Copper Range.

Swent: I think you were at Harvard then?

Joklik: I went to Harvard in the fall of 1960. Jim, who had been responsible for sending me to Harvard suggested that I join him at Copper Range. After three weeks of agonizing, I turned him down. Part of the reason was that I was then thirty-two years old and thought it was time to settle down. I'd met Pam and was much impressed; I thought that to just leave New York and head up into the wilds of Michigan might not be the smartest thing to do. Jim understood.

#### Seventh Commonwealth Mining Congress in Southern Africa

Joklik: Harry Burgess succeeded Jim Boyd. He was a cultured man and excellent geologist. He later took early retirement and died relatively young. Harry thought I should go on the Seventh Commonwealth Mining Congress in Southern Africa. So I signed up.

I had thought that my relationship with Pam would progress more quickly than it did. In anticipation, I signed up "Dr. and Mrs. Joklik." When the time came, Pam and I were still getting to know each other; with all her traveling and mine, we just didn't get to see much of each other. I went on this congress alone and some of the kindly mining industry matrons I met said to me, "Oh, couldn't Mrs. Joklik come with you on this trip? What a shame she couldn't." And then, coyly, "Is she expecting?"

That was one of the last great, international mining conferences hosted in Southern Africa, before the country became ostracized on account of apartheid. The might of the industry

centered in Johannesburg was impressive. Here was a major city that functioned as a mining town, run by mining people.

Swent: And this was when?

Joklik: I took a Pan Am flight over to London in April '61 and made sure it was one on which Pam was Purser. I must have got her confused because in her announcement she welcomed the passengers on a "Boeing 7C." It was actually a DC7. There was a captain dead-heading, sitting across from me. He motioned her over and had a little chat with her. [laughter]

I flew on to Johannesburg. First I visited West Driefontein on the Rand; then on to the Orange Free State where we inspected the Loraine Mine. Next came Tsumeb and Etosha Pan, the huge game reserve in northern Namibia which was famed because of the sheer numbers in the herds of animals. The whole horizon moves. Unbelievable, the variety and quantity of wildlife.

Swent: That must have been a real thrill.

Joklik: It was. They treated us to a lion party; you know, where they go out at night and find a pride of lions devouring a wildebeest.

Then I went on to the iron and manganese deposits of Sishen; there was this little airport with "Hotazel" in huge letters. Of course, it was hot as hell! The Congress went on to the Kimberley diamond mines, to Messina in the Transvaal and through the Kruger Park. Then we entered Rhodesia and visited N'kana, Chibuluma, N'changa and Bancroft.

I met Sir Arnold Prain, the god-father of the Rhodesian mining industry and the head of Rhodesian Selection Trust.

Wherever we went, we'd have open-air dinners and brafleis parties. The weather was ideal. There would be a brass band of black musicians in military uniforms, expertly playing Strauss waltzes and tunes from current musicals.

Swent: The last vestiges of Empire?

Joklik: Yes. And this was at Bancroft. Six miles across the border hell was already breaking loose in the Belgian Congo. Sir Roy Welensky, president of the Federation of the Rhodesias and Nyasaland came to a dinner and held a fiery speech about the wonderful future of the federation.

We went on to Victoria Falls which, as you know, dwarfs Niagara Falls. What impressed me and, when I recently went back

with Pam, thirty years later, what impressed us was the absence of warnings or guardrails. If you wanted to peek and take a step too far--

Swent: Away you went. [laughter]

Joklik: We saw the Kariba Dam which had just been completed on the Zambesi River. I finally did a side trip to O'okiep in northern Cape Province.

I came back through Europe; Pam had sent me a note saying "I bought a Grundig stereo in Frankfurt. I'm over my customs allowance. Please be so kind as to bring it back with you." All right, a Grundig someplace in Frankfurt. I went to the phone book, made myself a list of about twenty radio and appliance stores and started at the beginning.

Swent: She didn't tell you where it was!

Joklik: No. And I had no way of getting in touch with her because she was on a trip. I asked at each store whether by any chance a young lady with an English accent and a Pan Am uniform had come in and bought a Grundig. In the fifth store, Diehl Radio, a young salesman said, "Oh, yes. I remember. Did she have dark hair?" I said, "Yes." "And her name was Fenton?" "Sure." So I brought it back with me on my customs allowance and gained some brownie points.

My position at that time, was assistant to the vice president, exploration, Harry Burgess. Harry thought that part of my function should be to gather intelligence in various parts of the world. He wanted me to go back to Australia and update what was going on there.

So, in August of '61, after an absence of six years from Australia, I headed back there--this time by plane, not by boat.

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Swent: Bob Menzies was still in power.

Joklik: Yes, though with a slim majority. I toured Mt. Isa again and visited Weipa for the first time, where CRA had opened up a major bauxite mine.

The evening I was there I had a few drinks with the boys in the bar and then one of them said, "Why don't you come croc shooting?" It was a hot, windy night. We jumped in a punt, pushed off and reconnoitered the mangrove swamps. We each had a



.303 rifle. All you see is a pair of orange coals, suddenly burning in the water. You know you have to hit between them. If you just wound them, they go for the boat with their tails. We saw several, but didn't get close enough to risk a shot.

I went to Broken Hill, which I'd known from before and spent a few nights at various prospects. After the long absence from Australia and my years in the Canadian bush, it was interesting to compare the two. You know, in Canada at night, the bush is alive. It's never quiet. You always have rustling of trees. You hear night birds. Insects crawl around, porcupines scrape against your tent.

In Australia under the stars, in the semi-desert, [hushed voice] there's absolute quiet. Not a sound. Totally different kind of a feeling.

Swent: Had you been out into Western Australia at all?

Joklik: I knew the Northern Territory like the back of my hand. I knew New South Wales and Queensland but I didn't know Western Australia, except for that bit on the Lasseter Expedition.

Swent: Western Australia was beginning to really boom by then, wasn't it?

Joklik: That wasn't long afterwards, and we'll talk about it.

Swent: All right.

#### Harvesting Manganese Nodules

Joklik: My next assignment was the manganese nodule project. In June of 1962, Kennecott contracted with John Mero to dredge a hundred tons of nodules from the floor of the Pacific Ocean. Nodules were advertised as the next major source of mineral raw materials, after we ran out of resources on terra firma.

Swent: The moon and the ocean were the two big places we were looking.

Joklik: Exactly.

Swent: American know-how?

Joklik: Perhaps more of a sense of direction than is evident today.

Swent: Science was going to solve everything.

Joklik: I went out to Long Beach and rented a former U. S. Navy net-laying vessel built in 1944; a 290-ton ship, steel hulled. We assembled the equipment and put to sea. We sailed south from Long Beach, along the shore of Baja, to a location 300 miles southwest of Cabo San Lucas, where there had been reports of nickel and copper-bearing manganese nodules. We relied on celestial navigation, which was accurate to within one mile.

Swent: Well, there was radar, but not on a boat that small?

Joklik: Oh, sure, we had radar. Once you were away from shore, it didn't help with navigation.

Joklik: Our equipment consisted of a fifty-horsepower motor that powered a winch and a drum on which was wound 16,000 feet of 9/16- and 5/8-inch-diameter cable. The cable went over a sheave on an A-frame on the stern of the ship. Dredging was by means of a rectangular bucket constructed of a steel frame and covered with expanded metal. The bucket was 8' x 3' x 11'.

The most critical item of instrumentation was a strain gauge mounted on the sheave. Clearly, if the bucket got hooked up on some obstruction, you'd want to let out some more cable and reverse engines. We took four-hour watches around the clock. On one of my watches, my eyes shut a little and when they opened, the reading on the strain gauge was off scale. I gave the signal to reverse engines, but it was too late. Suddenly, the reading on the strain gauge went down to zero. Fortunately, it wasn't due to a break in the cable. The bucket had caught on a pinnacle and broken loose. A length of cable got balled up and had to be cut out. It could have been worse; we could have lost the bucket!

Swent: Yes! Oh, dear!

Joklik: Anyway, the skipper was an old, experienced salvage man. He and I got on famously. We had long evenings yarning on the bridge.

Swent: How did you locate what you wanted to pull up in these buckets?

Joklik: There had been reports from previous sampling by others.

Swent: Okay.

Joklik: We had a submersible camera which didn't work worth a damn.

These manganese nodules, Lee, are like cupcakes: about 3" diameter, average. They're concentric layers of metal oxides; at the core is a bit of shark's tooth, or similar material. We found that the nodules occur as a single layer on the red clay which

forms the ocean floor. You can dig down but you won't find any more. It must have been a peculiar combination of chemical and physical conditions that caused the precipitation of oxides forming these manganese nodules.

Swent: So, the hope was that you could scoop up this enormous mineralization?

Joklik: Yes; and to determine whether it could be mined and processed economically. The nodules assayed about 1.4 percent nickel, 1.2 percent copper, .25 percent cobalt, and 27 percent manganese. After we'd done the processing tests, our calculations showed that you'd need metal prices about 50 percent higher than prevailed at that time to give a 15 percent return on investment.

The bucket design was by no means ideal. We nearly killed a couple of people. The man who was operating the winch somehow lost control and put a huge strain on the cable hauling in the crown of the bucket. There was a safety link just above the bucket harness. The link snapped and the bucket, which was stabilized by a system of wire ropes attached to nubbins and tugger motors, smacked onto the deck. The two guys whose job it was to attach the wire ropes had been standing there a second before. For some reason--perhaps premonition--they had stepped aside. They would have been flattened.

Another hazard was that, after the first few days, we attracted a school of whitehead sharks. They were so hungry that if you tossed a grapefruit peel into the water, they'd fight over it. With our primitive dredging equipment, there was constant danger of someone falling in the water. They'd have been gone like that [snapping fingers].

On one occasion, we launched our small lifeboat because we wanted to take pictures of the operation at sea. We had only about six feet of freeboard. The sharks were around the boat so close you could stroke their fins.

Swent: Had you wanted to.

Joklik: They were ravenous. One guy wanted to stand up to take a picture. We nearly threw him overboard.

In the end, we collected ten tons of nodules in twenty-one hauls over five days. Considering the conditions, we were satisfied.

We packed the nodules in gunny sacks and sent them to the Kennecott Research Lab here in Salt Lake City where they tested

the Cuprion process, based on leaching with ammonia. They obtained good recoveries of copper, nickel and cobalt.

After I'd written my report on the expedition, I laid out a grid over the portion of the Pacific Ocean that appeared to be prospective for nodules. The grid just happened to be centered on Bora Bora. The idea was that G. F. Joklik, the following year, would go out and undertake a program of sampling. Fortunately for my character development, it didn't happen because not long afterwards, I left Kennecott to join Amax.

Kennecott did pursue this project and formed a consortium that included RTZ, Consolidated Gold Fields, Mitsubishi, Noranda and BP. They identified a mine site southeast of Hawaii and did a lot of sampling, metallurgical test work and conceptual engineering.

What eventually killed the project? I suppose the economics continued to look marginal. More importantly, the manner in which any potential profits would be dealt with under the Law of the Sea treaty apparently ensured that no income-dependent organization could successfully invest in an ocean mining venture.

Swent: So, your decision--you just didn't think it was a good career move to go out to Bora Bora, was that it?

#### Successful Pursuit of Pamela

Joklik: By the time I came back from that trip, I said to myself it's time to get serious about life. The previous Christmas Eve, Pam and I were at a party at John and Joan Sullivan's house in Toronto. Well after midnight, I judged her to be in a sufficiently mellow state to accept a ring for which I'd acquired a flawless, blue-white diamond in Johannesburg; and so we got engaged. Almost a year later, after I came back from my sea-faring, on the 22nd of December, 1962, we got married in St. Xavier's Church, Broadway, in the Cotswolds.

Swent: This was Pam's home.

Joklik: Well, her home was in Birmingham, and this little church in the Cotswolds appealed to her since it was close to a couple of beautiful country places she knew well. We were married by good Father Angelo.

That evening, as we were driving away, there was thick fog on the road to London. Since we were running late to catch a plane, I took a risk and tried to overtake a truck. I was abreast of it when headlights appeared out of the fog, not more than thirty or forty yards away. I slammed on the brakes and just managed to squeeze in behind the truck. It was a close call. We reached Heathrow, had a libation and boarded the plane.

In Rome we checked in at the Hotel Eden and spent Christmas exploring the sights of the city. Pam knew the city better than I. We had a great time, including dinner at Alfredo's, where we were presented with the golden spoon.

We then had a couple of days in Vienna at the Imperial Hotel and went on to Lech in the Arlberg region. We arrived there in the evening. A heavy snowfall occurred during the night. We got up early and took the first cable car to the top of the mountain. There was snow everywhere, and the village of Lech was below us. The sun had just risen. I said to Pam, "Look, I have to get this picture, with you in the foreground." I was just about to press the shutter when I stubbed my foot.

I looked down and uncovered the top of a metal post. I realized this was the top of a railing on the edge of a cliff. Pam was way out in the snow.

Swent: On the overhang.

Joklik: Yes. So, I said to her, [very quiet voice] "Pam, move very slowly. Take one step towards me; another." Finally I reached out, grabbed her by the hand and yanked her in.

We walked around to see in cross section where she had been standing; she'd been a good fifteen feet out on a cornice, with a thousand foot drop below. Just then, the cable car arrived, with ski patrollers carrying bundles of stakes. They were aghast at where we'd been and marked off the cliff area. Another close call.

Swent: Yes!

Joklik: We returned to New York from this wonderful honeymoon and ski vacation. I was walking on Madison Avenue and ran into Roy Jure who was Exploration Manager for Amax [American Metals/Climax]. He suggested I join Amax and open an office for them in Australia. After some negotiation with John Payne--John was an Amax vice president--I said, "Well, why not."



I'd had a discussion with "Big Mike", C. D. Michaelson, who was vice president, operations for Kennecott. Mike said to me, "Why don't you get into operations?" He sent me to Ely, Nevada, and to Utah Copper, to interview. Industrial engineering was in vogue at that time, do you remember?

Swent: Yes.

Joklik: In both locations, they wanted to put me in the industrial engineering group. I thought about it, and consulted with my mentor, Jim Boyd; he said, "On the one hand, operations would be good experience; on the other, it sounds like a heck of an adventure in Australia." I think it was the "adventure" that got the best of me and I decided it was time to move on. So, I resigned from Kennecott and joined Amax as of the 1st of March 1963. I reported to John Payne. Did you ever run into John?

Swent: No, I didn't know him.

##

Swent: I'm curious about this. You mean to say you ran into somebody on the street and he offered you a job, just like that?

Joklik: Yes.

Swent: He must have been thinking about it. I'm not questioning what you said!



V AMAX--PROJECT MANAGER, VICE PRESIDENT, 1964-1973

Joklik: The Amax people were debating whether they should be in Australia. John Payne was a hard-driving, energetic man--an eternal optimist. He favored establishing a bridgehead in Australia. They needed someone who knew Australia. That's what they wanted me for.

Swent: It certainly was a natural for you, it seems.

Joklik: Yes. So, Pam and I packed up our goods and chattels in our apartment on East 49th Street in New York. We thought on the way to Australia we'd do a little sightseeing. It cost Amax nothing, because in her position with Pan Am, she was entitled to free tickets.

We left the apartment, got in a cab and headed out to Idlewild, as it was then called. We looked back, saw the silhouette of Manhattan and mentally said good-bye. The cab driver said, "Where to?" Pam said, "Sydney, Australia." The cabby said, "Sorry, I'll have to phone for out-of-town rates." [laughter]

We got to the airport, found the flight was full and couldn't get on as standbys. So we returned to the apartment, slept on the floor, and took off the next day. This time we were lucky and got away.

We flew via Europe and then had a short stay in Hong Kong. In those days, merchandise came in from China, but U.S. citizens weren't allowed to buy because of the poor relations between the U.S. and Communist China. There were all these wonderful things to buy for non-U.S. citizens, as we then were. The prices were ridiculously low. Pam has never been backward in shopping malls, and did some good work there. We went on to Japan, then to Hawaii, and finally arrived in Sydney at the end of April of 1963.

Australia: Twenty-Five Years of Change

Joklik: Lee, let me just comment on Australia in those days. While flying back from Kuwait the other day, I made notes on how Australia had changed by 1963, in comparison to the pre-war years.

Swent: Good. That's worthwhile.

Joklik: Australia before the Second World War, as I remember it, was a great place to live. Not that it isn't now; but it's changed since then. Or better put, Australia has evolved, in keeping with the times. As you've perhaps already sensed, much of me is Australian, because that's where I spent my formative years, and my professional career has kept me in close touch with Australia ever since.

Before the war, Australia was a place of strong characteristics and strong contradictions. On the one hand, it had the reputation of a man's world--of "bronzed Anzacs," of tough ex-servicemen, or "diggers", parading on Anzac Day; lean, muscular surf life-savers adorning the advertising posters for breweries; crowded men-only hotel bars with standing room only; lonely but self-sufficient jackeroos on the sheep and cattle stations in the Outback where women were scarce. Yet, when it was all said and done, the vast majority of Australians lived quietly in what was, even then, one of the most urbanized countries in the world. If you didn't live in Sydney, Melbourne, Adelaide, Brisbane or Perth, you were in the minority. And if you ever did go out and spend time living in and living off the "bush," you were the exception, rather than the rule. So the stereotypes commonly didn't hold up in real life.

Another contradiction was the love-hate relationship with Britain. Australians were, I would guess, 95 percent of English, Scottish, Irish or Welsh descent, which was a function of the country's origin as a British penal colony. The White Australia Policy barred immigration from Australia's neighbors. You would think, therefore, that most citizens of the commonwealth considered themselves to be loyal subjects of His Majesty King George VI, and this was certainly true when it came to the knighthoods and other honors conferred by His Majesty each New Year's Day. But the average Australian had a strong dislike of British newcomers and the term "pommy bastards" probably started more bar room fights than any other form of insult. This anti-British feeling had its roots both in long memories of the brutal penal system and the experience of the First World War when, in the perception of many, Australian troops at Gallipolli were needlessly sacrificed by callous British generals.

Finally, the Australian economy was sound, but bound to change. Six million people, clustered mostly in five cities, inhabited a country the size of the United States. The free use of this country for sheep and cattle grazing provided the underpinning of the economy. Britain was by far Australia's largest trading partner. Exports of beef, lamb and wool, almost all to Britain, more than paid for imports of manufactured products. Australia's own manufacturing industries were handicapped by the small domestic market and the low productivity of Australian workers who were, even then, known for their independent attitude and love of beer and "the races". Fortunately, Australia's vulnerability to weakness in pastoral and agricultural commodity prices was not a factor in those days of the British Commonwealth preferential trading system, which earned Australia the epithet of "the lucky country". The re-ordering of the world after the war changed much of that.

But first came the war itself. Australians readily volunteered to "join up" and were sent around the world wherever British interests dictated. A big shock came with the rapid advances by the Japanese in the Pacific and the realization that even the Australian mainland was threatened and virtually defenseless. A second shock to Australians was that, apart from the heroism of the few Australian troops that could hurriedly be deployed in the country's defense, it was the Americans and not the British who saved the day in that crisis. As I remember, Americans had been popular in Australia before the war--American movies, American cars produced familiarity with the American way of life. But, by the time the last shot was fired in the Pacific, familiarity had deepened into gratitude which has lasted.

The economic, rather than political, dissolution of the British Empire after the war also changed Australia's international affiliations. The abandonment of Commonwealth trading preferences destroyed the price stability of Australia's principal exports and brought with it unemployment and higher taxes. It also left Australia scurrying for new markets for its products, but access to the obvious new market, Japan, was for some time blocked--not by the Japanese, but by the intense anti-Japanese feeling that had resulted from the suffering of Australian troops at the hands of their Japanese captors during the war.

To lessen the country's vulnerability to the very real reductions in the wool cheque and other revenues from primary commodities that were no longer protected by Commonwealth preferences, Australia then attempted to beef up the manufacturing sector. Foreign investment in production facilities was encouraged, partly by providing tariff protection for the



products. The failure of this strategy soon became evident. For example, four or five Australian branches of American and Japanese automobile companies found themselves competing behind tariff walls for Australian market share with high-priced, poor quality Australian-made or assembled cars.

What bailed out the Australian economy, as the artificially stimulated manufacturing sector staggered along, was, I blush to say, a surge of mineral exploration and development that began in the 1960s and has continued until today. The stimulus came from softening Australian attitudes towards the Japanese and the simultaneous encouragement by the Japanese government, through MITI [Ministry of International Trade and Industry], of Australian interest in satisfying the hunger of Japan's growing manufacturing industry for mined raw materials. Iron ore, bauxite/alumina and coal led the way. Nickel, the base metals and gold followed in "the rush that never ended". When I returned to Australia in 1963, wide-eyed and bushy-tailed, with my newly acquired wife, Pam, I was fortunate to arrive at the beginning of Australia's minerals boom and to participate in one of its most exciting phases.

Already by 1963, the character of Sydney had begun to change from its pre-war and war-time makeup. In its efforts to boost the manufacturing sector, the government had adopted a policy of encouraging the immigration of skilled workers from a range of European countries. The White Australia Policy was scrapped in deference to the country's newly found Asian trading partners. Sydney, as a result, began to change from a provincial colonial town to a cosmopolitan city of international importance. Restaurants with all kinds of ethnic cuisines supplemented the traditional, bland English fare. Australia's wine industry finally came into its own. The merits of Australian art, music and theater began to be recognized internationally. What impressed me most was the striking way the face of Sydney was changing.

### Sydney: Still the Most Beautiful

Joklik: Sydney is built on Hawkesbury River sandstone which provides solid foundations and doubles as an excellent building stone because it weathers to an attractive reddish-brown. Most of the pre-war public buildings were built of this stone and were preserved as redevelopment spread from the waterfront at Circular Quay. The new office and apartment buildings were well designed and set so as to allow room for landscaping and park areas. I don't know

whether it's a function of civic pride, higher taxes or a longer-range perspective, but in terms of city planning, as exemplified by Sydney, Australia seems to me to be ahead of its friends in other industrialized nations. Of course, this city has a whopping head start, by virtue of its harbor, in qualifying for the title of most beautiful in the world.

Now, ironically, when Pam and I reached Australia in 1963, we didn't initially go to Sydney. We went to Melbourne, because the first assignment was to examine a company named Aberfoyle Holdings, whose main assets were tin mines in Tasmania. I teamed up with John Howbert and Ted Schassberger from Amax's mining group out of New York. I'd said to them, "Look, we're going to Australia. That's a country with a warm climate and we can dress lightly."

Swent: Shorts.

Joklik: That's how I remembered it. It was the beginning of May. In Tasmania it was bitterly cold! We were wearing three dress shirts [laughter], one on top of the other, because we didn't have much else. We nearly froze to death before we went underground at the Aberfoyle and Storey's Creek Mines. John and Ted thought I was a poor tour guide, and reminded me of it more than once.

We also visited the Greenbushes tantalite mine in Western Australia and the Ardlethan tin field in New South Wales. The three of us concluded that Aberfoyle Holdings was not a suitable vehicle for Amax's first investment in Australia. The news of our conclusion was unpopular with several managers back in New York. They said to Ken Craig, the chairman of Aberfoyle, "The technical people have had their say. Now, let's get on with making a deal based on the economics."

We said, "Wait for us, Leaders. We think we know something about economics, as well as technology. Don't do the deal."

It took several months to bring this debate to a head. The painful part of it was that we thought the Aberfoyle team consisted of good people and we disliked putting them through the hoops without prospect of a fruitful outcome. We were afraid news of our negative report would give Aberfoyle Holdings a black eye with the stockholders.

In New York, Amax's Vice Chairman Elmer Funkhouser wasn't prepared to let go, and we were caught in the middle. John Payne was backing us. In the end, we won what appeared to be a Pyrrhic victory. I should add that Funkhouser was an excellent man and we subsequently became good friends.

Swent: So, you were given the responsibility of analyzing this and recommending whether or not Amax should buy it.

Joklik: At first blush, Aberfoyle had looked like a good, small enterprise to serve as a foothold in Australia. The company that, eventually, did buy into Aberfoyle was Cominco. They stayed in there for some years, but ultimately sold out.

You know, rivalry between Sydney and Melbourne is proverbial. Melbourne was known as a financial center, a more serious city than Sydney with its laid-back lifestyle. Pam and I couldn't quite warm to the idea of living in Melbourne and persuaded John Payne that we should set up shop in Sydney.

After a brief search, I found excellent office space in the ICI Building overlooking Circular Quay and Sydney Harbor. We rented an apartment at Darling Point, one of the most attractive suburbs on the shoreline, only a few miles from the city. I scrambled to round up lawyers, accountants and bank accounts to establish our presence in Sydney; these were exciting times.

By June we were pretty well set up. John Payne and Andy Chandler came to visit us. Andy Chandler was Amax's General Counsel. He was a man I had tremendous regard for, a brilliant lawyer. The agreements we subsequently negotiated for, the Mt. Newman and Kimberley projects, became models world-wide for the development of major mineral resources by international consortia in regions where no infrastructure existed. They were largely the work of Andy Chandler.

Swent: This is sort of the beginning of big international, multinational development.

Joklik: Yes. Chandler wrote his agreements to last for twenty-five years and longer. He had the ability of projecting the present into the future and surmising what kind of safeguards and provisions might be relevant far ahead. He was no nitpicker and focused on broad issues.

Swent: Amax was kind of a new company at that time.

Joklik: Amax was still healing from the bloodshed that resulted from the merger between the old American Metal Company and Climax Molybdenum. When I first joined I didn't realize the extent of the infighting that was still going on. I came to understand only months later just how tough the struggle had been to form a cohesive company.

Scouting by Ian MacGregor

Joklik: One of our first tasks was to follow up on a previous trip by Ian MacGregor.

Swent: He was the chairman?

Joklik: No. At that time he was a junior vice president of Amax, in charge of business development. On an idle afternoon in Sydney, Ian had visited the state Department of Industrial Development, sought out the man in charge and said, "Hi, I'm from Amax, New York. Anything new going on?"

This guy scratched his head and said, "Well, there's this friend of mine, Charlie Warman who, I believe, has some iron ore deposits in Western Australia."

Charlie Warman was the chairman of Warman Equipment, the company that makes slurry pumps and other mechanical equipment that's used all over the world and was invented and designed by Charlie. Now he was running a growing company, but what he really wanted to do was continue inventing.

As a sideline, he had grubstaked a Western Australian prospector named Stan Hilditch. Stan had gone prospecting, initially, for manganese. In due course, he came across iron ore occurrences in the Pilbara region of Western Australia. Payne, Chandler and I met with Stan Hilditch and Charlie Warman and discussed the possibility of joint venturing the Mt. Newman iron ore deposits that Stan had discovered.

Swent: You hadn't seen it yet. You hadn't gone out there.

Setting up Office and Entertaining

Joklik: No. I hadn't even hired a secretary for my office. In the short time we'd spent in Melbourne, Pam had taken a secretarial course. She did the typing for me. Across the corridor from my office was Continental Oil, run by Bud Abbott, from Texas. Bud saw me in the elevator one morning and said, "Frank there's something I need to tell you." He said, "This may be embarrassing to you, but your secretary is noticeably pregnant." [laughter] He hadn't realized we were married. Pam continued for some months until I hired a secretary who happened to have been Sir Harold Raggatt's assistant in Canberra, before he retired. Isobel Winkelman was a great

help. Those days in Sydney, with what we had on our plate, generated adrenalin in abundance.

I mentioned how Isobel Winkelman took over from Pam. Let me take a short break and tell you a little about Pam's background. She was born in Edinburgh, Scotland. When she was still a little girl, her family moved to Birmingham, England. That's where she went to high school, and then on to university. She was interested in sports and was on the English Universities' netball team.

Swent: What is netball?

Joklik: It's the English form of basketball.

Swent: Basketball, okay.

Joklik: She was a leader in whatever she did. I quickly recognized this drive of hers. She applied for a job with Pan Am when there were hundreds of applicants; she was one of a few selected. She worked for Pan Am, first as a stewardess, and then as a purser, for three years. When I first met her in New York, she was flying all over the world; with my travels, I was also covering the globe. We had chance encounters in the strangest places.

After we got married, she kept flying for a few months but resigned when we arrived in Australia. In Sydney she had her first experience as a homemaker. She was immediately inundated with business visitors from the United States and Europe. We found ourselves entertaining at home almost weekly.

#### Manager, Mt. Newman Iron Ore Project

Joklik: John Payne and Andy Chandler came to dinner. The following day, I met Stan Hilditch for the first time. He was Charlie Warman's partner; the prospector who found Mt. Newman. Stan and I became good friends and continued to be so until his death in 1992.

#### **Stan Hilditch, Man for all Seasons**

Joklik: Stan was a man with a lean, hard body and a face full of character. Sometimes when I saw him standing in the field, he had about him the air of Don Quixote. As, I think, sometimes happens



with people who spend a lot of time in the Outback of Australia, his light blue eyes seemed to see way beyond the horizon.

Like me, he was a dedicated morning person. I remember sometimes getting up early at the Mt. Newman camp to start preparations for the day's work. Stan would always beat me to it. He'd already be there by the stove and have a pot of tea ready; he'd greet me brightly with the observation, "best part of the day."

During his prospecting years, he was accompanied everywhere by his wife, Ella, who was a hardy and a kindly person. Stan's background was varied. He had, at various times, worked as a prospector, gold miner, innkeeper and farmer. At one stage, he ran cattle trains. I'm talking about road trains. These were articulated trucks, towing three or four trailers in tandem. They'd cover thousands of miles in the Outback, bringing cattle from the range to market.

Stan was a man of many parts. I don't think he had much formal education. He not only was interesting; he was also a very interested person. He had picked up much knowledge in the course of his varied life, and was always a stimulating conversation partner.

When we had the Mt. Newman project under way, in the evenings after dinner, he and I would go on long walks through the desert along the road leading to our camp--sometimes three or four hours--just talking about what was going on, what the future held. We'd range over many subjects.

Stan did well, financially, from the deal we negotiated with him and Charles Warman. Most of his reward was in the form of future royalties. He eventually took the present value of these royalties and invested that money in a cattle ranch on the plateau of the Great Dividing Range, about 200 miles north-northwest of Sydney. He developed a stud farm which became a model for Australia, specializing in Charolais and Simmental cattle. This was his avocation. He worked hard until he was well into his eighties and made a success of it.

Between periods of working on his ranch, he and Ella would undertake world trips. I believe he was in Russia and in China half a dozen times. I thought I knew the globe reasonably well, but by the time he died, he certainly knew it better than I did.

Swent: What was Mt. Newman? Was there a town there? A city?

Joklik: No, there was nothing there except an abandoned station homestead. Let me give you a little background. Until the Second World War, Australia was relatively unexplored for mineral resources. Australia had, and still has, only one steel company, BHP. One might call it a monopoly.

Swent: BHP.

Joklik: Broken Hill Proprietary Ltd.

Swent: Oh, okay. Right.

Joklik: The source of ore for BHP's blast furnaces were the Middle Back Range in South Australia and the Coolan Island deposits off the coast of Western Australia, both with limited remaining ore reserves.

### "Pig Iron Bob" ##

Joklik: During and after the Second World War, Australia placed an embargo on exports of iron ore. When Japan came into the war, Bob Menzies was prime minister, and he allowed exports of pig iron to continue for a short time. The unions called him "Pig Iron Bob." Of course, he quickly stopped further exports. At the same time, the government became sensitive to the limited nature of iron ore reserves in Australia.

When Stan Hilditch first came into the Pilbara region, which includes the Hamersley Ranges, he was exploring for manganese ore. There didn't seem to be any point in exploring for iron ore, when exports were prohibited. He found only limited quantities of manganese, but discovered outcrops of high-grade iron ore on a hill he called Mt. Whaleback. Mt. Newman was the name of the nearby abandoned station homestead we occupied as our base camp. Stan made his discovery in 1957, but couldn't acquire title because of the embargo on granting exploration licenses, or "Temporary Reserves," for iron ore. The embargo wasn't lifted until 1960. He and Charlie Warman then applied for and were granted Temporary Reserves over the Mt. Newman and other iron ore deposits.

They then looked for possible partners in the development of the iron ore deposits. They went to Japan, because there wasn't any interest in Australia, and made a deal with a small Japanese enterprise called Rasa Trading Company.

Swent: 1960, and they were able to sell to Japan then.

Joklik: Not yet. When Ian MacGregor, as I related before, made contact with Charlie Warman late in 1962, we recognized that the deal with Rasa Trading Company would have to be undone for Amax to negotiate an agreement with Warman and Hilditch. This became our first--

Swent: They couldn't just take over the arrangement with Rasa? Amax?

Joklik: Well, it takes two to tango. Rasa had to be willing to bow out.

Swent: Okay.

### Iron Ore Demand of Japanese Steel Industry

Joklik: Now, let me comment on the involvement of the Japanese so early in this process. As I think I've indicated before, ever since the end of the Second World War, Australia's ties with Britain had started to loosen as the realization dawned on Australians that, for its primary exports such as wool, wheat and minerals, Japan would be their trading partner of the future. Japan had traditionally relied for its iron ore imports on the Philippines, India, Peru and Malaya. These were relatively small and not very reliable suppliers. On the other hand, the Japanese steel industry didn't amount to much, either, after the war. As late as 1955, Japan imported only 5½ million tons of iron ore. By 1963, imports had increased to 31 million tons. The projections for the future were exponential. The Japanese were hyping the potential rate of growth, perhaps to foster international competition. At any rate, the discoveries in the Hamersley Range came at a very opportune time. The supplies from the Philippines, India, and Peru were declining. Before the great discoveries in Brazil could come on stream, there was a void to be filled, especially in light of the extravagant projections of increased demand by Japanese steel producers.

We quickly bought out Rasa's interest in Mt. Newman.

Swent: Were you competing with other people in this?

Joklik: Well, yes.

Swent: I mean, Amax was new on the scene in Australia.

### Competitors: Hamersley Iron and Mt. Goldsworthy

Joklik: That's a good question. There were two competitors. CRA and Kaiser had formed a joint venture named Hamersley Iron which was developing the Mt. Tom Price iron ore deposits. A prospector named Lang Hancock didn't discover Mt. Tom Price, but had acquired title to it and made the deal with CRA.

The other competitor was Mt. Goldsworthy, which was a consortium of Consolidated Goldfields, Cyprus Mines and Utah Construction.<sup>1</sup>

The Mt. Goldsworthy iron ore deposits were not in the Hamersley Range. They were about sixty or seventy miles southeast of Port Hedland. They were smaller than Mt. Tom Price and Mt. Newman, but the Mt. Goldsworthy consortium competed with us both vis à vis the Western Australian government and in the iron ore markets.

Swent: Were Warman and Hildich being pursued by other people?

Joklik: No. The size of Hilditch's discovery hadn't been demonstrated. Our deal with Warman and Hilditch involved some up-front payments. The main consideration was future royalties at various levels of iron ore exports. Our agreement with Warman and Hilditch was concluded in August of 1963. We were starting from scratch, and we figured we were six to twelve months behind Hamersley Iron and Mt. Goldsworthy.

My first trip to Mt. Newman was on the 21st of August. We flew 600 miles north from Perth in a single-engine Cessna. I'd made arrangements with Stan, that he'd burn a couple of old tires to give us an idea of where to land. There was a dirt strip, a few hundred yards long. It was a hot day with strong winds. Stan, recognizing it had been a bumpy ride, made a point of looking me closely in the face as he shook hands to see whether I was green around the gills [chuckles].

Swent: So you had just taken their word for it on this deposit.

Joklik: Nothing was known about it.

Swent: Okay.

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<sup>1</sup>Alexander M. Wilson, oral history in process, Regional Oral History Office, University of California, Berkeley, 1997.

Joklik: Stan and I hopped in his truck and had a cup of tea at the abandoned Mt. Newman station homestead. We then took a ride around Mt. Whaleback. Stan says his first recollection of me was that, as we rode around Mt. Whaleback, we came on a tree that had fallen across the track. With my Canadian experience, I reached for an axe, hopped from the truck, chopped the fallen log in two and cleared it away. Stan couldn't get over that; he thought, "Here's the big company representative from New York, who knows how to use an axe and isn't afraid to get his hands dirty."

### Crash Drilling Program

Joklik: There wasn't a single drill hole in this iron ore deposit. The first task was to mobilize drills and start exploration. The Brockman Iron Formation, in which the iron ore deposits occur, consists of Proterozoic jaspilite. The theory was that, due to surface weathering processes, enrichment had taken place, resulting in impressive outcrops of high-grade iron ore. These shallow deposits might be, say, fifty feet thick and, if extensive enough, amount to substantial tonnages of iron ore.

This theory of surface enrichment was applied to Mt. Tom Price, which was being drilled at that time. A few weeks after my first trip to Mt. Newman, I flew to Mt. Tom Price and met Lang Hancock and the CRA geologists led by Harold Jensen. They showed me over their project. We were due to return to camp at Mt. Newman that evening, but left too late. There was just the pilot and I. The distance was about 150 miles. We ran out of daylight. It got pitch dark and we weren't near Mt. Newman. Fortunately, once again, Stan Hilditch came to the rescue. He lit fires at the strip and parked his truck with the headlights on.

Swent: And these were similar deposits, then.

Joklik: This was all part of the Hamersley Range in which the Brockman Iron Formation contains deposits of iron ore.

We set about mobilizing drills. We weren't sure, at first, what was the best equipment to use. For near-surface probing, down to a depth of maybe 150 feet, we used Gardner Denver Airtrak drills. To probe deeper, we needed down-the-hole hammer percussion rigs. They were in short supply in Australia. We started off with Mayhew 1000 rigs and then switched to Reich 500 drills which performed well.



Within a few months, by the end of December 1963, we had seven rigs working on Mt. Whaleback, drilling out a grid of 750 feet by 250 feet and producing large quantities of cuttings that had to be processed, bagged and sent to Perth. We had contracted with an assay lab and caused them to expand their facilities. They handled the volume of samples we sent them and returned the results in timely fashion, enabling us to plan our exploration program.

### Ordinary People Performing Miracles

Swent: Did you have a manager out there?

Joklik: Yes. The first geologist I hired was Ken Malcolm. I knew Ken from before. He was a couple of years behind me at the University of Sydney, graduated with Honours, and had been active in exploration of bauxite deposits outside Australia in several tropical countries. He'd worked with Reynolds Metals, returned to Australia, settled in Perth, was looking for a job, and was ideally suited for this project.

Ken was a hard worker and a good explorationist. He ran the technical part of the program. We hired Stan Hilditch to run the Mt. Newman camp. Later, Ken headed up our Mitchell Plateau bauxite project. After that, he kind of got lost in the Australian minerals exploration boom and died young.

So, we had Ken Malcolm, and then I hired a bunch of other geologists. Notable among them was Bryan Summers, whose background was also in bauxite exploration. Ken actually referred him to us. Bryan was a big, bearded man, extremely intelligent, an unconventional thinker, and highly productive. He liked good food, drink, and music and was an excellent companion. He, like Ken, contributed notably to our exploration at Mt. Newman. Bryan also came to an early, untimely end. He bought himself a little farm outside Perth as a hobby. One day he was working with a chain saw up in a tree and managed to slice through the artery of his thigh. Before help could come, he bled to death.

Swent: Oh, my!

Joklik: And then we had Jack Zani, who came from the Kalgoorlie Gold Fields. I'd known Jack since my much earlier work at Cobar. He was working at the Wittenoom asbestos mine which was west of Mt. Newman and Tom Price. Jack was the chief geologist there--a

stable, knowledgeable man. He was a valuable addition to our crew.

Two other geologists were Jack Neale and Ray Martin. There's one other name I'm trying to remember. Yes, a young guy named Ron McMillan, who'd just arrived from Canada, walked into our Sydney office and said he wanted a job. He seemed bright and personable, and I immediately signed him up. Martin and McMillan were the ones who changed the geological thinking about Mt. Whaleback. This was important, and I'll come to that in a minute.

There was also a Yugoslav who was referred to me by Norm Fisher in Canberra: a most unusual character. His name was Mike Millisavljevich. He turned out to be an excellent detailed mapper. When we got down to mapping Mt. Whaleback on a scale of a hundred feet to the inch, he was invaluable. Unfortunately, he had commitments back in Yugoslavia. At the end 1964--he was with us only about eighteen or twenty-four months--he felt obliged to go back. I don't think he really knew what he'd face when he got back there. I lost track of him.

To round out our team, we hired a young English geologist, Peter Tetley. Peter was well trained and capable. His work was always of a high standard. A year or two after leaving Mt. Newman, he was driving west, became blinded by the setting sun, went over a cliff and died.

As you can see, the members of our crew had varied backgrounds, none of them exceptional. Yet, called upon to work as a team to meet our objectives, they performed miracles.

I've found throughout my career that, if you can give people the opportunity to work at their maximum potential and challenge them to produce results they never thought they'd be capable of, they rise to the occasion. But the opportunity, the incentive and the leadership have to be there. That's what we provided.

1963-1964 was an exciting time, when we started with a raw prospect and, in a matter of just over eighteen months, produced the basis for an offer to the Japanese steel industry that enabled us to catch up with our competitors, Hamersley Iron and Mt. Goldsworthy.

[Interview 3: January 20, 1994] ##

Joklik: I enjoyed leaping out of bed every morning, with the challenges of the day to face.

Towards the end of 1963, we were beginning to believe that we were onto something major. We'd carried out a reconnaissance of an area within a radius of 100 miles of Mt. Whaleback. This work was helicopter supported, but the flying conditions were difficult. High temperatures reduced the lifting capabilities of the helicopter and winds of fifty miles an hour were hazardous. Yet, we had to make sure we weren't missing any exploration bets. We identified important iron ore deposits in the Weeli-Wolli area which is northwest of Mt. Newman, and found other occurrences which were later drilled and evaluated.

The first proof that the traditional theory of surface enrichment might not hold water came early in 1964, when we acquired the capability to drill down several hundred feet with our rotary percussion rigs. We stayed in high-grade iron ore to a depth of 500 feet. It may seem strange we hadn't done this before, but the drilling was difficult. In the Brockman Iron Formation jaspilite, there were leached volumes that formed cavities. With the rotary percussion drill, you stopped getting air return and lost the hole. We now managed to stay in fairly massive material and test the mineralization to greater depths.

Swent: And is this diamond drilling?

Joklik: No, but we supplemented our percussion drills with a couple of diamond rigs. We used them more for stratigraphic control than for proving up tonnage, because percussion drilling was quicker than diamond drilling by a factor of, maybe, ten.

Swent: It's very expensive to do this drilling, isn't it?

Joklik: Yes. We were writing lots of checks.

Meanwhile, things were tough for Pam on the home front because I was traveling to the project site from Sydney once or twice a month. I was also looking at other exploration opportunities in Australia. In between, I was doing periodic trips back to New York. I was away from home 70 percent of the time.

Swent: Meanwhile, there was a new baby.

Joklik: A new baby arrived in January 1964. I remember bringing Pam home from hospital, with the baby all wrapped up. Little Carl was crying and at first we couldn't figure out why. Then we realized the temperature was close to a hundred degrees and he was developing a heat rash!

The assassination of Jack Kennedy had occurred two months before and caused consternation in Australia. Australians couldn't fathom why the president of a stable, civilized country like the United States should be murdered.

We were convinced that we had to make an offer to the Japanese by the middle of 1964 in order to remain competitive with Hamersley Iron and Mt. Goldsworthy. The Japanese were interested in ore that ran better than 63 percent iron and was low in sulfur and phosphorus; above all, they wanted lump ore. They were being offered fines from other locations in the world, but for their blast furnaces they wanted lump ore, plus 6mm minus 30 mm-- material that would not need sintering.

Early in 1964, we calculated our ore reserves. We figured we had 100 million tons of the required quality, but that wasn't enough to make an offer to the Japanese.

About that time, we started an adit in the eastern part of Mt. Whaleback. It became our showpiece, because not many feet from the portal, we ran into massive, blue-gray hematite, and stayed in it for 600 feet.

Swent: Where was the outcrop? What side of the mountain?

Joklik: On the south side.

Swent: The whole thing was an outcrop?

Joklik: Mt. Whaleback was about two miles long, half a mile wide, and rose to 800 feet above the plain level. You could find iron ore at most places on the surface, but you didn't know the size of the occurrence. We finally defined two separate deposits, one on Mt. Whaleback East, the other on the western portion of Mt. Whaleback. The adit went in several hundred feet above plain level on the south side of Mt. Whaleback East.

### Working with Sir Charles Court

Joklik: Not long after that, I invited Charles Court to inspect the project. He then was minister for Industrial Development. The premier of Western Australia was Sir David Brand, who came from a farming background. He was a kindly person, well liked and respected. But the man responsible for dealing with the iron ore companies was Charles Court, who became one of the best known politicians in Australia. He was a strong, handsome man, a hard-driving, hands-on individual, reputed to have a short fuse. It wasn't easy to get him on your side, but if you did, you had a formidable ally. When you got to his office, he'd always rise, shake hands and say, "What can I do for you?" It didn't take me long to realize that he expected a concise, to-the-point answer. Once you'd replied, he would take over and quickly tell you what he thought of your request or proposal.

We became allies and good friends over time. He was not to be trifled with, as I found when I first brought him to Mt. Whaleback. We went to inspect the adit. As we were leaving, I remained behind to talk to the contractors for a few minutes. When I got to the portal, Mr. Court was clearly angry at having been kept waiting. We hopped in the Land Rover and, as I accelerated and bounced down the rocky track to the base of the mountain, we had a heck of a row. Fortunately, by the time we got back to camp we'd cooled down. Holding a grudge wasn't his nature.

Our land title consisted only of Temporary Reserves over the discoveries. Once a minable ore reserve had been defined, it would be necessary to negotiate a development and operating agreement with the government of Western Australia. This would not be the case for, say, a gold mine in the Kalgoorlie area, where you staked claims and the rules for mining were defined in the Mining Act. But, for the development of major resources in remote areas, requiring the establishment of infrastructure facilities, a railroad and a port, project-specific agreements had to be negotiated with the government.

### Bringing CSR into the Mt. Newman Project

Joklik: I have to backtrack a little here to say that, as news of our successful exploration reached the upper echelons in New York, they began to think of the implications. The board of Amax was not uniformly in favor of spending a lot of money on developing



iron ore deposits half-way around the world in Western Australia. Walter and Harold Hochschild held strong sway on the board. They had been the leaders of the American Metal Company, prior to the merger with Climax Molybdenum. Frank Coolbaugh came from the Climax side.

Swent: And MacGregor?

Joklik: Also from Climax.

Swent: So this was a company that was still sort of feeling its way.

Joklik: Exactly.

Swent: A new marriage. And you were in the middle between--

Joklik: Well, I was reporting to John Payne who was not, really, one of the decision-makers. The decision makers were the Hochschilds, Coolbaugh and Gordon Reid who owned an independent oil company.

Swent: But, again, sometimes oil and metals are different.

Joklik: Gordon's specialty was finance. Harold Hochschild said it'd be crazy to put a lot of money into a business that depended on shipping routes that might be interdicted by Indonesia or other southeast Asian countries--

Swent: Well, what about Vietnam?

Joklik: You're right. Harold, from all accounts, said, "No way." What to do? I was in Australia with a 100 percent interest in what looked like becoming a major mine. Where was the financing to come from?

I became aware of concerns of the federal government in Canberra about foreign ownership of natural resources. I went through a list of possible Australian candidates for participation in the project and picked CSR, the Colonial Sugar Refining Company, which also happened to own the Wittenoom asbestos mine. That was their only involvement in mining. Their principal interests were the sugar industry of Queensland and Fiji and the building materials business, especially fiberboard. They were the major Australian supplier of these products.

One rainy morning in May 1964 I called Jim Vernon, later Sir James Vernon, who was the Chairman of CSR, asked for an interview and he said, "Sure, come on up." I trudged from my office on Circular Quay a few hundred yards up to the CSR Building, sat down with Jim Vernon and explained to him that we'd made an important discovery, that CSR already had a mining interest in the area, and

that participation in Mt. Newman by CSR was available. CSR was widely known as a staid, slow-moving company. Jim had two right-hand men, Don Brown and Gordon Jackson, both of whom later became managing directors of CSR. Don, a chemical engineer by background, was a brilliant but deliberate thinker. He certainly was capable of grasping the importance of my proposal. It was only a matter of weeks before they came back to me and said, "Yes, indeed," they'd like to participate. They committed to taking 45 percent of the project and New York gave their approval. Don and I then worked closely together in furthering the project and became firm friends.

Swent: Did you have to sell this to the board in New York?

Joklik: Yes. We now had the means of reducing the potential financial burden to something that might be manageable for Amax. Of course, at that stage there was no commitment to going ahead with development of Mt. Newman, but it seemed we had a reliable partner. Since CSR had a strong engineering group, they knew what they were getting into.

About that time, Pam and I celebrated our first wedding anniversary. I was working sixteen hours a day, seven days a week, and hadn't obtained a present. The day before, I phoned a florist and said I'd like to order some flowers to be delivered to our apartment. They said, "How much do you want to spend?" I said "Five pounds," which was, maybe, ten dollars. The morning of December 22, 1963, there was a knock at the door. Outside were two men with their arms filled with bunches of flowers. They said, "The rest of them are in the truck"! We filled the bathtub, plus the kitchen sink. There were lilies of various kinds, gladioli, snapdragons, and I forget the names of the others. Cut flowers were cheap in Sydney. [laughter]

#### Negotiating Mt. Newman Development Agreement

Joklik: When CSR, Charles Court and we thought the time was ripe to negotiate the development agreement with the Western Australian government, John Payne and Andy Chandler came over; Don Brown from CSR also was on the team. We sat in Court's office in Perth, and spent three days hammering out the heads of an agreement. And I mean hammer out, because there were strong views on both sides. At one stage Court maintained that we were being niggardly about the development of this bonanza; I pulled him up and said, "That's ludicrous to call this a bonanza." Well, that got him going. We

had [chuckling] a very interesting half hour before things calmed down again.

Swent: I'm not clear what the issues were. Was the government to get a return?

Joklik: We needed title before we could develop the iron ore. Title was going to be in the form of a twenty-year lease, renewable for a further twenty years.

Swent: Which you would pay for.

Joklik: There would be lease payments, which were not particularly onerous, and a royalty on exported ore. The royalty we negotiated was  $7\frac{1}{2}$  percent of the f.o.b. price. A commitment had to be made to future processing of the ore. Within ten years, we would have to build a plant for upgrading the fines by building either a sinter plant or a direct reduction plant; and within twenty years to build a steel plant for the export market.

Now, Hamersley had already negotiated an agreement of sorts and made commitments. It was impossible for us to back off, nor did we particularly want to, since merely an iron ore quarry without upgrading facilities was clearly unacceptable to the Western Australian government.

In return, we obtained secure title. The government provided us a right-of-way for the railroad, land for the port facilities and for other purposes. We had only a vague idea of what shape these support facilities would take. But we didn't want to spend more money without having firm title. Both sides had something to gain; the time was ripe and we got the deal done.

Swent: Now, the Japanese were not in on these negotiations?

Joklik: No. The parties to the agreement were Amax, CSR, and the Western Australian government. The agreement complemented our deal with Warman and Hilditch.

Swent: They were the ones who had the rights to, I've forgotten the technical term, but they were the ones who held the temporary permits to explore.

Joklik: Title to the Temporary Reserves had, by then, already passed to Amax.

Swent: Okay. So, this was your first experience at this level.

Joklik: Yes. It was the most exciting time of my life. Looking back over the years, it probably still is.

I mentioned the tunnel we'd driven into Mt. Whaleback. The assay from 54' to 538' was 66.8 percent iron and .02 percent phosphorus, which is premium grade. We recognized we were going to be able to make the Japanese a substantial offer.

##

Swent: Okay, so you had eighteen months in which to do it all.

Joklik: To export iron ore, you had to get a permit from the federal government. We met with David Fairbairn, the minister for National Development in Canberra, and asked him for a license to export 210 million tons of ore over a period of twenty-one years.

You might ask, why 210 million tons, when we had only 100 million drilled out. We were hoping to find more. We knew that getting the license would take time and that we had to do things in parallel. We engaged Maunsell and Partners from Melbourne to begin preliminary engineering. We drew up a mine development plan for a 5-million-ton-a-year project. Maunsell laid out a railroad route to Hedland. They also started on conceptual engineering for port facilities.

We installed a wave recorder at Cooke Point, a promontory just east of Port Hedland Harbor. If we were going to build an offshore berth, we needed to know what wave conditions would be during storms.

Swent: Now, these other companies were also shipping out of Port Hedland.

Joklik: Let me come back to that later. As the work progressed, Maunsell's efforts were supplemented by other contractors. We had Foley Brothers study the railroad alignment in more detail, and Morrison Knudsen review the port facilities.

### Selling Mt. Newman Iron Ore to Japanese Steel Mills

Joklik: We'd invited representatives of Japanese steel companies to come and see what we were doing. This became time-consuming. We had to prepare for their visits and interrupt whatever we were doing. They arrived in Perth from Yawata, Fuji, Nippon Kokan, Kawasaki, Sumitomo, Kobe, Nishin and other companies. They'd arrive in groups of just two or three, or maybe as many as a dozen. We'd

fly them to this primitive camp of ours at Mt. Newman, order French cuisine [laughter], put the cook in a white apron with a white hat and serve the best food and wines. Dinners would start after sundown with a lengthy happy hour, continue with a formal sit-down dinner and finish in the small hours, after a lot of singing and merry-making. The Japanese were capable singers. That's part of Japanese education. They all had good voices and knew a wide variety of Japanese and German drinking songs. The following day, we would give presentations and take our visitors on tours of Mt. Whaleback.

It was generally expected that by the end of 1964, the Japanese would award contracts to Hamersley, Goldsworthy and Mt. Newman. Well, what actually happened? On December 19, 1964, it was announced in Tokyo that Hamersley had received a contract for 65.5 million tons, Mt. Goldsworthy for 16.5 million tons and for Mt. Newman, zero.

#### One Hundred Million Ton Contract for Mt. Newman

Joklik: That news put us in a state of shock; great disappointment; beating of breasts. Nothing much we could do about it. We persevered with our work and soon received our reward. On May 7, 1965 eight Japanese steel mills signed a contract for 100 million tons to be supplied from Mt. Whaleback, beginning in April of 1969. There was celebration at Mt. Newman, in Sydney and in New York. We had caught up with and overtaken the competition.

By then, CSR had raised their stake in Mt. Newman from 45 percent to 50 percent, and were equal partners with Amax. We were getting on well together.

Swent: Did you go to Japan at all?

Joklik: Later. The contacts with the steel mills in Japan were handled by John Payne and Michel Carpentier. Michel was a potash salesman. You see, most of Amax's base metal products were sold on the LME [London Metal Exchange] and the Comex [New York Commodity Exchange]. But potash was Amax's one product for which there were regional markets. Because of this experience, he was assigned to selling iron ore in Japan.

He'd been in the United States forever, but still had a thick French accent. He used to come to Sydney and I'd meet with him. On one of his first visits to Sydney I took him to Doyle's, a well known harbor-front restaurant. Michel ordered filet



mignon, and so did I. The headwaiter was Australian. When the filet mignon was placed in front of Michel, he motioned to the headwaiter and said, "But what ees thees? I ordered rare. Saignant. Zat ees burnt." Didn't look that way to me, but that's what Michel said. The headwaiter said, "I see, Sir. This is burnt. I would be happy to bring you another." He took Michel's plate. Of course, I was the host and had to express similar outrage. So, he took my plate, too. I didn't like the look on the headwaiter's face. Sure enough, ten minutes later he came back with two portions of filet mignon. They clearly hadn't been anywhere near even a heating device. Very elaborately he set it down in front of Michel and said, "Is this to your taste, Sir?" I could see Michel wince, but he had no option but to say, "Ah, yes, zat ees bettair."

In May of 1965 we had our contract for 100 million tons. We received an export license for 210 million tons from Canberra not long afterwards. It took several meetings with Minister Fairbairn.

The contracts with the steel companies were not arranged through trading companies, which was the traditional way of doing business in Japan. We had been counseled by our Tokyo representative, Mr. Fumio Tone, who was a former director of the pre-war Mitsui zaibatsu. He said, "Look, the more you cut out the trading companies and deal directly with the steel mills, the better off you'll be." His advice proved to be right.

It's interesting that Yawata and Fuji were still separate companies, before they merged and became Nippon Steel. It didn't hurt us that Katsu Tanaka, who was Yawata's purchasing chief, had been one of the seventy-nine members of PMD-1 at Harvard. I had kept in touch with him. There's a thread of history.

Swent: Oh, yes.

Joklik: As we completed drilling out Mt. Whaleback on a 750' by 250' grid, and evaluated the data from, by then, two adits, we developed a model of the geology that differed from the original concept of surface enrichment. This was largely the work of our geologists Ray Martin and Ron McMillan. They drew sections that introduced a concept of deep, almost isoclinal folding. The high-grade iron ore was concentrated in the limbs of folds.

Swent: As opposed to surface enrichment.

Joklik: Exactly. It had a tremendous impact on tonnage potential. When we re-oriented our drilling program to test this hypothesis, we found they were right. Our estimate of potential ore reserves

then grew to several hundred million tons. By the end of 1965 and early 1966, we were talking of indicated reserves of 300 million tons, and potential of 900 million tons of high-grade hematite ore. Heady stuff.

### Project Engineering Studies

Joklik: Meanwhile, engineering was progressing. Francis Thomas came in as overall manager of the joint venture between Amax and CSR. Francis was hired from U. S. Steel; he had been General Manager of the Orinoco project, a large iron ore mine at Cerro Bolivar in Venezuela.

Francis was an interesting person. He was not given to detailed work or long hours. He would not be offended if I said he liked to manage by instinct. Initially he distrusted Australia and Australians. He was a golf fanatic; whenever the opportunity arose, he'd be out there trying another golf course. Some of us on the project, including the CSR people, got the impression that he might not stay very long, which turned out to be correct.

But what he did do was bring in an experienced EPC Manager (Engineering, Procurement, and Construction)--a man named Gus Werner. There was no question about his credentials or his experience. He was a big, massive guy. He had a habit of bullying people whom he didn't regard highly or whose capabilities he doubted, which earned him an unflattering nickname.

Swent: What was the nickname?

Joklik: "The Pig." Be that as it may, he knew his business; he quickly saw that he could rely on me if I took on an assignment. We did some crazy things. For instance, we decided to do a rough survey of the railroad route to Port Hedland. We obtained topographic maps, enlarged them, laid out the route and then spent a whole Saturday morning xeroxing 8-1/2" x 11" field sheets with the route marked on them. So, there were Gus and I, the highest paid xerox operators in Perth. We used the sheets for a barometric survey to profile the route. We established points at which people were to measure the diurnal variation. The readings at these points were to be tied together by flying a fixed-wing survey at a constant, low terrain clearance.

## Flying Naked

Joklik: A bunch of us volunteered to man the stations. We were dropped off by helicopter. The pilot had a habit of flying in hot weather dressed only in sandals!

I read my barometer periodically during the day. The ants got pretty aggressive. These were bull ants which don't back off when you confront them. As the day wore on, light began to fade. I had no food left and I'd exhausted my canister of water; still no helicopter. It was almost dark when I heard the engine and saw the light heading straight for me. Doug, the pilot, was unconcerned and scooped me up. He never flew more than about 100 feet above the terrain and took me straight back to camp. He had an incredible sense of orientation.

Swent: I'm confused about why you needed this barometric data.

Joklik: To select the railroad route. Elevations are all-important so as to avoid excessive grades for two diesel locomotives hauling maybe 100 ore cars, each carrying 100 tons of ore. An idea of the elevations was vital to determining whether the route was at all practicable for a standard gauge railroad.

This was the beginning of more detailed engineering. We had preliminary cost estimates of the project as a result of the work done by Maunsells, Foley and Morrison Knudsen. The total came to about \$160 million for a project mining 5 million tons of ore per year, hauling the ore 260 miles to Port Hedland, building unloading, stockpiling and shiploading facilities and dredging a channel and turning basin for 100,000-deadweight-ton ore carriers.

We were getting all kinds of noise about rationalization of railroad routes and communal use of ports. Hamersley Iron had gone to King Bay which is west of Port Hedland. Now, Goldsworthy was going to Finucane Island in Port Hedland Harbor. The Western Australia government people were saying, "Look, you shouldn't be wasting money on duplicating facilities. Why don't you share the railroad part-way with CRA and go to King Bay, or, why don't you go to Port Hedland and put your loading facilities on Finucane Island?" And we said, "Yes, that's a good idea, that's great!"

But Hamersley didn't want us in the business. CRA proposed outrageous terms for sharing their facilities at King Bay: \$50 million up front, no equity in the facilities, a fifty-cent-a-ton toll, plus 100 percent of the operating rights for them. Finucane Island also seemed infeasible. First, there did not appear to be enough room for our stockpiling and loading facilities, with a

capacity of 6,000 tons per hour, in addition to Goldsworthy's. We also worried about congestion and delays that might result from scheduling their relatively small shiploads with our much larger loads.

We initially planned to use the off-shore Cooke Point site, about five miles east of Port Hedland. But Francis Thomas maintained that rather than going to Cooke Point and risk having a vessel caught in a cyclone, it would be preferable to come into Port Hedland Harbor to a promontory opposite Finucane Island called Point Nelson. Now, this would require a huge amount of dredging, about 20 million cubic yards. We said this would add too much to the cost of the project. He said, "Sure, but I'm convinced it's worth it." He brought over U.S. Steel's shipping expert, Captain Bill Yost, a knowledgeable man, and he agreed with Thomas.

There were two consequences. Thomas's proposal ran counter to the Western Australian government's desire for rationalization of facilities; and it increased the project cost substantially, to well over \$200 million. Everybody went into a mild state of shock, as Thomas put it. I began to think of bringing another partner into the joint venture to share the increased cost and contacted BHP. They came to the project site.

#### Bringing BHP into the Mt. Newman Project

Swent: I'm surprised that they weren't already involved in one of these other--

Joklik: You're right. The opportunity dawned on them late in the process. Other people asked the same question. Why weren't they in on this much earlier? BHP's top management arrived at the project site in May of 1966. They had previously sent some mining engineers and geologists who adhered to the old surface enrichment theory; even with the evidence put right in front of them, they wouldn't acknowledge that major tonnage potential had been demonstrated. I think this ties into your question just a minute ago. It was difficult for them to admit here was something important they had missed.

##

Joklik: On May 14, 1966 Sir Ian McLennan who was the chairman of BHP, Jim McNeill, the chief financial officer, Bill Sweetland, their chief engineer, and Sir Ian's assistant Brian Loton came to the Mt.

Newman camp. We gave a large dinner for them which went far into the night and included party games like giving a blindfolded person three types of drink to taste--could be, say, scotch, cognac and rye--and he had to identify them. Well, you can imagine by the early hours of the morning, taste buds were anesthetized and people were failing tests between water, beer and wine. We had a great time and got to know each other.

### Death on the Airstrip

Joklik: In the morning we were going to fly them to Port Hedland to inspect the port site. At about seven-thirty I drove them to the air strip, which was only a quarter of a mile from our camp at Mt. Newman homestead. I had a DeHavilland Dove, a twin-engine plane, standing by.

When I got out of the Land Rover the pilot, Jim Hargrave, was readying the aircraft for takeoff. I said, "Morning, Jim". He was only about five feet from me. He said, "Morning, Frank" and those were his last words, because his eyes turned up, he slowly fell over backwards and, despite our best efforts to revive him he was, as far as we could tell, dead within minutes.

Swent: Good heavens!

Joklik: If this had happened a minute or two later, on takeoff, we would have been wiped out.

We radioed for another aircraft. The Flying Doctor Service took care of the body. We inspected Port Hedland and the BHP representatives recognized the potential of the project. It didn't take them long to decide to participate. The resulting percentages were CSR 30 percent, BHP 30 percent, and Amax 25 percent. We brought in Mitsui-C. Itoh for 10 percent, and Seltrust for 5 percent. I won't go into the reasons for these minority interests, but they were largely marketing related.

Swent: But you were still the operators?

Joklik: We were still the operators, but that changed. BHP clearly had the expertise and the logistic strength, in Australia, to be the operators. They had an outstanding candidate to be project manager--Bert Rogers, who had run their central engineering group. Francis Thomas was let go.



Bert was a topnotch man technically and a pleasant person. I had no difficulty working with him. My role in the project was diminished, with BHP taking over, but an operating committee was formed whose meetings I attended through project completion in 1969.

Bert Rogers was a hard worker. Within months after completion of the project he had a stroke, survived for a while and then died.

Gus Werner, who was taken off the project along with Thomas, also had a stroke and died not long afterwards.

It's an illustration of what tends to happen to people who get absorbed in these major projects. They breathe and live the project, get on a high, forget to take care of themselves, don't sleep and eat properly; the project eventually consumes them. I've seen that on other projects, too.

#### "I've Been Kicked in the Ass by Experts"

Joklik: I remember a plane trip with Bert from Melbourne to Perth. We had a couple of drinks. He was expressing his displeasure at being second-guessed by the project owners and said, "Frank, there's a way I handle these criticisms." He went on, "You may want to use this at some time or other. If someone says to me, 'You should have done this or should have done that different or better,' I say to them, 'Look, I really appreciate your comment. I think it's well taken, but you must recognize one thing, please, and that is, I've been around for some time, and I've been kicked in the ass by experts. Quite honestly, Sir, I don't consider you an expert!'" [laughter]

The port site for the Mt. Newman project was nailed down to everybody's satisfaction in the course of negotiations with the Western Australian government. The railroad route was finalized. We had learned some lessons from the construction of the Hamersley railroad. Gus and I flew over the alignment at low altitude. There had been a flash flood two days before. At one place, the rails, which were welded together in 1300-foot lengths and held by hardwood ties had been washed off the embankment and twisted together. This was 132-pound rail! The embankment, which was twenty feet high and capped by ballast, was flattened. At either end of the five-mile-long wash-away everything looked normal.

### Building the Mt. Newman Project

Joklik: To cut a long story short, the project was expertly built in two years by BHP, under the supervision of the operating committee. It set an all-time record for construction of a standard gauge railroad, and port facilities to match. The railroad set performance records, including the world's heaviest scheduled trains, heaviest axle loads and longest rail life. I learned more than I can say from my participation. The official opening took place in June of 1969, by satellite hook-up between New York, Perth, and Tokyo.

Swent: I'm thinking how much time goes into planning and negotiating. You started in '63, so it's seven years, five years of which were preparation.

Joklik: Seven years for a major mining venture, from exploration through to production, isn't long. The project came in ahead of schedule and within the cost estimate. Bechtel was the contract manager.

Swent: Why did you switch from Morrison Knudsen to Bechtel?

Joklik: Morrison Knudsen did the preliminary engineering of the port. Bechtel had responsibility for engineering and supervising the construction of the whole project. M-K couldn't have handled it. You needed one of the majors. There were really only a handful of companies that could've tackled this project.

During the first years, Japanese demand for iron ore seemed insatiable. The project was expanded from twelve to thirty million tons a year. Ore carriers of 220,000 tons were brought into Port Hedland Harbor, after additional dredging was completed.

Swent: When did Amax get out of the project?

Joklik: I think it was in the seventies.

Swent: After you had left.

### A Fantastic Business for the Owners

Joklik: Yes. Mt. Newman is now wholly owned by BHP. Mt. Goldsworthy's ore reserves were exhausted. Hamersley, Mt. Newman and Robe River supply 50 percent of Japan's iron ore imports. We can now see clearly that window of opportunity that existed in the 1960s, when

the Japanese were running out of their traditional sources of supply and foresaw expansion of their steel industry. Looking back over the past twenty-five years, it's been a fantastic business for the owners of the project.

Swent: Did they build those concentrating facilities and the steel plant?

Joklik: The agreements were re-negotiated. I believe both Hamersley and Mt. Newman are planning DRI [direct reduced iron] projects, using natural gas reserves that have been discovered nearby.

Swent: So you were there at just the right moment.

Joklik: Yes. We'd moved from Sydney to Perth in June, 1965.

Perth was then, and is now, a beautiful city. Perth is on the shores of the Swan River; the Port of Fremantle is ten or twelve miles down the river on its estuary. Singapore is closer to Perth than Sydney or Melbourne are.

#### At Home in Perth; Pam's Mt. Newman Adventure

Joklik: Once we'd established ourselves in our new home, Pam came with me on one of my frequent trips to the Mt. Newman project site. The occasion was a visit by Charles Court. No sooner had he departed than it started to rain. By the following morning, the air strip had become so soft that the plane got bogged. We waited, but the rain wouldn't stop. After a couple of days, we tried to drive out. But creeks which were normally dry had turned into torrents.

Fortunately, we weren't alone at the camp. Stan and Ella Hilditch were there; also two good friends, Ed Douglas and Des Wright who'd signed on as project engineers. Between Ed, Des, Stan and myself, we finally managed to pull the Cessna 337 from the bog and wheel it over to the homestead. Behind the homestead was a broader road that led east. The pilot said that if he took just me, he would attempt to take off on a 1500-foot stretch of straight road.

Pam was then about five months pregnant with our second child. She was anxious to get back to Perth. I said to the pilot, "If you're willing to risk it with me, another 120 pounds shouldn't make any difference." He finally agreed, and Pam and I climbed on board.

The pilot stationed Des and Ed along the straight stretch; it was agreed that if we weren't airborne at the point where they stood, he would try to abort the landing. He gunned the engine, swung into the straight stretch and sped down this improvised runway. When we got to Des and Ed, we still were not airborne.

The pilot had a split second to make a decision. He concluded there was more risk in trying to abort the landing, than going all out. He finally wrenched the plane off the ground, with the stall warning screeching. It must have been no more than ten or twenty yards to a sharp bend in the road at the end of the straight stretch. We made one circuit, waved to Ed, Des, and Stan and headed for Perth.

To round out this tale, a couple of days before our escape, we had lined up a helicopter to come and take us out, but the machine crashed soon after takeoff from Perth--fortunately no one was hurt. The machine was a writeoff.

I mentioned Des and Ed. Another stalwart of those days was Ron Duff, who handled financial matters. He was a soft-spoken but very effective numbers man who stayed with us right through the project and made major contributions.

Pam's pregnancy ended when Katie was born on November 7, 1966, in Perth. So, we had a boy and a girl. Katie quickly established her independent nature and grew up from a fairly scrawny baby into a beautiful young woman. She's still the apple of her father's eye.

While the Mt. Newman project was progressing, I still had responsibility for exploration in the rest of Australia. The next major project that came along partly overlapped with Mt. Newman. That was the Kimberley bauxite project.

Before I start talking about that, though, I should mention two diversions.

#### Mamut, Sabah, Copper Prospect ##

Swent: One was to Sabah in Borneo.

Joklik: Yes. A porphyry copper deposit had been discovered on the slopes of Mt. Kinabalu. I took a small crew to Jesselton, the capital of Sabah. We climbed several thousand feet to inspect this prospect. The question was whether we should submit a bid. Certainly, the

deposit had appreciable tonnage and from our sampling, the average grade was between .6 and .7 percent copper. But, considering the remote location, we decided against bidding. The development rights were subsequently awarded to a group of Japanese companies.

One evening, we were at the residence of the Governor of Sabah--a beautiful home overlooking Jesselton. We were sitting out on the lawn. Suddenly I felt something bite my leg and found this seven-inch-long poisonous centipede--

Swent: Oh, my!

Joklik: --taking a piece out of me. Well, I didn't suffer any ill effects.

We went swimming in the harbor. There were large jellyfish floating in the shallow water. One of my friends picked one up and threw it at me. Its tentacles whipped across my face and left red welts, which were noticeable for a number of days.

To complete my roundup of the wildlife in Jesselton, when I went to bed that night I heard a soft galloping sound. I switched on the light and there were a couple of cockroaches, at least three inches long. I called the desk. They brought DDT, but we never did catch them. I learned afterwards that you can train these cockroaches for racing. [laughter]

#### Gazelle Peninsula with Peter McNabb

Joklik: The other trip I should mention was to Papua New Guinea, where there had been a report of porphyry copper mineralization on Gazelle Peninsula, which is the northernmost part of the island of New Britain. I undertook this trip with Jack Thompson, an old New Guinea hand--not in age but experience--from the Bureau of Mineral Resources, and with a local geologist named Peter McNabb. The reason I mention Peter is that, later, he played an important role in the discovery of the Lihir Island gold deposits.

Swent: I think I just heard him give a talk last week, or last month, at the AIME Section down in San Francisco.

Joklik: Peter impressed me not only as a capable geologist, but also by his skills in the jungle on Gazelle Peninsula. He insisted on going barefoot. He also knew the ways of the local Nationals. We were crossing a fast-flowing stream. Traversing through the jungle was thirsty work and we were sweating. I scooped up some



water with my hands and noticed a couple of our bearers watching me uneasily. I said to Peter, "What's biting those guys?" He said, "Well, they really think you're pretty crude. It's a dirty habit to drink from your hands." And I said, "How do they do it?" And he said, "Well, look!" They were splashing water in their face and mouth without holding it in their hands. I decided to adopt the local standards of hygiene.

Swent: He gives a wonderful slide show, incidentally.

Joklik: Well, Peter has been to many parts of the world.

#### Manager, Kimberley Bauxite-Alumina Project

Joklik: Mitchell Plateau and Amax's aluminum business bring to mind Ian MacGregor. Have you met him?

Swent: No, I've never actually met him. I've heard a lot about him, of course.

Joklik: He's articulate, urbane and a broad thinker. Many have had the same experience as me, that after you'd been to his office--he was always accessible--and talked to him for a half hour, you left feeling you'd just heard the sound of a full-blown orchestra. Then it took you an hour to figure out, now what did he say? If you came down to it, sometimes he hadn't told you a heck of a lot. [laughter]

He was, and is--he's eighty-four and still active--a good listener. As he mulled over some issue, he'd talk to anybody and listen, which occasionally gave an impression of indecisiveness. But once he'd gathered sufficient information, he'd make a decision and stick to it. MacGregor recognized Amax's overdependence on the molybdenum business and brought about the company's diversification into aluminum, iron ore and coal. In each case, the board initially opposed him. His strong ally was Gordon Reid, the oil man I mentioned before. Ian won key board approvals under threat of resignation.

MacGregor eventually retired as chairman of Amax and joined Lazard Frères. He was tapped by Margaret Thatcher to head up British Steel. Having done good things there, he became chairman of British Coal.

Swent: That's where he used these same skills again.

Joklik: Yes. Amax's interest in bauxite arose from MacGregor's acquisitions of aluminum fabricators--Kawneer, Hunter Engineering and others. Backward integration became an issue.

### Surprise Discoveries of Bauxite

Joklik: Until the 1950s, it was generally believed that Australia didn't have any bauxite deposits. That changed when Rusty Evans, a geologist working for CRA, prospected the western shore of Cape York Peninsula in Queensland and found the Weipa bauxite deposit--one of the richest in the world.

We analyzed the prospects in Western Australia. Ken Malcolm, who had worked for us at Mt. Newman, knew of bauxite occurrences in the Kimberley region, particularly on the Mitchell Plateau. We sent him up there with a small crew. Sure enough, they came back with reports of bauxite occurring between the Mitchell and Lawley Rivers. They collected samples that assayed 40 to 45 percent available alumina. Weipa bauxite runs more like 53 to 55 percent. Still, it was an interesting discovery because of the potentially large tonnage.

Swent: Now as I understand it, there are other things that you have to think of with aluminum, though. You need power and--

Joklik: For smelting you do need ample cheap power. But for bauxite mining the power requirements are relatively modest.

Swent: Okay.

Joklik: The results of our prospecting in 1965 were sufficiently encouraging to undertake a second exploration season in 1966. The rainfall in that country is a lot more plentiful than at Mt. Newman. We had forty inches in the summer of '65-'66, just in a couple of months. The bauxite deposits are near the shore of Admiralty Gulf at Port Warrender, and extend inland for about twenty miles.

We mobilized several reverse circulation truck-mounted rotary drills, and also began a program of test-pitting to provide larger samples. By the end of the 1966 season we'd outlined an inferred reserve of 180 million tons.

That was enough to encourage us to build a pilot upgrading plant at the site. The plant consisted of a crusher and screens.

We screened out clay and reactive silica which would consume caustic soda in an alumina plant. This work continued into 1967.

Swent: Excuse me, was this a traditional thing to do, or was this something new that you developed?

Joklik: Not really new. It was a matter of finding the size fraction in which the ratio of available alumina to reactive silica would be optimized.

Swent: And did you have people on your staff who could do that?

Joklik: Yes. By the end of the 1967 season we had defined a reserve of two hundred million tons which would yield a product containing 44 percent available alumina and 2 percent reactive silica.

We had, meanwhile, done conceptual engineering with the aid of our friends at Bechtel. They drew up a plan for mining and beneficiating bauxite and building an alumina plant with a capacity of 600,000 tons per year. Our preliminary estimate of the capital cost was \$140 million.

#### Formation of International Joint Venture

Joklik: As in the case of Mt. Newman, our thoughts concerning markets and capital turned to Japan. Sumitomo Chemical and Showa Denko both were interested. Billiton, based in The Hague, wanted to negotiate participation in the project. And VAW, headquartered in Düsseldorf, agreed to supply technology for the alumina plant. After months of negotiations, we formed a joint venture which included Sumitomo, Showa Denko, Billiton, VAW, and Amax.

#### Negotiating Development Agreement with Sir Charles Court

Joklik: After we had developed preliminary cost estimates, it was time to visit our friend Charles Court and negotiate an agreement for the development of these deposits. Andy Chandler again helped me.

The provisions of the agreement included a lease payment of five dollars a square mile per year, and a royalty of \$.125 per ton of bauxite exported and \$.075 per ton used in an alumina plant built locally.

At one point, Charles Court thought it would be good for his parliamentarians to visit the project site. He chartered a couple of F27's for the trip to Mitchell Plateau. Mr. Court led his parliamentarians off the planes and we had vehicles ready. We first visited the beneficiation plant and were headed for the port site. There were many tracks through the bush. The ground was thickly covered with scrub and pandanus palms. I was driving the lead vehicle and came to a fork. Mr. Court, who was sitting beside me, was watching me and noticed the slight hesitation. As I took the track to the right, he said, between clenched teeth, "Are you sure?" And I said, "Yes." Then he looked at me, narrowed his eyes and said, "You'd better be right." [laughter] You can imagine a column of vehicles carrying these parliamentarians taking the wrong track and having to do a U-turn. Fortunately, I was right and we had a good day.

We found a family of emus near the camp. One of the male emus fell in love with a yellow Land Rover. He used to get close to this vehicle and do a mating dance. [chuckling]

As the project progressed, we focused on the economics. The design capacity of the alumina plant rose to one million tons per year.

The pattern of my travels was changing. I was spending much of my time at the headquarters of Amax's aluminum division located in Greenwich, Connecticut. Therefore, in the spring of 1968, we decided to move and bought a house in Cos Cob which is part of the town of Greenwich.

#### Relocation to Greenwich, Connecticut ##

Joklik: We left Perth on May 5th, 1968 after numerous farewells. Carl was four years old and Katie two. We'd lived in Australia for five years. En route to Connecticut, we paid calls on our remaining relatives in Vienna and England. Pam and I had by then lost both our parents.

We arrived at our new house in Cos Cob on my fortieth birthday. Only a month later, I recall, Bobby Kennedy was murdered.

The Amax aluminum group was led by Steve Furbacher. Steve's career had been in aluminum fabricating. He was a man with a great sense of humor, a quick thinker, excellent businessman, and socially very active. Working with Steve was a lot of fun. I

recently happened to be on a flight with him and was glad to find he hadn't lost his sense of humor.

I developed an international travel routine, trying to hold this international consortium together, with two companies in Europe, two in Japan, Amax in the U.S. and the project site in Australia.

Swent: By now you were severed from Mt. Newman, pretty much?

Joklik: Well, I still attended operating committee meetings. The visits to Australia generally killed two birds with one stone: Kimberley and Mt. Newman. Mt. Newman came on stream, as you'll recall, in June of '69.

Swent: '69, so it was well under way.

#### Planning a Major Alumina Process Plant

Joklik: Yes. The participants in the Kimberley project were committed to taking their share of the alumina. Showa Denko and Sumitomo had smelters. VAW was the supplier of Bayer Process technology and operated smelters. I can't remember whether Billiton had a smelter, or whether they intended to supply someone else's smelter.

We made numerous visits to the smelting plants of these companies and discussed the capacity of the project, the quality of the product, etc. There's floury alumina and sandy alumina, depending on grain size. The Europeans or the Japanese wanted sandy--one wanted sandy, the other wanted floury. There were dozens of meetings in various parts of the world.

In time, we increased the alumina plant size to 1.5 million tons a year, at an estimated cost of \$422 million Australian dollars, and I'll talk about that in a minute.

Swent: So, it went from one million to 1.5 million. That's a big increase.

Joklik: Yes. The expansion was motivated by the need to improve the economics of the project.

We made many visits to Düsseldorf, and to the Lünen alumina plant of VAW. The key players there were Dr. Klaus Bielfeldt and Dr. Kaempf. They were outstanding technicians who masterminded



the pilot plant program for the design of the grinding, digestion, filtration, liquor cleaning and calcination facilities. I worked closely with our chief process engineer, Jack Miller. On our trips to Japan, we became ardent fans of Sumo wrestling, which impressed our hosts.

### Move to San Mateo, California

Joklik: Steve Furbacher resigned as president of Amax Aluminum in '69; his place was taken by Dave Mayers. Dave had a penchant for the West Coast of the United States. He persuaded Ian MacGregor, who had by then succeeded Frank Coolbaugh as President of Amax, to move the Amax Aluminum headquarters from Greenwich to San Mateo, California.

We sold our house in Cos Cob early in 1971. It had been our first experience of home ownership and a happy one. The house was on a cul-de-sac and new when we bought it. We had much fun furnishing it and planting a garden. We had a great circle of neighbors, mostly with kids the ages of ours. It was a tough environment to leave after only three years, but our lives had been brightened by the birth, in January 1970, of our third child, our son Paul.

### The Queen Elizabeth as Construction Camp

Joklik: As the engineering of the Kimberley project advanced, we tried some far-out ideas. For example, using a floating construction camp in Port Warrender. We chose the Queen Elizabeth. I flew to Fort Lauderdale where the ship was berthed and, with the help of a couple of experts, went over her from stem to stern. She was beginning to show signs of neglect. But that didn't deter us.

What did deter us was the consideration that, with a construction work force of 1,500, how would you gain access through the narrow gangways in case trouble broke out anywhere? You just couldn't exercise control. We regretfully turned down the Old Lady. She was finally towed for salvage to Hong Kong, burnt to the water line outside the harbor and sank. Sad.

I was doing so much traveling that Pam and I sometimes had difficulty meeting up. On one occasion she was in London while I was in Australia. We agreed, on short notice, to meet in Zürich.

From Zürich we went to Zermatt and had a couple of weeks' skiing. We both needed the R & R, and had a very pleasant sojourn by the Matterhorn. As we were returning to the hotel one afternoon, skis over our shoulders, I saw this fellow coming in the opposite direction. He was still about 100 yards away when I said to myself, "There's something familiar about him." It turned out to be Derek McLaren, whom I had last seen when I left Cranbrook in 1944. It's amazing how just the way a man walks is so characteristic that you can't miss it, even after a hiatus of thirty years!

Swent: Thirty years.

### Snoring Outside the Prime Minister's Office

Joklik: MacGregor took a keen personal interest in the Kimberley project. Sometimes, when I took lobbying trips to Canberra in connection with political issues, he would join me there. On one occasion, we were due to see John Gorton. Robert Menzies, after sixteen years in power, had retired in 1966 and was succeeded as prime minister by others of his party--Holt, Fraser, McMahon and then John Gorton.

MacGregor and I had seen several senior cabinet ministers and were waiting outside Gorton's office in Parliament House. Ian was a bit jet lagged, fell fast asleep and started snoring loudly just outside [laughter] the door of the prime minister's office. Aides were scurrying in and out and came to a dead halt when they saw this man, at peace with the world, waiting to see the prime minister.

I already mentioned that in February 1971 Steve Furbacher was replaced by Dave Mayers who transferred the Amax Aluminum head office to San Mateo, California. That's how we came to live in Hillsborough, just west of San Mateo. We bought a pretty house, built a swimming pool and soon got used to the ambience of the San Francisco Bay Area.

The heavy travel load of the Kimberley project continued. I was away from home about 70 percent of the time. On long trips I sometimes got colds that developed into bronchitis. With my constantly jet-lagged state, I found it increasingly difficult to shake off minor illnesses.

### Alcoa Pre-empts the Kimberley Project

Joklik: VAW began to be lukewarm about the project. The Japanese companies were still strongly supportive, particularly Sumitomo under the leadership of Mr. Sugano, who was the head of their light metals division. He was an outstanding man, a tall, distinguished presence. Sometimes one thinks of the Japanese as playing their cards close to the chest. Not him. It was always possible to have a frank discussion with him.

There were several factors that eventually led to the abandonment of the project. First, metal prices and alumina prices declined in the early seventies. The Australian dollar strengthened to \$1.19 U.S., which meant that operating in Australia was going to be a lot more expensive than we'd initially estimated. What finally killed the project was our deal with Alcoa.

During the sixties and seventies, Alcoa developed major bauxite mines in the Darling Ranges, thirty to forty miles east of Perth. These were based on excellent bauxite deposits, the extent of which wasn't fully known when we first started exploring in the Kimberleys. They built an alumina plant at Kwinana, probably the lowest cost alumina plant in the world. They weren't keen on competition from bauxite operations in the Kimberleys and offered us a long-term alumina supply which was impossible to refuse. It was based on cost plus very little. The value of the Mitchell Plateau project was that it induced Alcoa to negotiate an extremely favorable long-term supply contract with Amax. The alumina was used in a new smelter Amax built at Bellingham, Washington.

Swent: So, Amax built a smelter in Washington State and supplied it with alumina from the Darling Ranges from Alcoa. And you bypassed the Kimberley project completely?

Joklik: Yes. It was later sold to CRA, although they had no need to develop Mitchell Plateau. They owned huge reserves of bauxite at Weipa in Queensland.

Swent: That must have been disappointing, though.

Joklik: It was.

Amax Vice President for Australia

Joklik: I had meanwhile been made a vice president of Amax, with responsibility for Amax's interests in Australia. I believe that was early in 1973.

Swent: But still based in Hillsborough?

Joklik: Yes. I also had an apartment in Sydney.

I was eager to get Amax involved in a number of interesting projects, but in October of '73, I had a call from a headhunter saying, "Big Mike wants to see you."

I went to see Big Mike in New York. He said, "Brother Joklik, it's time to come back to Kennecott. We need you for exploration and development." I took a long time to think it over. Mike rang and said, "I need an answer." It just happened that Ian MacGregor was out of town. I felt I couldn't keep Mike waiting any longer and said, "Yes."

When MacGregor came back, he said, "What a shame I was away." He tried to persuade me to change my mind, but I had given Mike my word. I committed to starting with Kennecott on the first of January, 1974.

## VI KENNECOTT PHASE TWO--VICE PRESIDENT, 1974-1979

Swent: Let's get kind of oriented to '74 here a little bit.

Joklik: Yes, the return to Kennecott! Since I'd left, the El Teniente mine in Chile had been lost and Peabody Coal had been acquired.

Swent: And new personnel.

Joklik: Frank Milliken was still in charge. Net income in 1973 was \$160 million, including earnings from Peabody. Earnings would have been higher, but for federal price controls on copper.

Swent: Yes, that was something I wanted to ask you. I'd made a note about that.

Joklik: Nixon had this idea of controlling inflation by putting a clamp on commodity prices. Remember?

Swent: I had not remembered, no.

Joklik: The London Metal Exchange price rose from \$.47 a pound at the beginning of '73 to \$1.20 a pound in December, but the domestic price, which was controlled by the Cost of Living Council, rose to only \$.68. Which was still good in relation to the cost of production, but only half of the free market price.

### Prosperity Dimmed by Oil Shocks ##

Joklik: In 1974, the picture began to change because the economy turned down, and world demand for copper declined rapidly in the wake of the 1973 oil shocks.





Kennicott•

Greens Creek•

•Lac de Gras

•Yellowknife

Ungava  
Peninsula

•Gaspé

•Garon Lake

Rouyn-Noranda•

•Amos

Québec•  
City

Powder River  
Basin

•Lead

Flambeau•

•Green Mountain

Barneys Canyon

Cortez•

•Salt Lake City

•Bingham Canyon

Rawhide

•Nevada

Mines

•Climax

Baltimore•  
Refinery

•Questa

Ozark Lead•

NC Phosphate•

Ridgeway•

Ray•

Safford•

•Chino

•Bolaños

The costs of materials needed for the production of copper rose by nearly 75 percent in 1974. The prices of petroleum products rose by more than 100 percent.

Swent: It was a wild time to be in the minerals business, wasn't it?<sup>1</sup>

Joklik: It certainly was, for any kind of business. Spot prices of coal rose dramatically in 1974, but Peabody was tied to long-term, unescalated sales contracts.

Kennecott was spending \$300 million for the partial rebuilding of the Utah Copper smelter, in response to environmental regulations. That's when that tall stack was built; it was outdated before its completion, because meeting emission standards through dispersion was already a no-no with the EPA.

Kennecott was still deriving the bulk of its income from four porphyry copper mines.

Swent: The four domestic mines.

Joklik: Yes. Expenditures on exploration between 1960 and 1978 totalled \$200 million of which 80 percent was spent on copper exploration. The main thrust was porphyry copper in the southwestern United States.

There were other targets. Kennecott was exploring for porphyry copper deposits in Indonesia, particularly on Sulawesi. The Tanama prospect, in Puerto Rico was discovered; Ok Tedi, in Papua New Guinea, was under negotiation. The Safford project in Arizona looked promising. In addition, the Arctic massive sulfide deposit had been discovered in Alaska, and near it the Ruby Creek prospect was being drilled. Copper and nickel prospects in the Duluth gabbro were being tested. And, last but not least, ocean nodules were still receiving attention, but the United Nations Law of the Sea Conference was clouding the outlook.

A research group here in Salt Lake City was supporting the exploration program. This group was not well directed, nor was Kennecott's Ledgemont research lab on Route 128 outside of Boston. They were absorbing a budget of \$20 million a year on unfocused, general research.

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<sup>1</sup>Simon Strauss, Market Analyst for Non-ferrous Metals and Non-metallic Minerals, Journalist, Mining Corporation Executive, 1927-1994, Regional Oral History Office, University of California, Berkeley, 1995.

In 1975 Kennecott's long-term debt rose and copper prices fell. Metal production at the four domestic mines was declining because of poor demand and because the production facilities were antiquated and hadn't been maintained as they should have been.

Swent: How much of this had Michaelson discussed with you?

Joklik: Of what?

Swent: Well, I mean, did he lay it out this way, that they--?

Joklik: No. When I joined, everything still appeared to be in good shape.

In fact, there was tremendous optimism. The day I told Ian MacGregor that I was leaving, he said, "Have you been wooed by our rich cousins?" It was only in the second half of '74 and in '75 that the situation deteriorated.

Swent: What, precisely, was your job when you went back?

Joklik: I was vice president, Exploration and Development for the Metal Mining Division.

Swent: Were you replacing somebody else?

#### From Hillsborough, California, to Darien, Connecticut

Joklik: Yes. Lowell Moon, an excellent engineering geologist, who retired. I left sunny California, and on January 3rd of '74 I reported for duty in the Kennecott office at 161 East 42nd Street, New York. In my spare time, I went house hunting and found a charming place in Tokeneke, which is a part of Darien, Connecticut.

Pam and the kids joined me when the school year was over. We sold our home in Hillsborough and realized a good gain. If we'd held onto it, we'd have made much more, because those were the days of double-digit inflation, and home prices were going through the roof.

First I familiarized myself with Kennecott's ongoing operations. I toured the mines and reviewed the copper ore reserves. Apart from that, I got immersed in two projects.

North Carolina Phosphate Project

Joklik: One was the North Carolina Phosphate project, which had an interesting history. The occurrence of phosphates in North Carolina had been known for some time. The deposits are on the south shore of the Pamlico River estuary and comprise extensive reserves. The grade is expressed in terms of calcium triphosphate, popularly known as bone phosphate of lime, or BPL. The concentrates prepared from this phosphate rock averaged 67 percent BPL, which is competitive with central Florida--a little lower grade, but still respectable.

Kennecott had outlined 400 million tons of reserves. The project was planned for a capacity of 3.7 million tons a year of concentrate for export to world markets. Now, in 1958 Kennecott had taken in Agrico Chemical Company as a partner in the project to supply technological and marketing expertise. But because of world oversupply, nothing was done for the next fifteen years, until I appeared on the scene.

The plan was to produce calcined concentrates at the mine and barge them through the Inland Waterway to Moorehead City for loading on seagoing bulk carriers and export, mainly to Europe. The main competition in the market would be from Morocco, which has the world's largest, highest grade phosphate deposits.

The phosphate values in these deposits were in a layer of gravel forty feet thick overlain by ninety to 120 feet of sand and silt. What you had to do was mine ten tons of material to produce one ton of calcined concentrates. The capital costs for the project were estimated at \$260 million.

We ran into permitting problems because environmentalists in the area claimed that this was the one and only habitat of the canvasback duck. We found that the canvasback duck had numerous other habitats, but it took us a couple of years to convince the Fish & Wildlife Service. In the end, the Secretary of the Interior overruled the regional director of the Fish & Wildlife Service to issue the necessary permits.

Swent: Now, they'd been just sitting on this for almost twenty years?

Joklik: Fifteen years.

The Agrico Chemical Company, ACC as it was called, was merged into, or bought out by the Williams Companies out of Tulsa, Oklahoma. Their interests were mainly in oil and gas transmission

pipelines. Their involvement in the agricultural chemicals business was something new.

I got to know John and Joe Williams. John Williams was the chairman of the Williams Companies--a soft-spoken, urbane man with a quick mind. He was later succeeded by his cousin, Joe who, I think, is still running the Williams Companies.

Agrico was headed up by a mining engineer named Ray Garcia, with whom I worked closely on this project. I appointed Ward Grosz as manager of the North Carolina project. Ward came from Kennecott's Ely, Nevada operation and had gone out to Australia to manage Kennecott's interests in the Ok Tedi project, which came to naught because Kennecott found it impossible to negotiate a satisfactory development agreement with the government of Papua New Guinea.

Ward did an effective job. We worked with Rust Engineering out of Alabama and Bechtel in putting together a design for the project. We bought a couple of draglines from Marion to remove overburden. The draglines were delivered and assembled at the site, but the remaining problem was disposal of the product.

#### Marketing Campaign in Europe

Joklik: I established contacts with a number of companies, principally in Europe. They included Fisons in Britain, Prayon in Belgium, Pechiney and Rhone Poulenc in France, and Metallgesellschaft and BASF in Germany. I found myself well-received on these marketing trips. As I was leaving the office of one of these procurement executives, the Moroccans would be waiting in the antechamber [chuckling]. They were tough competition in terms of price and demonstrated ability to supply.

Swent: They were a lot closer, for one thing, weren't they?

Joklik: With bulk shipping, once you get a product on board, it doesn't matter much whether you go 1,000 or 3,000 miles. It's the stockpiling, loading, unloading, and land transportation that's the expensive part.

Swent: This was the first time you had gone into active marketing, wasn't it?

Joklik: The Kimberley bauxite project also involved marketing.



Swent: Now, you had earlier mentioned that you were beginning to have some health concerns.

Joklik: Yes. I was traveling so much towards the end of my employment with Amax that I was having difficulty shaking off colds. But when I rejoined Kennecott and we moved to Connecticut, the traveling diminished. These phosphate marketing trips were maybe ten days at a time, one every three months. It was nothing compared to what I had been doing. The problem with getting rid of colds and occasional bronchitis disappeared and never recurred.

I even found time to take up tennis again. I used to play when I was young. We joined the Tokeneke Club. Both Pam and I played a lot of tennis, so I was getting plenty of exercise.

On one of these marketing trips I had Pam join me in Paris. I could never again convince her that my travels involved great hardships. She did a marvelous job of refurbishing the stone house we bought in Tokeneke. She also became active in the organization of ex-Pan Am stewardesses called World Wings and ultimately became president of the Connecticut chapter.

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Joklik: Although I was making progress with marketing phosphate, I hadn't hit the right button. I recognized that the only way I was going to be successful with potential off-takers of our share of the production would be to tie them in as equity participants.

Meanwhile, Agrico and the Williams people, observing our increasing pre-occupation with marketing, were saying, "You'll never succeed, why don't we buy you out?"

Our neighbors, Texas Gulf, offered us \$35 million cash for our share of the project. There was sentiment in Kennecott for accepting their offer. When I say "sentiment," I'm talking about Tom Barrow. Frank Milliken had retired. Tom, formerly vice chairman of Exxon, was elected Kennecott's president and CEO on January 12, 1978. He studied the history of the project and thought it was time to cut bait.

#### Superfos Supplies the Key

Joklik: I said, "Over my dead body!" I had established contact with Superfos of Denmark who would not only have taken our share of the output, but also bought an equity position.

When Williams became aware of our dealings with Superfos, they became agitated because they saw us as a nascent competitor, what with our mining expertise and Superfos's marketing network. I pursued my negotiations with Superfos until, one day, I had a call from the Williams people saying, "We need to talk."

Swent: Did you have regular meetings with them?

Joklik: Yes. We were joint venturers.

Swent: How did they find out about Superfos?

Joklik: Oh. It's a small world in the fertilizer business.

They came to see us, and said, "We think it's time to part ways; we want to buy you out." We responded, "Really? You think you want to do that? It's going to cost you." And they said, "Yes, but we're ready to bite the bullet." We sat there in dead silence until they said, "The most we can justify is a price of \$150 million." We tried to keep our composure. I said, "I think we need to caucus." We left the room [chuckling], and outside we said, "Did they say \$150 million? The worst thing we can do is to insult these good people by taking \$150 million. We have to make them feel good and ask for \$165 million." We went back in the meeting and said, "Gentlemen, we find your offer disappointing, but we recognize the increasing difficulty in jointly developing this project. It's going to cost you \$165 million." Before the meeting was over, they said, "Okay, it's a deal at \$165 million." So, with only \$20 million in the project, we sold out for \$165 million.

Meanwhile, Tom Barrow was trying to fight off Curtiss-Wright's take-over bid for Kennecott. Part of the settlement was that Kennecott would buy Curtiss-Wright's subsidiary, the Dorr Oliver Company of Stamford, Connecticut. The price agreed to was \$160 million. That was far more than should have been paid. As it turned out, the money obtained from the sale of North Carolina Phosphate was used to pay off Curtiss-Wright.

Swent: The money came in handy, but [chuckling].

Joklik: Yes. It could have been better applied.

### Questa Molybdenum Project

Joklik: The other major exploration project we got involved in was Questa Molybdenum. Molycorp, which was then an independent public company, was operating the Questa Mine--

Swent: This was in New Mexico, wasn't it?

Joklik: --in the foothills of the Sangre de Cristo Mountains in northern New Mexico. The mill capacity was 15,500 tons a day of open pit ore. Moly prices were about \$2.50 a pound. The outlook for moly was good because the General Services Administration had just disposed of their last 35 million pounds of  $\text{MoS}_2$  from their stockpile. It seemed the price was going to remain strong for some years, which actually turned out to be the case. Molycorp were looking for a partner to expand operations. We negotiated a two-year option agreement with them to earn a 50 percent interest. We had to spend a minimum of \$5 million.

Swent: Now, had this been done before you came back to Kennecott?

Joklik: No. I negotiated the deal with Bill Kuntz who owned much of Molycorp. The manager at Questa was Gene Dewey. We appointed a project manager, Gordon Lister, one of our experienced geologists.

### Expansion of Ore Reserves

Joklik: We set about drilling. We proved up 124 million tons, averaging .32 percent  $\text{MoS}_2$ , which would have to be mined mostly underground. .32 percent is a pretty good grade. There was potential for more tonnage. We were contemplating a block caving operation of 30,000 tons a day, producing 28 million pounds  $\text{MoS}_2$  a year. By 1977 the price had risen to \$4.00 a pound, as compared to \$2.43 when we concluded the joint venture agreement with Molycorp.

### Federal Trade Commission Blows the Whistle

Joklik: A dampening factor was that Amax had commissioned the Henderson Mine in 1977. It was rated to produce 50 million pounds a year. But that didn't scare us off.

What did scare us off was the Federal Trade Commission, with whom Kennecott already had a history of bad experiences, both in connection with the Okonite acquisition, when I worked on the "Copper Mines of the World" study and later, the Peabody acquisition, which was challenged--I'm not sure whether it was by the Federal Trade Commission or the Justice Department.

The Federal Trade Commission phoned us and said, "We know you're thinking of going to Phase II of this project, the implementation of a new mine at Questa. We want to warn you that, taking into account your moly production from porphyry copper deposits, we're going to challenge it. You may find you'll waste a lot of money and in the end have to divest yourselves, as you've had to in the past."

It was typical of the poor relations Kennecott had in Washington with the executive branch and with Congress. As I later learned, the way to lobby in Washington is to go yourself, and go often. It was shocking that the FTC, with a phone call, could scare Kennecott off this project.

Swent: So this was considered restraint of free trade?

Joklik: That's right.

Swent: When was U. S. Borax trying to produce its big one up in Alaska?

Joklik: At Quartz Hill?

Swent: Yes.<sup>1</sup>

Joklik: That came a little later. Moly prices declined after the late seventies because of reduced demand for steels used to manufacture oil well drill pipe. At the same time, by-product output of moly increased, particularly in Chile. The price drop put pressure on the pure moly producers. They went out of business. Kennecott's Alice Arm project in British Columbia fizzled. Thompson Creek shut down. Quartz Hill never materialized. Questa, in the end, ceased operations. Amax had to shut down Climax and reduce production at Henderson.

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<sup>1</sup>Carl Randolph, Research Manager to President, U.S. Borax & Chemical Corporation, 1957-1986, Regional Oral History Office, University of California, Berkeley, 1992.

Eugene David Smith, Working on the Twenty-Mule Team: Laborer to Vice President, U.S. Borax & Chemical Corporation, 1941-1989, Regional Oral History Office, University of California, Berkeley, 1993.



We decided not to pursue Phase II. We were bought out by Molycorp for \$13 million, which was about twice what we had in the project. Perhaps the FTC did us a favor.

Swent: A learning experience.

### Kennecott's Mining Business Moves to Salt Lake City

Joklik: As Tom Barrow took over the leadership of Kennecott, the dispute with Curtiss-Wright, the forced sale of Peabody and the acquisition of Carborundum in November, 1977, caused changes in the structure of the company. A new management team emerged. A strategy council was set up, of which I became a member. I was elected a vice president of Kennecott, in charge of Exploration and Business Development. The mining business of Kennecott was to be headquartered in the West, in Salt Lake City. Glenn Bakken was appointed president of this group. The remaining parts of Kennecott were Carborundum, QIT (Quebec Iron & Titanium), and Chase Copper and Brass, of which Bakken had been president for over twenty years.

I'd gotten to know Glenn well during my frequent presentations to the Kennecott Board. That was something Frank Milliken insisted on, which I thought to be healthy. If there was a case to be made for capital expenditure, the executive responsible would appear before the Kennecott Board. The board members would hear his story firsthand, instead of getting it filtered through an intermediary. Peter Grace became a good friend of mine.

Glenn came to me one day and said, "Joklik-san," (we sometimes addressed each other "san" because of dealing with the Japanese on Chino and other matters), "Joklik-san," he said, "I will be in Salt Lake City from the 1st of April and would be honored if you would join me there. If, however, you will not be there on that date, don't bother coming later!" [chuckling] I said, "I understand." Pam and I had a difficult decision to make, because I was by no means certain that this was a good move, and I didn't relish the thought of once again uprooting the family. She showed a great deal of courage. We concluded that I should seize this opportunity and come out to Salt Lake with Glenn Bakken.

Swent: This was, what was the date, then? Seventy-eight?

Joklik: April, 1979.



Swent: Seventy-nine.

Joklik: We had been in Connecticut for five years, which was the longest we'd stayed anywhere since Pam and I got married.

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Joklik: Fortunately, our daughter Katie had recovered from her injuries. You see, we periodically went on ski trips with the kids to Vermont and other parts of New England. Previously, Pam and I had usually headed off to ski in Europe. But with the kids, we just piled everything in the station wagon and drove up to Vermont. Well, on the last day of the season, Katie broke her leg. She had a spiral fracture of the tibia. She was still recovering when her crutches slipped on a wet floor at the Tokeneke Club. She fell and broke her femur, right through the growth plate. She was laid up for the best part of half a year. By the time of our move to Salt Lake, she was already skiing again.

Another milestone was that I had actually survived my fiftieth birthday. We celebrated it in early June of 1978 with a party at our home to which we invited a large number of our friends. Frank and Barbara Milliken showed up. It was a merry evening. I was grateful to Pam for going to the trouble.

#### Senior Vice President, Technology

Joklik: My job in Salt Lake was senior vice president, Technology of the newly formed Kennecott Minerals Company. Technology embraced Engineering, Procurement and Construction, Exploration, and Development of new projects. These responsibilities gave me a broad view of Kennecott's mining and minerals processing operations.

Swent: What was KMC's relationship with Kennecott?

Joklik: It was the major component of Kennecott. I took up residence in Salt Lake in May of 1979 and spent the summer in the Little America Hotel, which is a pleasant place to stay. The family was still in Connecticut enjoying the summer. The kids were heavily into swim team competition and anxious to do their part for the Tokeneke Club. They came to Salt Lake in September.

Strengthening Kennecott's Engineering Capability

Joklik: During that summer, I worked closely with Glenn Bakken and analyzed Kennecott's operations. I wasn't able to put into practice the conclusions I came to until early the following year, when I became president. A failing that impressed me was Kennecott's history of misadventures with major capital projects. When I looked back through the record, I saw that almost all projects costing over \$5 million had over-run substantially, in terms of money and time. More ominously, the facilities that resulted from such expenditures generally failed to perform according to expectations. They didn't do the job they were designed and built for.

Swent: And nobody had been evaluating these?

Joklik: Kennecott had a central engineering group headquartered in a building on the University of Utah campus. There was also a "research group." Each of these groups was staffed by about fifty professionals. I believe the poor performance on projects was caused by the hiatus between these groups, based in Salt Lake, and headquarters which had by then migrated from 42nd Street in Manhattan to a new office building in Stamford, Connecticut. The engineering and research groups, which were charged with conceptualization, preliminary engineering and design, tended to enhance projects beyond their potential, to facilitate selling them to headquarters. Cost estimates were squeezed, schedules curtailed and performance expectations exaggerated. At headquarters there was no one who could tell whether they were getting a snow job or not. Generally, that's what they got, and the more they balked at dispensing funds for capital projects, the more the projects were dressed up for presentation at headquarters.

I took a hard look at proposed projects in light of my experience with Mount Newman, Kimberley bauxite, North Carolina Phosphate, and Questa. I had worked on these projects closely with engineering, procurement and construction contractors and had developed a feel for the techniques and methodologies employed. I analyzed capital and operating cost estimates to determine whether they contained shortcuts or were over-loaded.

My intention was to make the central engineering group not just a service organization, but a line function whereby major capital projects--by "major", I mean over \$5 million--would be turned over to them. Project implementation, completion and transfer to the operating divisions would be the responsibility of this new engineering and construction group. Post-completion

reviews would measure their performance. I needed someone who was a good engineer and had also run major projects. Such people are extremely rare. You get excellent engineers who worked for engineering companies; you get excellent construction stiffs who worked for construction contractors; and rarely do you get a person who can do both.

After a prolonged search, I hired a man I'd already known for some time in connection with projects I'd worked on. He was Raman Rao, a senior project manager with Bechtel. He'd worked for sixteen years with Bechtel on project engineering and supervision of construction projects. Raman grew up in India, and had a graduate engineering degree from Stanford. He came on board and brought with him a handful of professionals from the construction industry. One was Dennis Connell, who eventually succeeded him. He also brought in a couple of experienced cost estimators, a function in which Kennecott had been almost totally lacking.

In the years since then, during which we built projects with a total value in excess of a billion dollars, there wasn't one that didn't come in within budget, ahead of schedule and exceeded the performance criteria.

#### Reasons for Kennecott's Lack of Competitiveness

Joklik: About the time Raman Rao signed on, I had a survey done of the production costs of our competitors which confirmed what you could read in the press, that Kennecott was possibly the highest-cost major domestic producer of copper.

Swent: And that's this figure on page 49 of David Morris's report?

Joklik: Yes. Dave Morris was manager of planning at Kennecott. His report was started when Bob Wilson, who is now chief executive of RTZ, said he would like a record of the cost reduction measures undertaken by Kennecott in the 1980s. I set Dave to work, and we agreed on an outline. His report was entitled "*Digging Out: Kennecott Resurfaces in an Era of Global Competition*". It's available to readers of this oral history.

Now, the reasons for Kennecott's lack of competitiveness were two-fold: some were within management's control; others were not. There had been sharp escalation of unit costs of production, partly because of the oil shocks of the seventies. The first shock came in 1973 and contributed to Kennecott's poor

profitability for the remainder of the seventies. The second occurred in '79 and caused further escalation of fuel costs.

### **Labor Contracts Mismanaged**

Joklik: Another reason for rapid cost escalation at Kennecott was the way labor contracts were negotiated, or failed to be negotiated. Contracts expired every three years, and every time management went through the same ritual. There was a lot of sabre-rattling, originating from headquarters and transmitted to the operating divisions. The party line was always: "This time we'll get 'em!"

Of course, the unions were accustomed to this ploy and they'd put demands on the table that were outlandish. The result was that the deadline would come, usually on June 30th at midnight, with the two sides still far apart. They hadn't got serious about negotiating yet.

Then the hourly people would take a vacation and start thinking of the hunting season in the fall, after which, finally, they'd consider going back to work. Management, on the other hand, would maintain a hard line. Perhaps posturing for the shareholders was involved. On average, you'd have a strike that ran for three months. The record shows that over a period of twenty-five years there was a strike every time the contract expired. An average of a month a year was wasted, which was costly in terms of lost copper production and hurt the pay packets of the union members.

Swent: Now, Kennecott was not alone in this. It was an industry-wide problem, wasn't it?

Joklik: It was. But I think Kennecott probably carried it further than some of the competitors. I'll get back to labor relations later, but I'm discussing why it was that Kennecott, back in 1980, was not competitive. Labor costs certainly were within management's control, but had not been addressed.

### **Poor Maintenance of Antiquated Facilities**

Joklik: Another reason for lack of competitiveness was poor maintenance of antiquated facilities. There had been distractions resulting from attempts to diversify. When I came back to New York from Canada,



the Okonite case, on which I worked, took a lot of management time. The Peabody acquisition and divestiture was a major misadventure. The acquisition of Carborundum turned sour because Carborundum was dressed up for the kill. Then you had the Curtiss-Wright takeover battle because their chairman, Roland Berner, recognized the extent to which Kennecott had been weakened. He knew that the Carborundum acquisition had done nothing to improve Kennecott shareholder values. Of course, Berner was unpopular with Kennecott management, as personified by Tom Barrow and Bill Wendell, the former chairman of Carborundum.

[Interview 4: January 21, 1994] ##

Joklik: I wasn't familiar with Kennecott's strategy to counter Roland Berner's attack, and I certainly wasn't party to using the \$160 million proceeds from the sale of North Carolina Phosphate for buying Dorr Oliver, at an inflated price, as part of the settlement with Curtiss-Wright. But I did get to know Berner. In fact, I was encouraged by Tom Barrow and others to spend time with him to try and convince him that we did have a long-range plan for our mining operations.

At one of our board meetings, I believe it was in Phoenix, Pam and I were out on the tennis court with Berner. I always thought that a person's behavior in competitive sports gave a clue to their character. Well, Berner was a good tennis player. More than that, on the tennis court he was a thorough gentleman. After reporting this to my superiors, I was no longer encouraged to spend time with Berner.

Distractions such as these diminished management's attention to supervising, running and maintaining the copper mines. Money came to be increasingly short as misadventures with diversification siphoned off corporate financial resources and made it more and more difficult for the operating people to obtain funds for maintaining and, more importantly, improving their facilities. In absolute terms, therefore, and in relation to their competitors, the mining, beneficiation, smelting and refining facilities of Kennecott's operations became higher-cost, as their maintenance was neglected and their renovation did not keep pace with advances in technology.



### Environmental Catch-Up

Swent: In the seventies you also had the environmental movement. The whole EPA thing was coming in, too.

Joklik: You're right. It began with the Clean Air Act of 1970. Kennecott's response was illustrated by the Utah Copper smelter project. To meet the ambient air standards mandated by the Clean Air Act, the smelting technology was changed by installing Noranda reactors. The old Peirce-Smith converters were left in place, although they weren't matched properly with the Noranda reactors. There was expectation that the Noranda reactors could perform as a single-vessel operation, whereby smelting and converting would be done in the same vessel. That's what Noranda had done at their Horne smelter. But what they didn't have were the environmental restrictions we had to operate under. Single-vessel operation soon proved to be non-attainable. The project cost \$300 million.

I found out all of this after coming to Salt Lake and reviewing the records. Apparently expenditure limits were imposed by headquarters. The response of the contractor, who was not closely supervised by the Central Engineering Group, was to eliminate items from the scope and take short cuts. Where ancillary facilities needed replacement to go with the new smelting vessels, the old junk was left in place.

Swent: And some of it was very old.

Joklik: Yes.

Swent: Early part of the century, really, wasn't it?

Joklik: That's right. So, this was a partial retrofit which, initially, had the effect of bringing the facilities into compliance with the Clean Air Act. Utah Copper was the first smelter in the United States to come into compliance, but the plant deteriorated rapidly from the date the project was completed. It was evident to local management and to the operators that a shoddy job had been done. They therefore had little incentive to pay attention to housekeeping. The working area was poorly lit. Operators would trip over themselves trying to get around. A new lighting system had been cut from the scope. The air in the smelter building was contaminated, because the hooding necessary to provide for clean air in the workplace had also been cut. The operators didn't relish being in that atmosphere.

### Poor Work Ethic

Joklik: I already mentioned the construction of a 1300-foot stack to disperse the off-gasses. The EPA had put out regulations saying, "Thou shalt not meet ambient air standards by propelling pollutants into the atmosphere." That stack was a dinosaur, figuratively, from the day it was completed. The project did not achieve what it was intended to do. I've responded because you mentioned environmental aspects, Lee. I would say, by and large, environmental consciousness was not acute. Sure, this project was done, but the Utah Copper property was not subjected to the kind of scrutiny it should have been to head off future environmental problems.

Another reason for Kennecott's high costs was that productivity was poor on account of the few minutes in each hour worked. When I first toured the smelter after coming out here, I was astounded to see the refuges where people on day shift, afternoon shift or night shift could disappear to; refuges that were outfitted with chairs and mattresses. These weren't the crib rooms. These were just out-of-the-way places where it was accepted that supervisors wouldn't look. People on shift would just crawl in there and have themselves a good nap.

Here's a related experience. We bought a house in the St. Mary's area of Salt Lake, just behind the zoo--as I always say, "Not in the zoo, but behind the zoo." This house had redwood hoarding along the front to contain the yard. We decided to replace it with a stone wall. We were recommended to a contractor. It turned out that he was a Kennecott employee, a nice, elderly, energetic man. He was a topnotch stone mason. There was no question about that. He built us a wall that became a nice feature of the property, and he worked hard. I got to know him. He said he worked on night shift at one of the concentrators. I asked, "How do you keep going with your job at night and working as hard as you do in the daytime?"

He said, "Oh, I get plenty of rest out at Kennecott." He told me on his eight-hour shift, for one hour, maybe one and a half, work had to be done, but the rest of the time he'd sleep. And he said, "There are dozens, there's hundreds of guys just like me." In time, as we became better acquainted in town, we found that other people had similar stories; that the trick was to get on night shift at Kennecott.

### Lax Purchasing Practices

Joklik: We found that in making purchases in town, you know, hardware for the house, or whatever, I'd go into a store and when they learned I was with Kennecott, they'd say, "Oh, yeah [lowering his voice]. We have a special price; a special price for Kennecott." It didn't take me long to discover that, by and large, the Kennecott price exceeded the regular price! [laughing] You could extrapolate that to the purchasing practices of the company. It turned out that little effort was being made to obtain volume discounts. While competitive bidding wasn't widely practiced, the "traditional" suppliers were cleaning up.

### Declining Ore Grades, Increased Stripping, Longer Hauls

Joklik: Some cost factors were beyond the control of company management. One was that the open pits were getting deeper and, therefore, hauls were becoming longer and steeper. Ore grades were declining at the properties, particularly as the last vestiges of secondarily enriched ore were being exhausted. All the properties were mining increasing proportions of primary ore.

Although stripping ratios were increasing, I found that stripping was being done with an unrealistic view to the future. Material was being stripped to ultimately expose rock that had little chance of ever being economic.

At Utah Copper, I was delighted to meet the man in charge of mine planning, Rod Davey. He is one of the brightest people I've ever had the pleasure of working with. Our first meeting was a little rough. I asked him some questions and concluded that his answers, especially when there were people around, were designed to indicate how stupid my question was. Fortunately, he realized that I was aware of this and changed his attitude.

Rod was able to explain to me the mine planning system, both the longer term plans going out five, ten, and fifteen years, and the yearly and monthly production plans. I found that he was doing an excellent job but getting inappropriate direction from his superiors.

Before changing the subject, I should say that some years later, we put Rod into pit operations. He took to that like a duck to water. He became mine manager and ultimately, general

manager of Utah Copper. In my view, he was the best Utah Copper had ever had.

Swent: Let me just ask one question. Now, you were talking about the stripping ratios, and so on. Was this true of the Chino and Ray properties, as well as Utah Copper?

Joklik: By and large, yes. You know, I don't want to draw analogies too closely, but they all were so hierarchically structured that it was difficult for the guys on the job to attract attention when they saw something going wrong.

#### Promotion without Merit

Joklik: There was a policy of filling supervisory positions through promotions by "going through the chairs". I was surprised to discover that many of the managers had no technical training at all! They did not have engineering degrees. There were a few who had degrees in, say, history or English. But because they'd been there "long enough," they were regarded as qualified for promotion. They'd been "through the chairs." Once they'd been there for ten or fifteen years, they ought to be managers! "So, let's make them managers."

While I was still senior vice president Technology, I made it clear in the Engineering and Research Groups, and in Exploration, that the criterion for promotion was ability: technical ability and the ability to manage people.

In time, I became critical of many front-line supervisors. Some of them had graduated from the union ranks and, as soon as they became supervisors, they developed into little tyrants in their work place. Their lack of qualifications was so evident to the hourlylies that they disregarded them. These guys had no authority; they did not have respect from the people who were supposed to be working for them.

Swent: It sounds as if the union leadership wasn't very lively, either.

Joklik: The union leadership came alive with their grievances--constant grievances about the most picky things--and they came alive before contract time to draw up lists of unconscionable demands.

Swent: I was thinking about some of these things that you've mentioned. I would think that the unions might have complained about issues such as the poor lighting in the plant.

Joklik: You would think so, but the safety record of the operations was poor.

Swent: Because that would be a legitimate thing for the unions to advance.

Joklik: Sure, but they were more concerned with perks, with time for meals and travel time.

Another problem was the structure of the organization. There were levels in the organization where you had almost one-on-one reporting. If I saw something at one of the operations that I wanted information on, and contacted the senior vice president, Operations, or the general manager, then some considerable time later I'd get a memo written by some guy five or six levels down, together with four or five one-line covering memos.

They had recently built an attractive Operations Management building out by Copperton. It was an expensive building, but parts of it leaked badly. Maintaining it was a problem. This building housed only the mine management. The Utah Copper Division management was in the Kennecott Building, on the corner of Main Street and South Temple in Salt Lake City. This is where the management of Utah Copper was, twenty miles from the operations. We took care of that situation by moving the mine management into trailers on the edge of the pit. And we put the Utah Copper Division management out in the building where just the mine management had been. The managers were then obliged to communicate with the operators.







Family outing near Vienna, 1937. Left to right: G. Frank Joklik, Karl Friedrich Joklik (father), Helene Giessl Joklik (mother), Wolfgang Karl Joklik (brother).







Cranbrook School track team, 1943. G. Frank Joklik, top row, fourth from left.



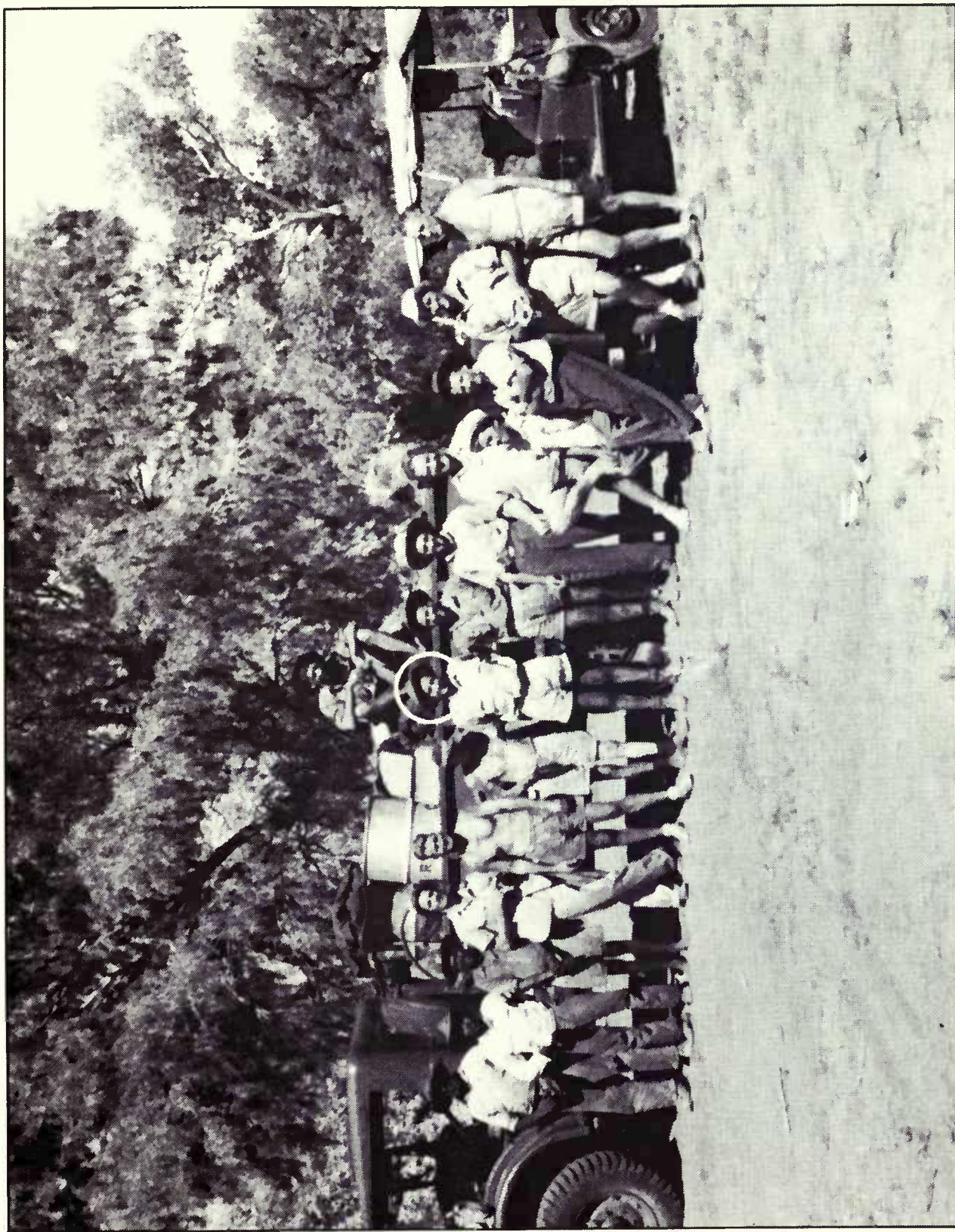




Cranbrook School prefects, 1944. G. Frank Joklik, top row, center.



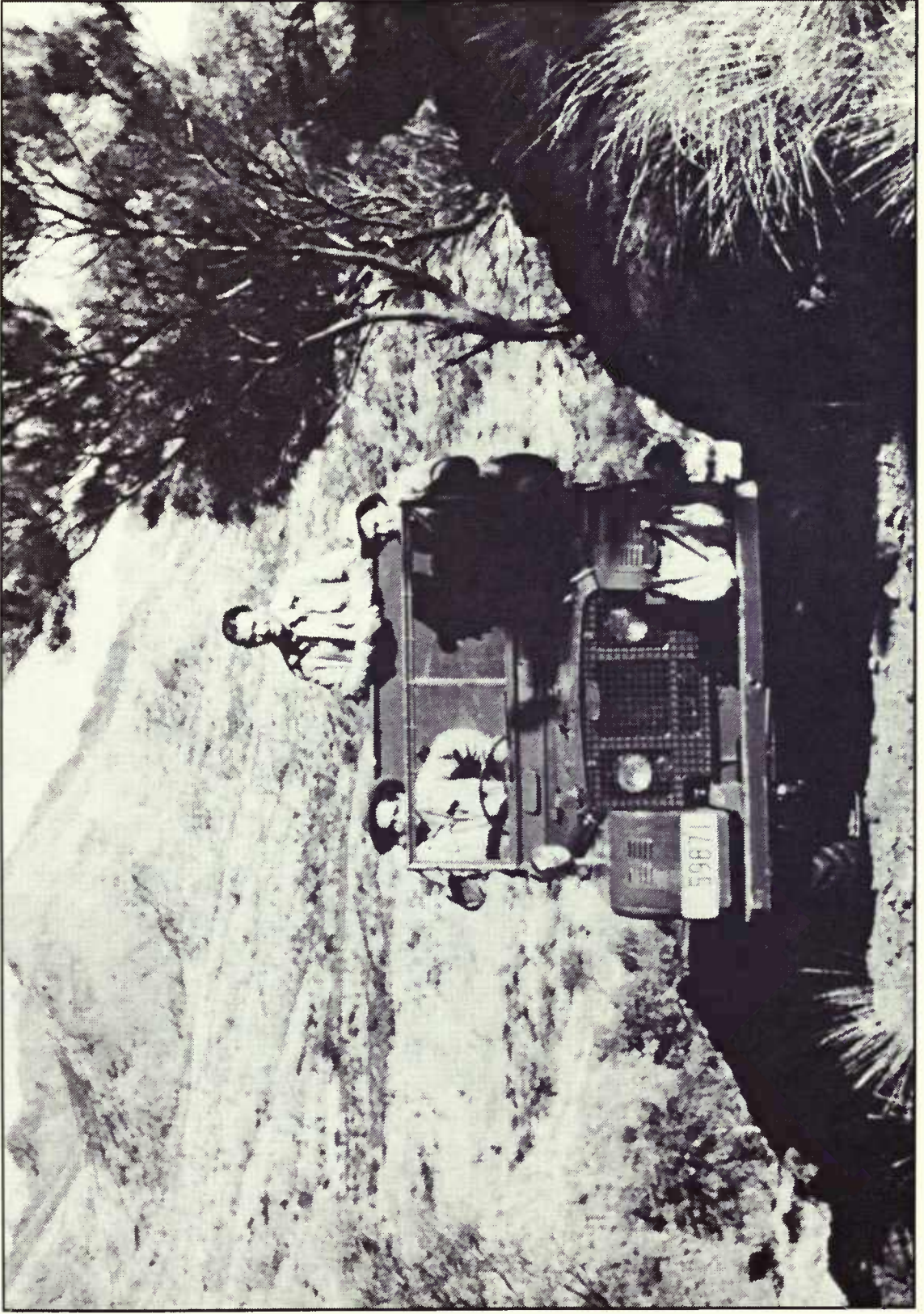




Lasseter's Reef Expedition at Finke River Crossing, 1951. G. Frank Joklik, center, circled; Burge Brown on Joklik's left.







Climbing Mt. Palmer, Harts Range, 1951. With John Sullivan (standing) and Bruce Walpole.







Line cutting crew, Gaspé Peninsula, 1955. G. Frank Joklik, lower right.





G. Frank Joklik claim staking, Lake Lessard, Québec, 1956.







Eskimo crew at Fort Chimo, 1957.







Unloading a Beaver aircraft at Esker Lake, Ungava, 1957. Left to right: G. Frank Joklik, Terence English.





G. Frank Joklik and Pamela Mary (Fenton) Joklik cutting the wedding cake at Farncombe House, Cotswolds, 1962.







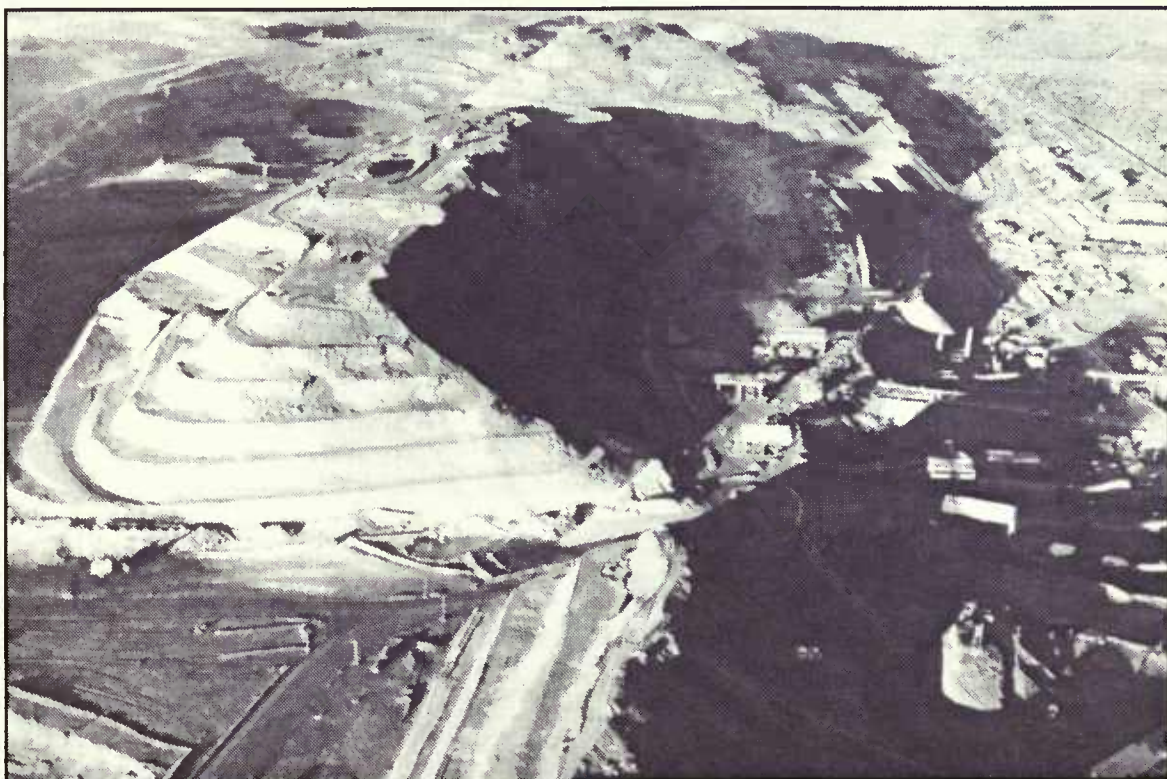
AMAX and Japanese steel industry representatives at Mt. Newman, 1964. Far left, Ed Douglas and Bryan Summers. Far right, Stan Hilditch. G. Frank Joklik, circled; Ken Malcolm on Joklik's right.







Above: Mt. Whaleback iron ore deposit, 1964. Below: Mt. Whaleback minus 500 million tons of iron ore, 1988.









G. Frank Joklik explaining model of Bingham Canyon Mine to SOHIO board visitors, 1981. Ivor Pickering on far left.







President Ronald W. Reagan: cordial but not supportive of Kennecott's trade initiatives, 1987.







G. Frank Joklik (left at microphone) addressing union leaders at 1981 meeting.







G. Frank Joklik, Kennecott President, at commencement of 1986 labor negotiations.





G. Frank Joklik, center, planning Utah Copper modernization with Bob Dimock (left) and Raman Rao (right), 1984.



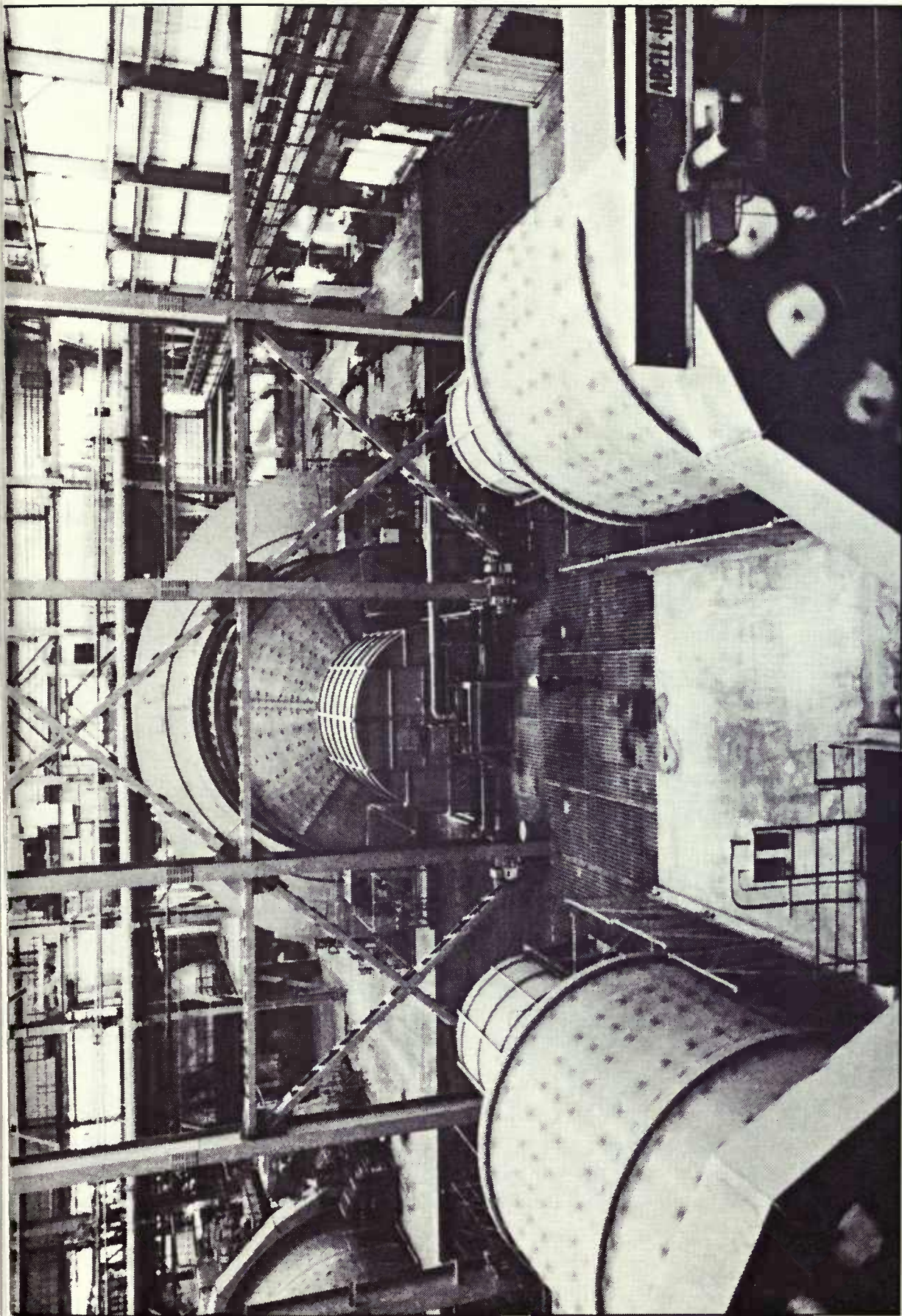




Utah Copper modernization opening, 1988. Left to right: Bob Horton, Governor Bangerter, G. Frank Joklik, Patrick Gillam.



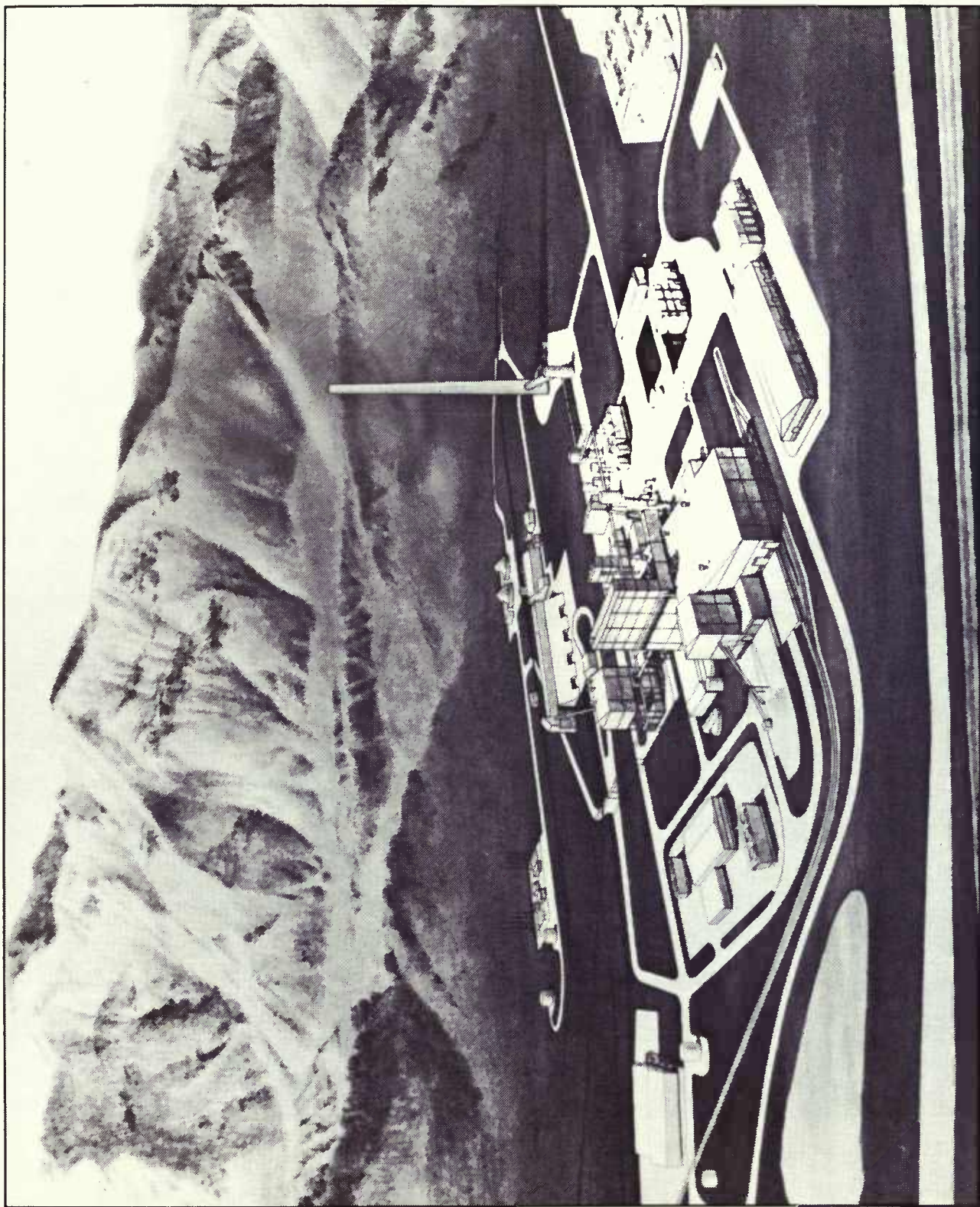




Fourth line at Copperton Concentrator, 1992. New 36-foot diameter SAG mill (top) dwarfs worker (center). Two new ball mills in foreground.







Artist's drawing of new Utah Copper Smelter, 1991.







President George H. W. Bush supports Kennecott's resistance to Superfund listing, 1992. Pam Joklik, center; G. Frank Joklik, right.





Senator Orrin Hatch (right) tells one on Senator Jake Garn, to the Jokliks' amusement, 1992. G. Frank Joklik, center left; Pam Joklik, center right.







Rod Davey (left) and G. Frank Joklik (right) in front of new Bingham Canyon Mine primary crusher control room, 1990.



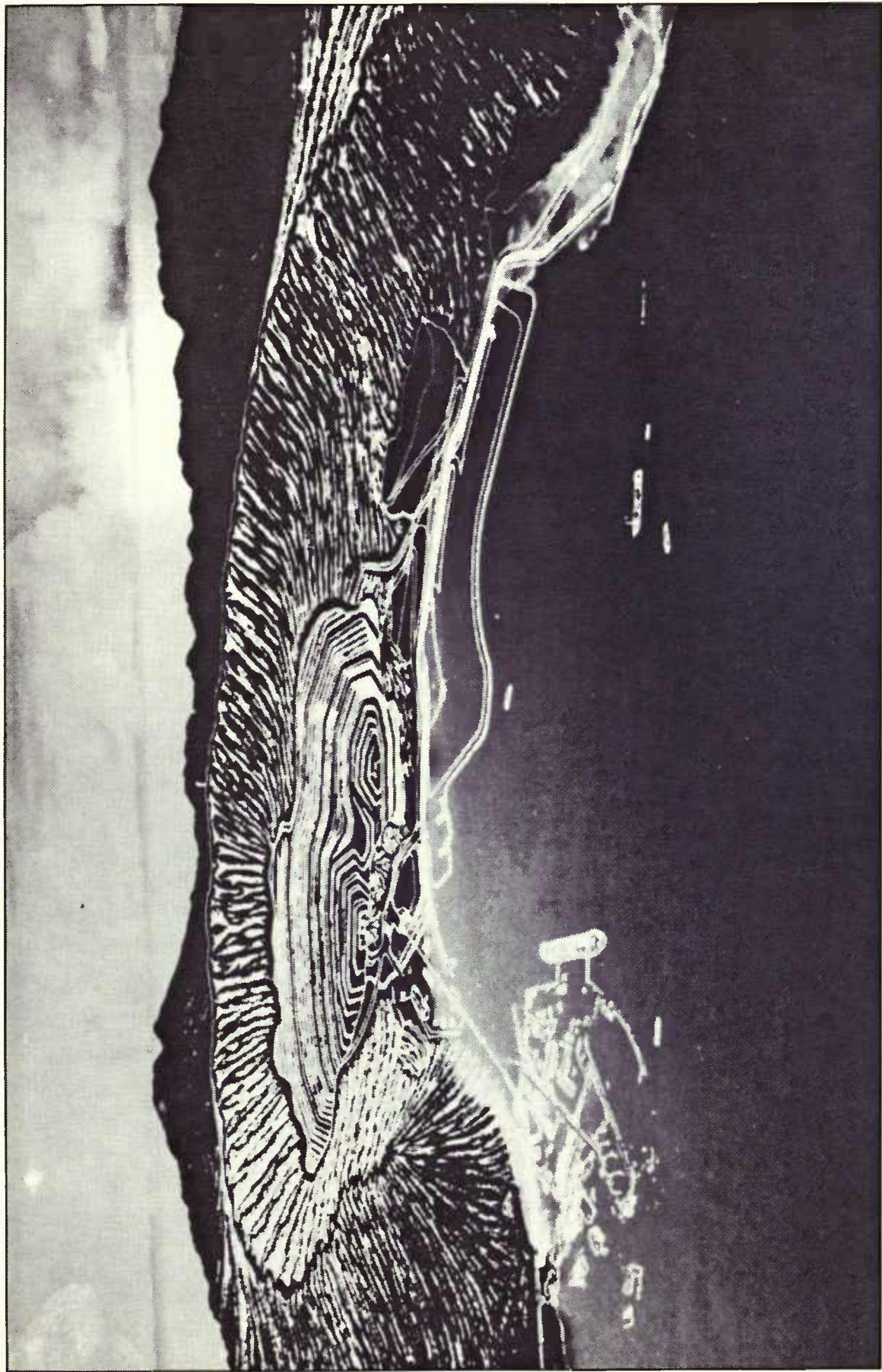




Gavin Thomas (left) and G. Frank Joklik (right) at hot springs adjacent to Lienetz orebody, Lihir Island, 1983.







Lihir Island, with artist's drawing of gold mining operation superimposed, 1993.







Katie Joklik's twenty-first birthday, 1987. Left to right: G. Frank Joklik, Katie Joklik, Wolfgang "Bill" Joklik.







G. Frank Joklik, director of First Security Corporation, 1984.





"People of Vision" dinner, Salt Lake City, 1992. Left to right: Paul Joklik, Pam Joklik, G. Frank Joklik, Katie Joklik, Carl Joklik.

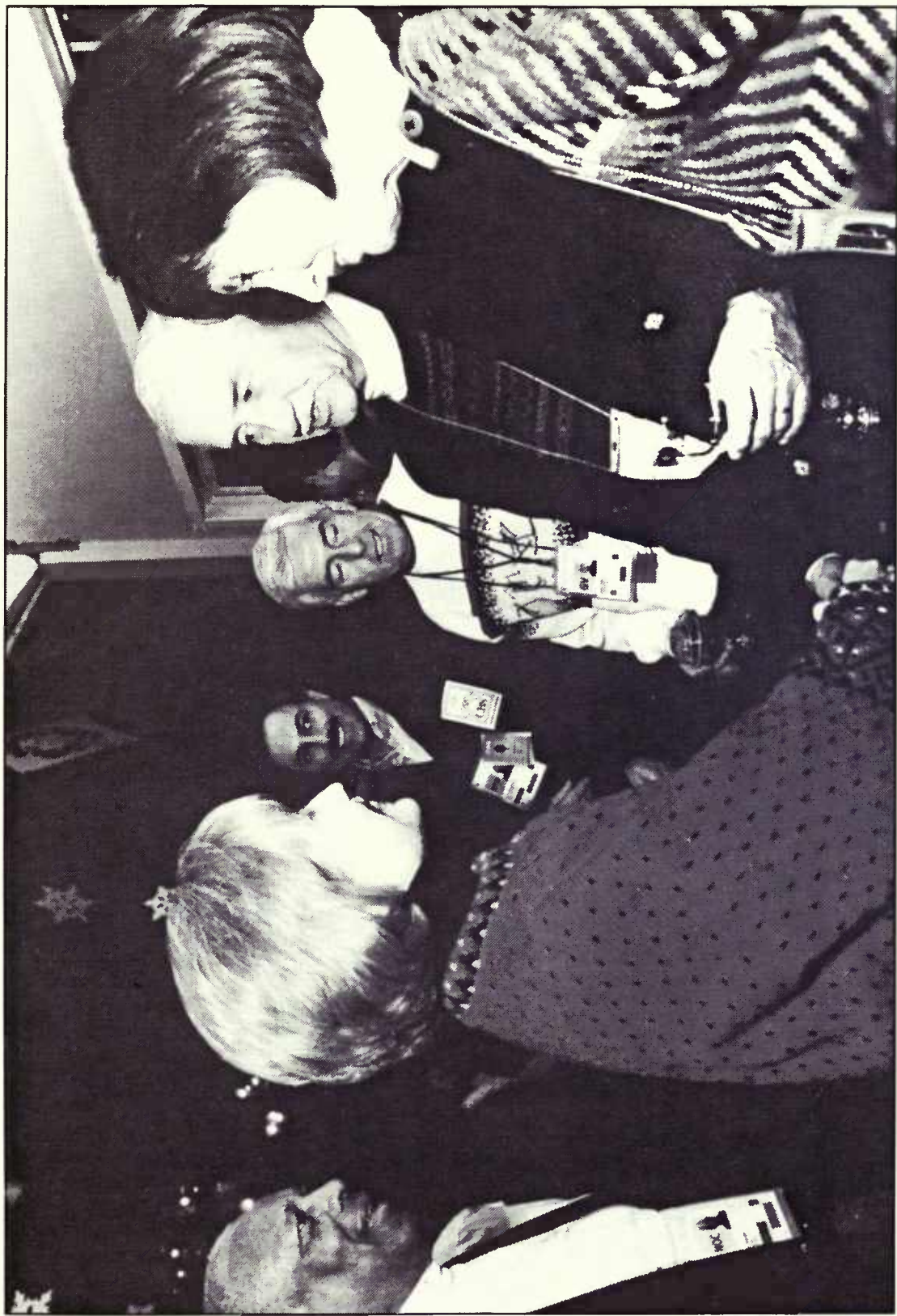






G. Frank Joklik running gates at Snowbird, 1987.

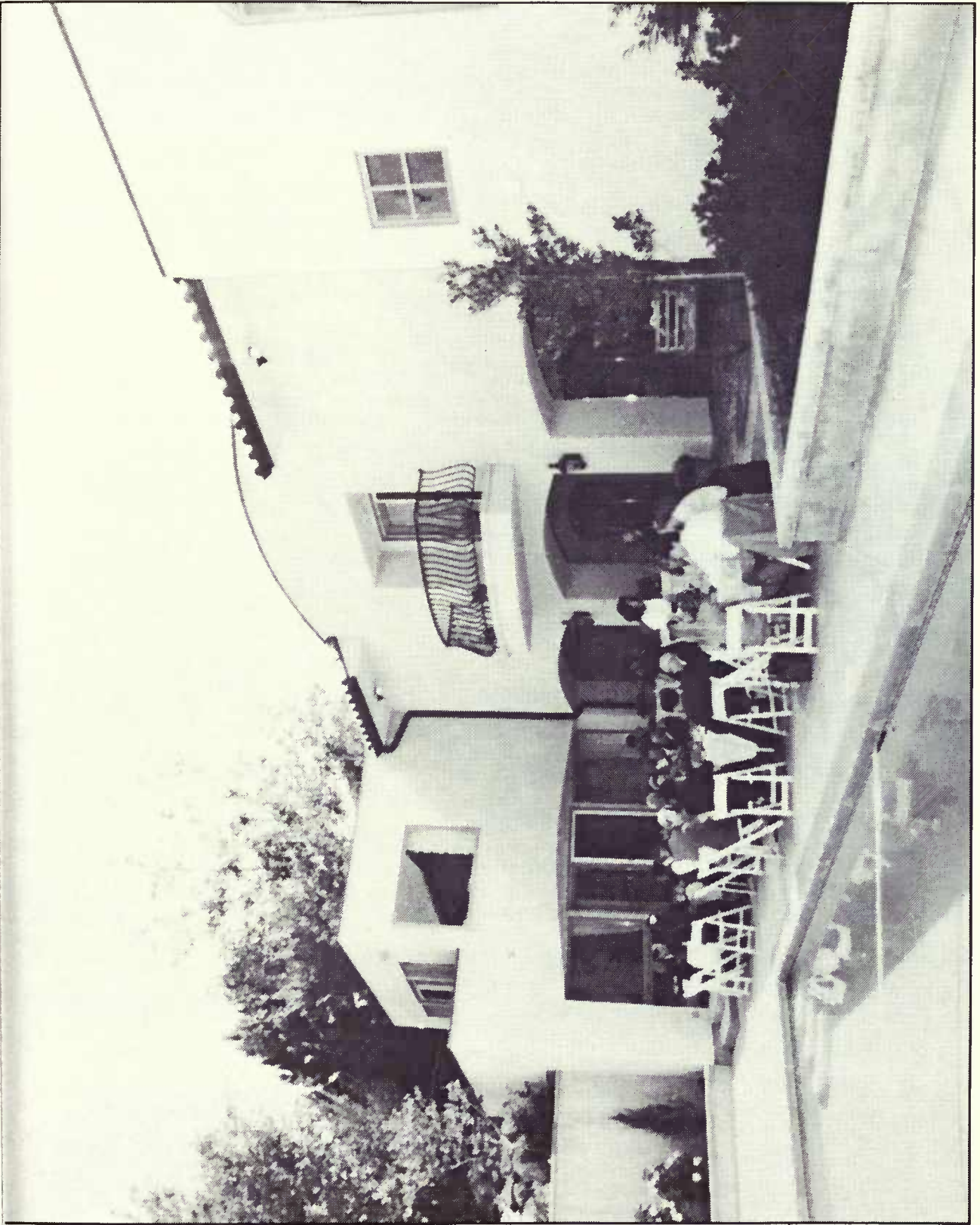




Lillehammer Winter Olympics, 1994. Foreground, left to right: USOC President Dr. Leroy Walker, First Lady Hillary Rodham Clinton, G. Frank Joklik, Pam Joklik.







Entertaining IOC Site Selection Commission at home, 1994.





G. Frank Joklik briefing Vice President Al Gore, 1994. At left, Tom Welch and Dave Johnson.







Rainbow Bridge, Lake Powell, 1995. Left to right: Ashwini Kumar, IOC member from India; Tom Welch; Ambassador Guirandou-N'Diaye, IOC member from Ivory Coast; Pam Joklik; G. Frank Joklik.







World Cup Opening, Park City, 1995. Left to right: International Ski Federation President Marc Hodler, G. Frank Joklik, Pam Joklik, and Dave Johnson.

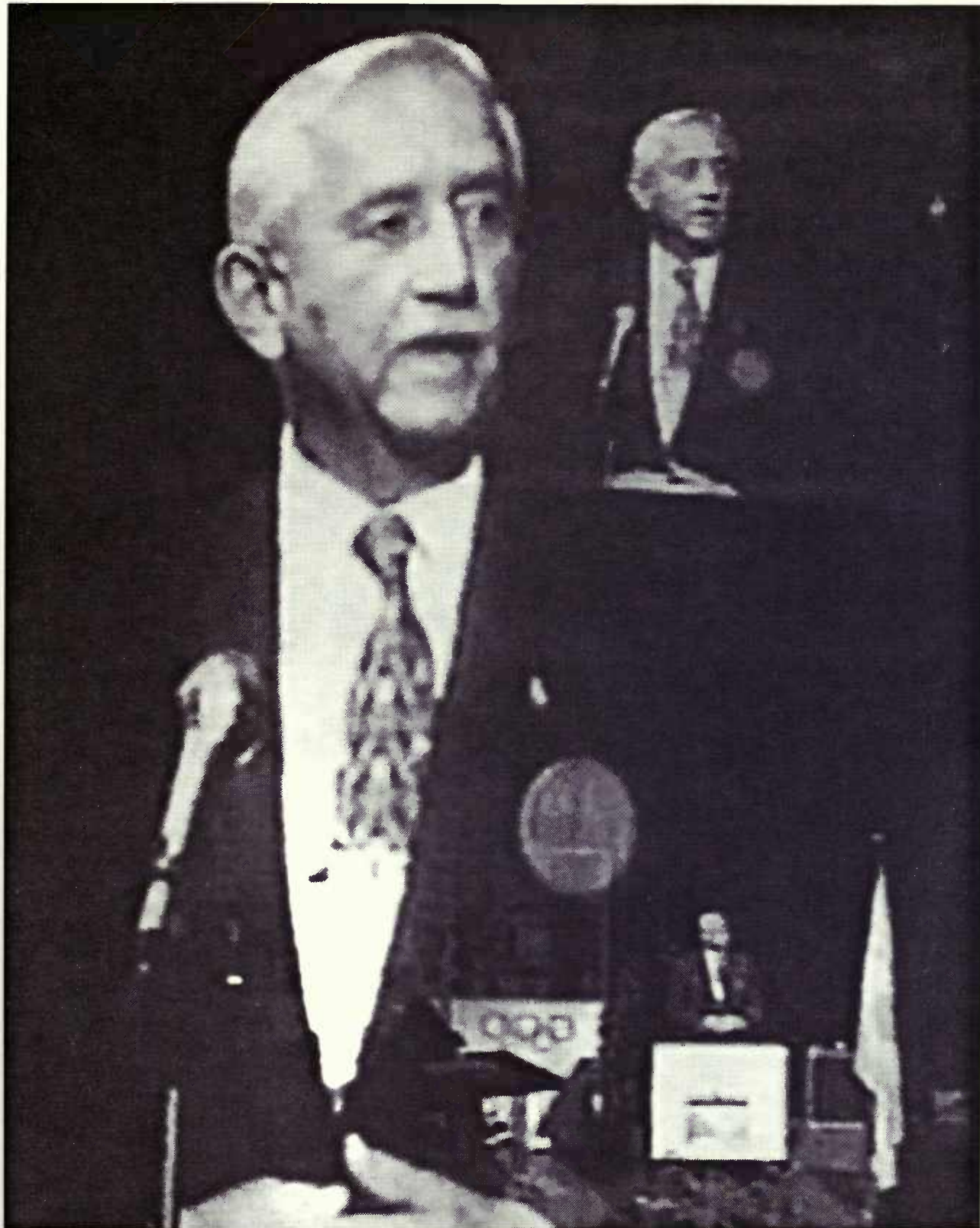






Dinner at home, 1995. G. Frank Joklik presenting to Valeriy Borzov a book with photo of his 1972 Olympic Gold medal win in 100-meter final.





Salt Lake Bid Committee Chairman G. Frank Joklik addressing IOC Plenary Session, Budapest, June 16, 1995. (Photo is taken from a video of the event.)







G. Frank Joklik receiving telephone congratulations from President Bill Clinton, Budapest, June 16, 1995. At left: Governor Mike Leavitt.







G. Frank Joklik greeting the crowd at Salt Lake City and County Building on June 17, 1995. At left, Snow Basin owner Earl Holding, and World Cup Downhill champion Picabo Street. At right, figure skater Cynthia Ruiz, Mayor DeeDee Corradini, and Tom Welch.







IOC President Juan Antonio Samaranch, left, with G. Frank Joklik, Salt Lake Organizing Committee Chairman, at IOC Executive Board meeting, Lausanne, 1996.





Kyrgyz Republic Mining Company President Dastan Sarygulov, left, presents painting of Lake Issyk-kul to MK Gold President G. Frank Joklik, right, in presence of Leucadia Chairman Ian Cumming, center, 1995.







Left to right: Randy Dryer, Chairman, Utah Sports Authority; G. Frank Joklik; Tom Welch, President, Salt Lake Olympic Committee, after sliding bobsled track at Utah Winter Sports Park on Opening Day, January, 1997.



## VII KENNECOTT PHASE THREE--PRESIDENT, 1980-1993

Joklik: I've tried to set the stage to show what we were facing and what we found in the first few months here in Salt Lake City. Then came the momentous day, which I think was the 12th of February, 1980, when Glenn Bakken called me to his office and told me that he was being transferred to Stamford as president of Kennecott reporting to Tom Barrow, and that he wanted me to succeed him as president of Kennecott Minerals Company.

It didn't take me long to think that one over. Glenn and I went back to Stamford and met with Tom Barrow, who confirmed my appointment.

When we left Connecticut, we did not sell our house there. We did not want to make the same mistake we made when we left California. We kept our stone house. When Barrow asked, "Did you sell your house in Connecticut?" I said, "No." He said, "Well, that's good. You'll probably be back here before long." Well, we'll see what did happen.

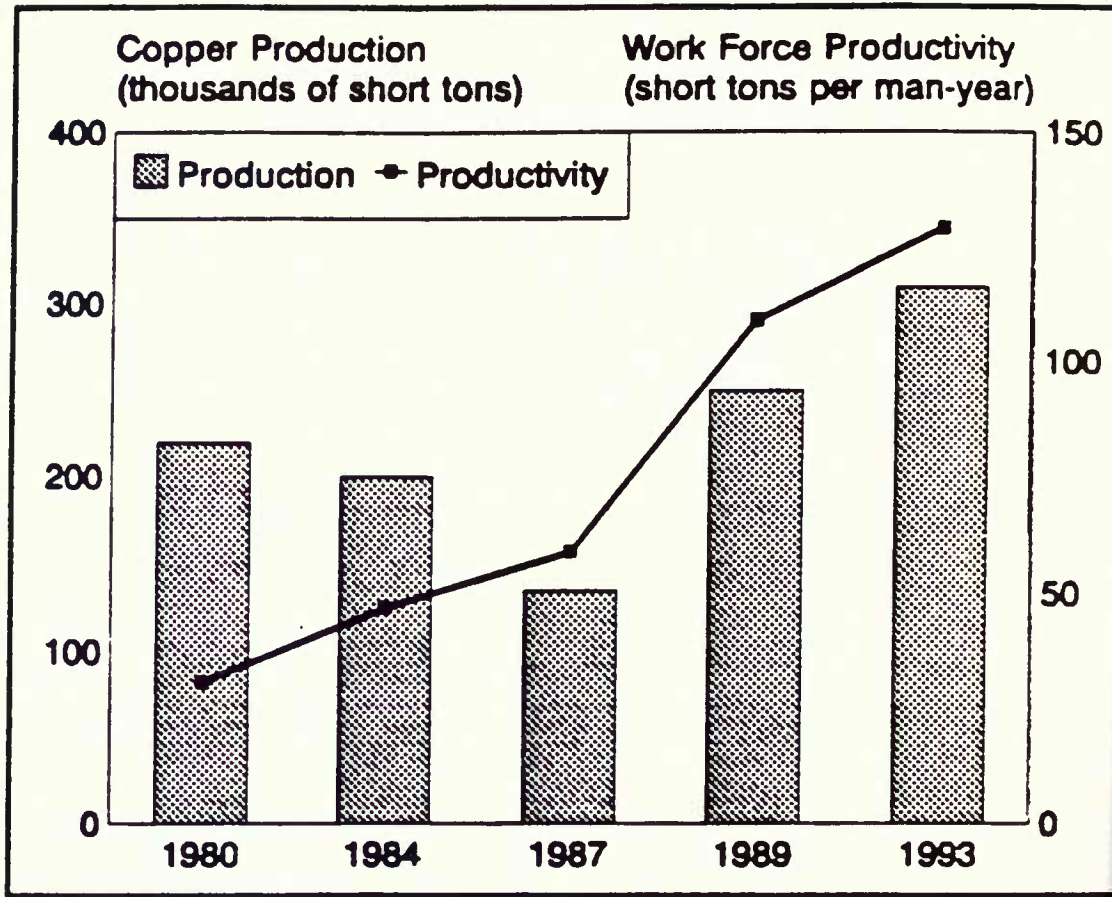
Of course, the scope of my activities changed from that day on.

### The Need for Cost Reduction ##

Swent: What caused you to immediately put such strong emphasis on cost reduction at Kennecott's operations? Let's get kind of oriented to '74. .

Joklik: It was obvious that something had to be done about Kennecott's relatively high cost position which we've just discussed. Also, my experience with bulk commodity projects in iron ore, bauxite





Copper production and work force productivity at  
Utah Copper.

and phosphate had taught me the vital importance of being a low-cost producer.

You knew that if you weren't a low-cost producer, you couldn't ride out the down-turns and continue to be a reliable supplier. You'd be out of business. Emphasis on "reliable" was a lesson I had learned in Japan.

Now, let me make one thing clear. At the time I took over, Kennecott was making good money.

Swent: Which was what had enabled them to get by with this.

Joklik: Well, they hadn't been very profitable during the latter part of the seventies, but there was an up-tick in prices in 1980 and '81. I believe Kennecott's operating profit was well in excess of \$100 million. When I went to the monthly review meetings, the heads of the Carborundum divisions joked about how Joklik didn't have to worry about costs because he was making money hand over fist. The mining operations were not under pressure to reduce costs. But, beyond the realization that Kennecott's costs were out of line, what motivated me was the international picture. I'm referring to the passing of the copper industry from "a few safe hands," into control by Third-World governments.

Swent: There was something called CIPEC that came into this someplace.

### Third-World Over-Production

Joklik: Yes. CIPEC was formed when Codelco inherited the former Kennecott and Anaconda operations in Chile and the ownership of African copper production passed from Anglo-American and Selection Trust to government-controlled organizations.<sup>1</sup>

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<sup>1</sup>Robert M. Haldeman, Managing Copper Mines in Chile: Braden, CODELCO, Minerec, Pudahuel; Developing Controlled Bacterial Leaching of Copper from Sulfide Ores; 1941-1993, Regional Oral History Office, University of California, Berkeley, 1996.

William Humphrey, Mining Operations and Engineering Executive for Anaconda, Newmont, Homestake, 1950 to 1995, Regional Oral History Office, University of California, Berkeley, 1996.

Vincent D. Perry, A Half Century as Mining and Exploration Geologist with the Anaconda Company, Regional Oral History Office, University of California, Berkeley, 1991.

These newcomers were not going to cut production because they didn't want idled people marching on the palace. The operations in Africa and South America employed more people than was necessary, for social reasons that had nothing to do with economics.

Meanwhile, the major importers of copper in Europe and Japan were encouraging expansions of production for two reasons. First, they wanted to intensify competition among their suppliers. Second, they believed their own over-optimistic forecasts of demand.

All of this was foreseeable in '79 and '80 if you sat down with the industry data and you'd been around long enough to witness the cyclical nature of the metals business. In my writings I tried to prove that the next glut would be protracted.

I remember being in New York and riding with Frank Milliken to see Peter Grace in his office. Frank asked me, "Do you think this Third World production is going to cause a permanent reduction of copper prices?" I said, "No. I think this business will always be cyclical. It depends on the world economy and human nature. But I think the next dip is going to be deep and long." Such thoughts spurred me on in February of 1980 to immediately get to work on cost reduction.

Swent: You were talking with other people in the copper industry--people at Phelps Dodge, say, or Anaconda. Was there any industry communication about these things?

Joklik: No. There wasn't. Everybody was so conscious of anti-trust legislation that to talk about the future with people from other companies was considered unwise.

Swent: The American Mining Congress?

### Declining Intensity of Use

Joklik: Oh, we went to AMC meetings, but we didn't talk about the outlook for copper markets. In fact, we left the room if anyone started talking about that sort of thing. One other factor to consider in

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John Reed, Pioneer in Applied Rock Mechanics, Braden Mine, Chile, 1944-1950; St. Joseph Lead Company, 1955-1960; Colorado School of Mines, 1960-1972, Regional Oral History Office, University of California, Berkeley, 1993.

this longer term outlook for copper was something I had spent time studying--and that was intensity of use, i.e., copper consumption per unit of gross national product. It was clear that the rate of growth of copper consumption had taken a sharp down-turn almost immediately after the first oil price shock in 1973. During the period from 1966 to 1973, the Free World economy grew at a rate of 4.6 percent per year. The copper intensity of use declined at half a percent annually. So, if you subtract that half percent from 4.6 percent, you had an annual average growth rate of copper consumption of 4.1 percent. Now during the period from 1973 to 1979, the Free World economy grew at a rate of 3.2 percent per year, but copper intensity of use declined at a rate of 1.8 percent. Take 1.8 percent from 3.2 percent and you have net copper consumption growth of only 1.3 percent, compared with 4 percent previously.

Let me jump ahead a little. In the period from 1979 to 1987, the Free World economy grew at 2.3 percent, while copper intensity of use continued to decline at 1.8 percent, the result being copper consumption growth of only .5 percent. This was the business environment we were about to experience.

The reduced intensity of use was due to three factors: substitution, for example, by optic fibers in the communications industry; economization in the use of copper, such as thinner copper sheet in heat transfer mechanisms; and finally, the "shift to the service sector", at the expense of the manufacturing sector.

Swent: Was there much recycling?

Joklik: Recycling of copper has tended to be in the range of 25 percent to 28 percent of refined copper. You'd think in poor times more would be recycled, but the cost of collecting and processing doesn't decline.

Swent: So substitution was more effective than recycling.

Joklik: Yes. As a matter of fact, I had just given a talk on trends in the copper industry, including intensity of use, at a combined meeting of AMIC [Australian Mining Industry Council] and the U.S. and Australian Institutes of Mining and Metallurgy. I was on a panel with Sir Ian McClellan of BHP, Plato Malozemoff of Newmont<sup>1</sup>

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<sup>1</sup>Plato Malozemoff, A Life in Mining: Siberia to Chairman of Newmont Mining Corporation, 1909-1985, Regional Oral History Office, University of California, Berkeley, 1990.



and Jim Fouts, the chairman of Mount Isa Mines. That was in May of 1978. The meeting stimulated a valuable exchange of ideas.

### Deficiencies in Employees' Education

Joklik: Later, when I considered the relatively low productivity of our salaried work force, I wondered to what extent some of these people might be handicapped by deficiencies in their education.

Swent: I just happened to think, Utah has not had a school of mines, has it?

Joklik: No.

Swent: Their mining and metallurgical engineering has always been integrated with the university.

Joklik: That's right.

Swent: But you were thinking of secondary--

Joklik: I could see from written and oral communications with the people who were responsible to me that they had difficulty with organizing their thoughts in a logical manner, which handicapped them in defining problems and devising solutions. So I did a little research on educational standards and collaborated with David Gardner who was then president of the University of Utah.<sup>1</sup>

Swent: Subsequently California--

Joklik: Yes. He later became president of the University of California; he's now retired. David supplied me with details of his work as chairman of the President's Commission on "Excellence in Education." I also worked with Lester Thurow, from MIT, who was an expert on the relationship between education and productivity. I wrote a paper entitled "Education, the neglected factor in productivity" and presented it as the keynote speech at the AIME annual meeting in Dallas, in February of 1982. It raised the question to what extent productivity could be improved by raising standards of primary and secondary education, and thereby reducing the huge load of remedial education on the universities.

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<sup>1</sup>David Gardner, oral history in process, Regional Oral History Office, University of California, Berkeley, 1997.

Now, I've talked enough about the situation that faced me when I took the helm of Kennecott, in February of 1980.

### Three Corporate Strategic Goals

Joklik: The following month, I wrote a memorandum in which I defined three broad goals: first, reduction of production costs using existing facilities and equipment; second, investment in facilities and equipment that would yield maximum cost benefits; and third, discovery of opportunities for investment in new natural resource projects that would lessen Kennecott's dependence on the copper operations. Let's talk initially about the first of these--cost reduction without major investment of capital.

### Cost Reduction without Major Capital Investment

Joklik: I called together my first general managers' meeting in mid-March and addressed them about the grim outlook for copper markets and the prospective inability of our operations to compete.

Swent: There were six general managers at that time, Utah Copper; Chino, New Mexico; Ray, Arizona; Nevada Mines; KRC (Kennecott Refining Co.) in Maryland and Ozark Lead in Missouri.

Joklik: Right. The general managers were Wally Jensen at Utah, Dave Kinneberg at Chino, Ken Vance at Ray, George Allen at Nevada, Hop Ensign at KRC and the "Silver Fox," Harold Kruger, at Ozark.

Swent: All right. And you called them into Salt Lake. Did you have regular scheduled meetings with them?

Joklik: No. I'm not big on regular scheduled meetings. I've had to attend so many myself that I know how easy it is to tranquilize the audience by giving them historical data and dwelling on the obvious. We called meetings when necessary. For the rest, I wanted these people to get on with doing their jobs.

### Focus on Problems and Opportunities

Joklik: My limited knowledge of military history tells me that, when your forces are outnumbered, the last thing you want to do is spread them evenly across the battlefield. It's better to concentrate them where there is a chance of achieving a breakthrough, by attacking fiercely and giving the impression of being more powerful than you really are.

Similarly in conducting a business, it's necessary to concentrate on problems and opportunities, and not on business as usual. It never ceased to amaze me how much time our subsequent owners, Standard Oil and British Petroleum, spent on routine meetings that occupied 70 percent of the working time of their top management. Most of such meetings was occupied by discussing and reporting routine matters, rather than significant problems and opportunities.

Swent: That's very interesting because I think one of the things you are known for is your skillful presentations at board meetings.

Joklik: Well, that's kind of you to say.

Swent: No, it's not kind at all, it's just that that's what you seem to be known for.

Joklik: I think, perhaps, that's related to occasions when we had to persuade a reluctant board.

Swent: And perhaps because you did single out significant things to say instead of routine reports--I don't know.

Joklik: I've always believed that you owed it to an audience to make a subject interesting and not to have them fall asleep. I had given many presentations to the Kennecott board before I came to Salt Lake City. There were a couple of members who tended to fall asleep and I took it as a challenge to keep them awake.

Swent: Anyway, you were very good at it.

Joklik: Thank you.

Swent: But you didn't have a lot of routine meetings with your managers.

### Attitudes of Incumbent Managers

Joklik: At our first meeting I tried to bring home the urgency of our situation and the need to adopt measures that might be totally new to them, measures they either hadn't thought of, or thought would never become necessary.

Swent: Did they appear to welcome this or resist altogether?

Joklik: Well, some did and some didn't.

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Joklik: I had an opportunity to get the attention of senior managers in May, about three months after I took over. We had invited a consultant from Noranda, you know they're a competitor, to advise us on opportunities to reduce inventories in the precious metals recovery plant out at the Utah Copper refinery. This man was an expert in his field, and he graciously agreed to come and help us. He went to see the refinery superintendent, Bob Kirkham. From the record, consisting of several memoranda, I learned that once he got out there, Bob told him to "get lost." I didn't think well of that, so I asked Bob to come to my office and also Ken Matheson, the senior vice president of operations, and Wally Jensen, the general manager at Utah Copper. I told Bob carefully that his action was wrong and a recurrence would mean a parting of the ways for us. I had a hunch that this sort of reprimand hadn't been given at Kennecott for a long time. To Bob's credit, his attitude changed for the better. We promoted him to concentrator superintendent, where he performed well. He was a tough manager, but didn't take direction easily until he respected you.

### Ivor Pickering, Senior Vice President, Operations

Joklik: This incident, and others, began to alert my people that we were in for tough times, that we needed to have an open mind to change and innovation, and that we shouldn't disregard a suggestion just because it had never been tried at Kennecott. A major source of help was Ivor Pickering who was general manager at Ray Mines. He served a spell at headquarters, where his assignment was to begin formulating an environmental policy for Kennecott. I regarded "Pick" highly and appointed him senior vice president Operations.

Swent: Pick had also been at KRC, hadn't he?



Joklik: You're right. Good memory. He was there when KRC was built in the 1960s. He left his mark at Ray Mines as an excellent general manager. Pick was one man who could understand the breadth of the problems we were facing and had the strength to help me implement the changes that were necessary. He was already near retirement age, but was in excellent shape mentally and physically. He tended to demonstrate his physical well-being by trying to crush my bones when we shook hands. I caught on and reciprocated.

Pick was a clear thinker and had the ability to put down his thoughts on paper in a logical sequence. He was willing to take on any kind of assignment, even if it didn't measure up to his stature or capabilities. He wasn't afraid of the kind of cost cutting measures it looked like we'd have to undertake. As senior vice president of Operations, he was decisive, fair, popular and articulate. I persuaded him to stay on for almost two years after the normal retirement age of sixty-five. Pick was and is a good friend. He and Naomi live in St. George, Utah now. He's active in the LDS church down there.

We had several more general managers' meetings in 1980 to get the cost reduction process underway. At these meetings I said we had to address three areas: manpower, materials and methods.

#### Reductions of Manpower in Phases

Joklik: It didn't take a genius to figure out that Kennecott's operations and operating management were grossly overstaffed. Utah Copper had over 7,000 employees. The ratio of supervisory to salaried employees was out of line with our competitors'. One of the first things we did was to look at reducing the salaried ranks because, I said, there is no way all these hourly people will believe that reductions in manpower are necessary when managers are sitting around idle at headquarters. We picked out people with poor performance ratings who had, during the short period I'd been there, demonstrated lack of ability to cope with their job, or a lack of interest in doing their job properly. In addition, we had to eliminate some functions, which involved tough decisions. With the conditions in our industry, our exploration effort had to be reduced and our research activities had to be cut. There just wasn't justification for continuing to spend money at the rate we were, in light of poor results from exploration and research during the preceding years.

As copper prices began to slide, we instituted a 10 percent across-the-board salary cut for salaried employees at Kennecott.

We asked them to sacrifice a couple of weeks of annual vacation, and reduced some of their benefits.

Swent: Including yours?

Joklik: Yes. These measures originated right here in Salt Lake. I should remind you of the change in ownership of Kennecott, because it's going to affect events down the road.

In the aftermath of the battle with Curtiss Wright, Tom Barrow went to Al Whitehouse, the chairman of Standard Oil Company and discussed the possibility of Standard Oil taking an interest in Kennecott. I think by then, most oil companies had already acquired interests in mining, like ARCO taking over Anaconda and Shell acquiring Billiton. Al decided to bid for the whole of Kennecott lock, stock and barrel.

I believe this was in June of 1981. The price paid per share was \$60, when the market price was in the high \$20s. Tom Barrow became vice chairman of Standard Oil. I became a senior vice president of Standard Oil, while remaining president of Kennecott. In September we had a visit, here in Salt Lake, from the Standard Oil board. We gave them a review of our operations. I'm not sure what conclusions they drew from what we told them.

Swent: They didn't visit here before the acquisition?

Joklik: No. Due diligence was not thorough. Even though signs of a price down-turn were there, Kennecott was still making good money. It's just that the outlook for the future, if you thought about it carefully, wasn't good. A lot of people still had in mind the copper consumption growth rate of prior years, at 4 percent a year. And in the projections at Kennecott headquarters in Stanford, and later at Standard Oil, in Cleveland, using 2 to 3 percent real demand growth rates was acceptable.

Meanwhile, back at the ranch, our first request of the general managers was that they should analyze their operations and look at ways and means of reducing consumption of manpower and materials; and that they should bring to the fore any improvement in operating methods that might have a beneficial impact on costs. We got responses--

Swent: Did you have them set their own goals?

Joklik: Initially, yes. We got responses that were interesting, but quantitatively disappointing. To guide their thinking, we told them that under no circumstances should cost reductions be achieved through deferring necessary work. We also told them

that, whatever targets they set, they would not be held accountable. We wanted them to reach out and not worry that inability to attain targets would be a reflection on their performance. We went through a couple of iterations of that nature and, indeed, the response was such that at least the rapid cost inflation was being offset. But costs were still rising in real terms.

During the following year, 1981, it became clear that the rate of cost reduction would have to be accelerated. We began to set targets which we expected the general managers to meet. The targets were quantified in terms of cents per pound of copper. We did not, at that stage, say "You've got to let so many people go and see how it works" or "You've got to reduce your consumption of grinding balls and flotation reagents"--no, far from that. But, we told them that unless they reduced their costs substantially, they would begin losing money and eventually incur losses that would more than offset the costs of shutting down.

We got good cooperation. These were people who had been there for some time, and had experienced a mostly forgiving environment. This was now changing. I was gratified to see how they were handling change. They were self-disciplined and loyal people. Once they got the necessary direction, they came on board and tried hard to do what had to be done.

We implemented one phase of cost reduction after another. We paused between phases to gauge the impact. The last thing we wanted to do was shoot ourselves in the foot and be victims of a situation where costs would escalate out of control because we had cut back excessively on operating or maintenance people.

One obstacle in our way was the so-called Employment Security Plan which was part of our contract with the unions. Anyone laid off, due to technological improvements or redundancy, had to be placed in a pool where he would not have to work, but would continue to be paid. I'll talk more about that in connection with labor relations. But, we stepped around this obstacle and worked with the union leadership to give us the flexibility we desperately needed.

#### **Reduced Costs of Materials and Supplies**

Joklik: While manpower reductions were implemented in phases, we worked on costs of materials, both on quantities consumed and on unit prices paid. We brought in our major suppliers for meetings, not just

with the general managers, but with Ivor Pickering and me personally, so we could look them in the eye and say, "Friend, we have reason to believe you are gouging. Stop doing that, because if you don't, we'll drop you." More of our purchases of operating supplies and materials were put out for competitive bidding. Major changes were made to our traditional sources of supply.

Swent: Now, on some items such as power and transportation, you didn't really have an alternative source.

Joklik: Well, our power utility was UP&L.

Swent: You bargained with them--

Joklik: Yes. It wasn't entirely a one-way street. They were building new capacity based on the Central Utah Project. Also, this was a period when hydro-power was being wheeled in cheaply. These were good reasons for us to reduce our commitment to firm power and go to interruptible power, at a fraction of the cost.

Swent: So, you did have good leverage there.

Joklik: Yes. And, of course, we switched from oil to coal in our own power plant, at substantial cost savings.

#### Improvement of Operating Methods

Joklik: The third facet of our cost reduction efforts was improvement in operating methods. The first step was to train our front-line supervisors, to improve their technical and managerial skills. Here at Utah Copper, we put 1,500 of them through a series of courses that enhanced their effectiveness. We invited the union leaders to attend these courses, if they were interested. Many of them took advantage of our offer and sat in on them, which led to bonding between the hourly work force and the supervisors.

Swent: Who conducted the training?

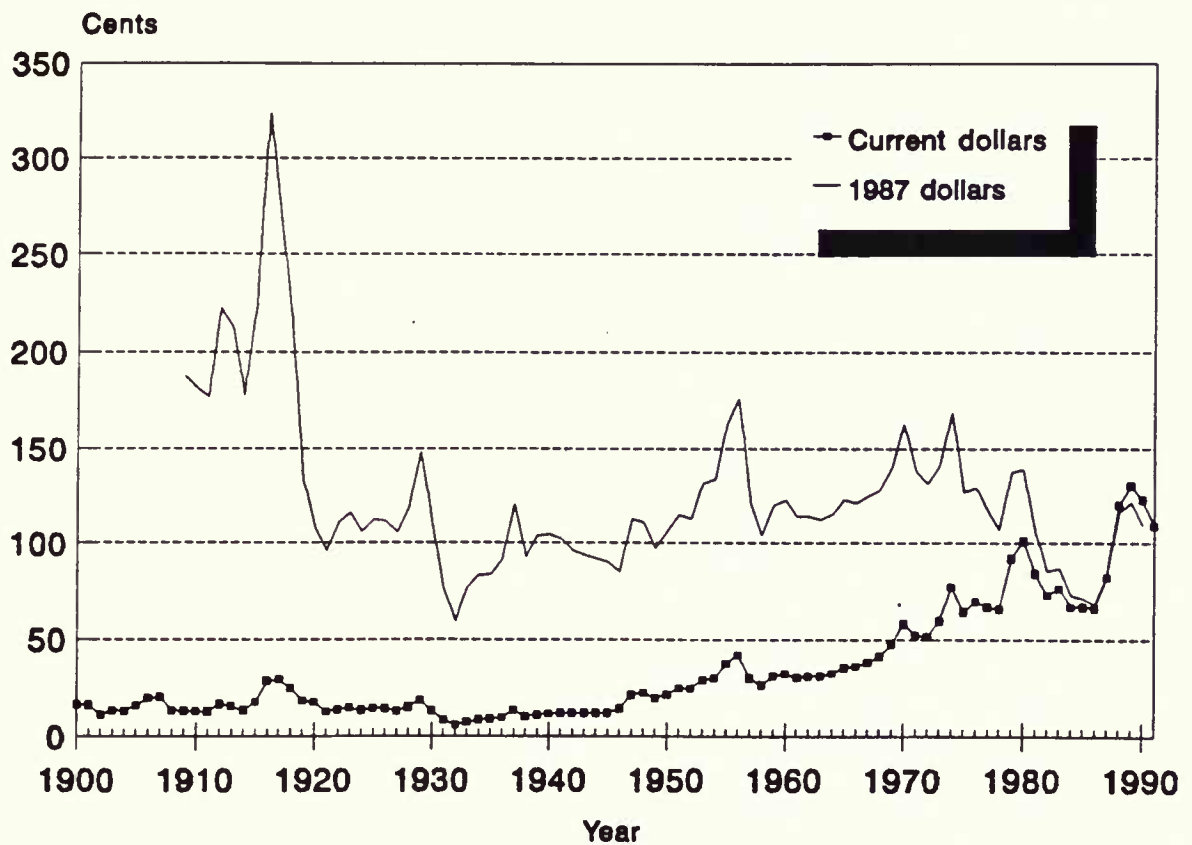
Joklik: We moved Hop Ensign from his position as general manager of the Baltimore refinery. Hop had the necessary background and organized the program. The training was done by in-house personnel.

Coming into 1982, the prices of copper, gold and silver were still falling from the market highs of 1980. The copper price declined from over a dollar to less than 70 cents. Gold and



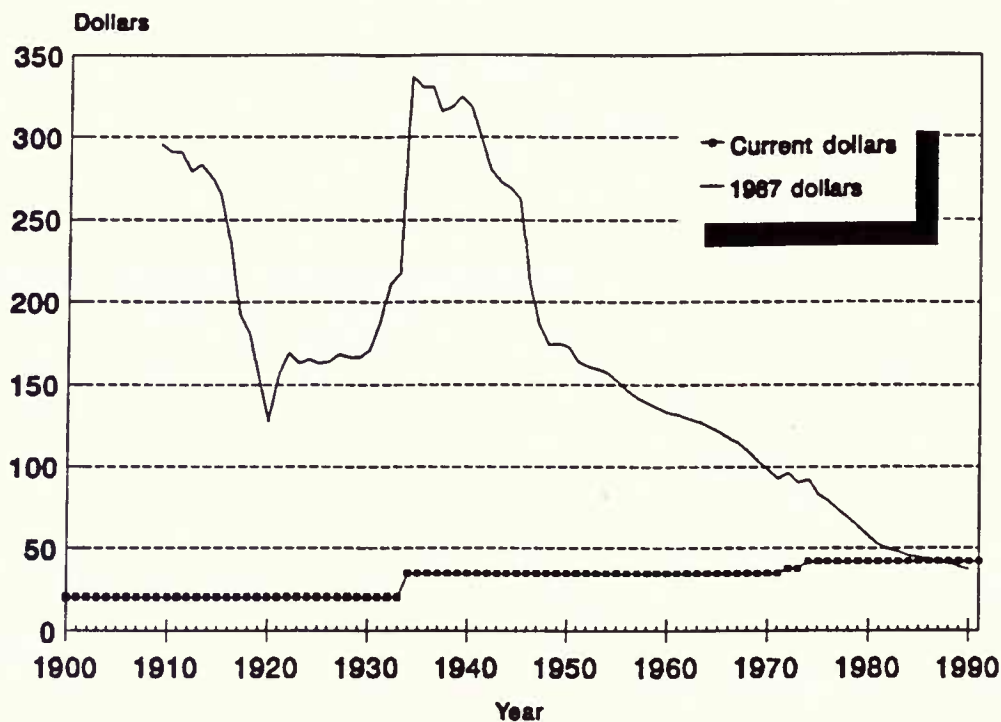


## Average annual copper prices (Cents per pound)

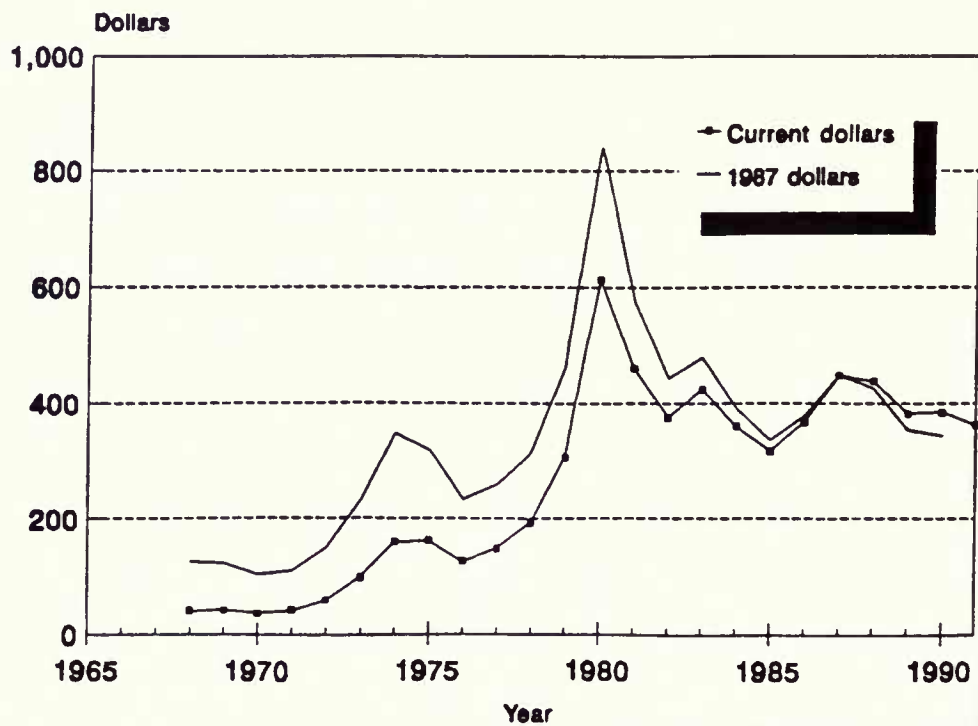


Source: U.S. Bureau of Mines

# Official annual gold prices (Dollars per troy ounce)



## Average annual gold market prices (Dollars per troy ounce)



Source: U.S. Bureau of Mines

silver accounted for almost one third of the revenues at Utah Copper.

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Joklik: When the price of silver dropped from \$40 in 1980 to below \$10, and then the gold price declined from a peak of \$800 down to \$400, it became hard to keep pace with the drop in revenues through cost reductions, especially since the inflation rate was still in double digits.

By the end of 1981, Ray and Chino were losing money. We made the tough decision, late in the year, to shut down both operations, for different reasons. At Ray we had, in any case, scheduled a two-month maintenance shut-down. At Chino, and I'll come back to that later, we had under construction a new concentrator and corresponding expansion of the mine; the shutdown fitted in well with the transition from the old plants to the new. During the shutdowns we were able to think about potential improvements in operating practices throughout the operations, and look at all jobs to determine what might or might not be achieved by eliminating redundancies.

The cost reduction program continued in 1982. I used to go out to Utah Copper frequently to review operations. Wally Jensen generally came with me. One day, we were standing out there in the warm spring sunshine, after a cold winter, and were talking about what else could be done. When I first knew Wally, it must have been before I left Kennecott to join Amax. He was then smelter superintendent out at Garfield. When I came back to Kennecott, he was general manager at Utah Copper. Wally wasn't the most articulate person in the world. Of all the general managers, I thought I'd have problems with him in effecting changes. In the first months of my stewardship, I got signals, through what he said and his body language, that some of what I was proposing didn't suit him. But, as we got to know each other, I got the feeling that he was coming around. He surprised me that particular morning when he said, quite detachedly looking into the distance, "You know, Frank," he said, "I think we can cut another nine hundred." Well, the magnitude of it shocked me. I asked, "Where the heck are you, at this stage of the game, with the reductions we've had, where are you going to get that many from?" And then during the next half hour, he outlined his thoughts on how to reach his target. You know, it's not a question of 'why hadn't he said that before.' He now was clearly prepared to take major risks, because he'd finally come to accept that the future of his operation was in jeopardy.



We developed a detailed plan, in collaboration with Ivor Pickering. I then went to Governor Bangerter and told him we were about to carry out another major layoff. This again required not only Wally's full collaboration, but that of his plant managers in the mine, the concentrator, smelter and refinery. And I almost got the feeling that some of these guys had gotten a little trigger happy, and were prepared to take excessive risks. I was worried more about maintenance than operations. You soon find out in operations if you've got enough people to turn valves, prime pumps or whatever. But, when it came to maintenance, we were dealing with concentrators which had been installed in 1907 and 1908, including 40-cubic-foot flotation cells and tiny rollcrushers, ball mills and rod mills. A lot of this equipment was of a vintage for which we had to make our own replacement parts. We had a workshop to manufacture the weirdest looking objects which didn't have a place in modern machinery anymore, but were needed for these Rube Goldberg contraptions.

Swent: Something like jaw crushers?

Joklik: Yes. Our primary crushers at Ray and Chino were jaw crushers that were originally manufactured for use in the construction of the Panama Canal! They were still operating when we shut down Ray and Chino. But at Utah Copper, we already had gyratory crushers. What gave us fits were the thousands of transfer points, hoists, and drop boxes, half of them made from wood that was splintering. So, when you reduce maintenance of such facilities below a certain minimum, you're asking for real trouble. Early in 1983, we actually had to institute a catch-up maintenance program at Magna and Arthur in the old mills. It wasn't a huge amount of money, about \$12 million, and could hardly be classified as major capital investment. We just hadn't had enough people there to do routine maintenance and needed to catch up.

Swent: Just a couple of quick questions. Ultimately I think your reduction was almost 4,000, wasn't it?

#### **Personnel Reduction 31 Percent, Kennecott-Wide**

Joklik: By the end of 1982, we had reduced the work force at Utah Copper from 7,000 down to 4,700. The reduction was 33 percent. At Ray, we'd gone from 2,060 in 1980 to 1,400, a reduction of 32 percent. And at Chino we'd dropped from 1,590 to 1,300, down 18 percent, but we had increased production at Chino by almost 50 percent, with the new concentrator. The total reduction, then, was from

12,700 down to 8,800, or 31 percent Kennecott-wide, without sacrificing production.

Swent: The other question I had, you mentioned going to the governor of Utah. Obviously this had a major impact on the local economy. Were you in touch with the governors of the other states where this had an impact?

Joklik: Yes, we were.

Swent: And were you seeing the governor officially or just because you just happened to be friends?

Joklik: Both. Norman Bangerter succeeded Ken Matheson as governor in 1984. He had been speaker of the House and then served two terms as governor. He did an outstanding job. Norm was a businessman who came from the construction industry. You didn't have to tell him that Kennecott was important to the state's economy. He was effective in politics because he didn't come across as a politician. Since his integrity was beyond question, he was widely respected and liked.

Swent: Well, of course.

Joklik: Kennecott's importance to the economy of Utah has been quantified by the head of the economics department of the University of Utah, Thayne Robeson, a nationally and internationally recognized economist. He has a constant finger on the pulse of the state's economy. Thayne has periodically measured the multiplier effect of Kennecott's operations and has written papers on the subject. It's about three to one.

#### Support of State Government, Utah Congressional Delegation and News Media

Joklik: We also had valuable support during those difficult times from Jake Garn, and Orrin Hatch, the senators from Utah. Garn is a former mayor of Salt Lake City. He became chairman of the Senate Banking Committee. Jake's occasional outbursts of righteous indignation were respected in Washington circles and enhanced his effectiveness. The other senator from Utah, now the senior senator since Jake's retirement, is Orrin Hatch. In my opinion, he is one of the brightest members of the Senate, a highly articulate and energetic man who was always supportive in our time of need. He is a close personal friend.

Congressmen Howard Nielsen, Jim Hansen and Bill Orton were always accessible and would go to bat for us in the House when it counted.

Swent: May I just ask about your local public relations? Did the press, for instance, come down on you? Or the media, the television--

Joklik: We spent a lot of time explaining our position. We tried not to surprise them. The morning paper is *The Salt Lake Tribune*. The publisher was Jack Gallivan, one of our leading citizens. They had a business editor, Bob Woody, who was known throughout the country as a keen analyst of business. He was well acquainted with Kennecott's operations. We invited him to meetings with our union leaders when they weren't of a confidential nature. He wasn't a guy you could lead. He had his own point of view, but recognized that we were trying to keep him informed and generally treated us sympathetically.

One such occasion was the "Millwright" agreement we negotiated with the union locals at the Utah Copper concentrators. This was our first step in eliminating job demarcation lines, so that an employee who was adept at welding and pipe fitting could do both jobs. It gave us the opportunity to reduce the work force by another 100 people.

Swent: Millwright was a new job classification?

Joklik: Yes. It resulted from a meeting with Bob Petris, who was the Steelworkers' western region president, and local union leaders in Los Angeles early in 1983. Whenever I met with the unions, I informed them about the economics of our operations and about metal markets. I wanted them to understand how the future appeared to me. I never talked down to these people because I respected their intelligence.

In 1983 we initiated a major change in the operations of the Bingham Canyon pit by starting to switch from rail haul to trucks.

Swent: Major.

Joklik: This change produced important benefits, in terms of cost reduction. We were able to reduce the stripping ratio by steepening the pit slopes. By eliminating the rail switchbacks, we gained access to a large tonnage of good grade ore in the northwestern sector of the pit. We knocked a few cents off our production cost. But Mother Nature evidently didn't like what we were doing because--

Swent: It was a bad year.

### Record Winters Hamper Production

Joklik: --those winters of 1983-1984 and 1984-1985 were the wettest and coldest on record in Utah. Skiers were delighted, but the weather played hell with our operations. Not so much in the pit. It never took more than a few hours to shift three or four feet of snow off the tracks or haulage roads. The problem was getting the frozen ore out of railroad cars and drawing ore from stockpiles. The cold gummed up ore chutes at transfer points, froze ore onto conveyors, choked up secondary and tertiary crushers and reduced ore through-put drastically. We realized that we should have planned to mine only blocky ore in the wintertime. Such ore contained less clay and, therefore, didn't congeal as badly when it froze. But, this was hindsight. We just didn't have enough production faces available to supply only blocky ore. Rod Davey, who was managing the pit, worked miracles in juggling the sources of ore production.

Throughput dropped, and unit costs rose sharply. At monthly review meetings in Cleveland, where Kennecott's new owner, the Standard Oil Company, was headquartered, I reported losses on the order of \$20 million a month by the time we got into late 1983. You can imagine, after I'd been to these meetings three or four times and said, "It's still snowing and it's still unseasonably cold," how the board members yawned. The mounting losses eventually necessitated the shutdown of Utah Copper. In June, 1984 we shut down two-thirds of the operation. In March, 1985 we had to shut down the remainder.

Swent: Were Ray and Chino back in operation then?

Joklik: They were.

Swent: So, they were up for--

Joklik: Operations at Ray had resumed after a shutdown of eight months. We did not start up the smelter again. We tolled concentrates through Asarco's neighboring Hayden smelter. We did not initially start up the leaching operations at Ray. You see, at both Ray and Chino, leaching of waste rock was an appreciable element of production. This was not the case at Utah Copper, where we were mining primary sulfide ore. The precipitation plant at Utah Copper, even back in 1980 produced only 7,000-10,000 tons of copper a year, of a total production of well over 200,000 tons.

But at Ray, where there were large reserves of silicate ore, we developed a method of leaching with sulfuric acid and



recovering copper in the existing solvent extraction, electro-winning plant [SX-EW].<sup>1</sup>

Chino was back in operation, after construction of the new concentrator and the new smelter. We had planned to construct an SX-EW plant before Chino was eventually bought by Phelps Dodge,<sup>2</sup> but that's jumping ahead.

Swent: That's later.

Joklik: So far I've discussed, in some detail, our program of cost reduction without substantial capital investment.

Swent: This was phase one--step one--

#### Copper Price Decline Outpaces Cost Reduction

Joklik: Yes. It was the first of our principal objectives. Copper prices, meanwhile had plummeted from a dollar a pound back in 1980 to the \$.50 to \$.60 cent range and had remained there. Prices were bouncing along the bottom line of the price graph. There was no way cost reductions could fully off-set the decline of real copper prices to all-time lows.

#### Acquisition of Anaconda's Carr Fork Property ##

Joklik: Before I leave the subject of cost reduction without capital investment, I should mention Carr Fork. On the west side of the Utah Copper ore body is high grade copper mineralization in limestone formations. These rocks are intersected by the monzonite stock which contains much of the Utah Copper mineralization and are 3,000 feet below the Bingham Canyon drainage. They continue up-dip toward the west into what is known as the Carr Fork area.

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<sup>1</sup>Wayne Hazen, Plutonium Technology Applied to Mineral Processing; Solvent Extraction; Building Hazen Research; 1940-1993, Regional Oral History Office, University of California, Berkeley, 1995.

<sup>2</sup>Warren Fenzi, Junior Engineer to President, Director of Phelps Dodge, 1937 to 1984, Regional Oral History Office, University of California, Berkeley, 1996.

Now, the boundary between Kennecott's property and Anaconda's adjoining property ran along the western margin of the pit and inhibited stripping to expose ore that was accessible by open pit mining. For many years, therefore, negotiations had been going on between Kennecott and Anaconda, to give Kennecott stripping rights to Anaconda's ground in the Carr Fork area.

Swent: Was Anaconda actually mining there or just holding?

Joklik: No, they weren't mining.

Swent: But they held the property.

Joklik: Yes. As negotiations wore on, Kennecott couldn't agree to the price asked by Anaconda. The asking price was in the range of \$30 to \$50 million. Then, Anaconda developed the Carr Fork mine, to access the copper-bearing limestone formations from the Tooele Valley side, on the west side of the Oquirrh Range. But, the grade turned out to be much lower than it was in the Bingham Canyon area--only about 1-1/2 percent copper versus 3 to 4 percent.

Anaconda put down twenty drill holes from the surface, defined an "ore reserve," began shaft sinking and built a concentrator in Carr Fork Canyon. This mine came on stream in the late 1970s and operated for only about eight months. They experienced uncontrollable dilution from the adjoining formations. The concentrator operated at only a fraction of design capacity, which was about 10,000 tons a day. They had to shut the mine down and take a write-off of about \$200 million.

The concentrator was subsequently dismantled. The next time I saw part of it was at Ok Tedi, in Papua New Guinea. The other part went to the Quintana project in Arizona, I think. Anyway, after that misadventure, and their general withdrawal from the mining industry after ARCO took them over, the Anaconda people were much more disposed to make a reasonable deal with Kennecott for this ground on the west side of Bingham Canyon. In 1983, I negotiated an agreement with their president, Ralph Cox, whereby we bought their land holdings, with some exceptions, for only \$5 million. This deal gave us access to another 200 to 300 million tons of good grade ore in the western part of the Bingham Canyon ore body. When I say "with some exceptions," there were some slag, tailings and waste rock deposits resulting from Anaconda's historic lead mining operations, that we clearly did not want to acquire title to. These deposits were in the Tooele valley and along the eastern front of the Oquirrh Range.

## Fear of Permanent Shut-Down of Utah Copper

Joklik: Let me make a few comments about the atmosphere in which our very substantial manpower reductions took place between 1980 and 1984. I learned that to agree to a reduction of people whom you didn't know personally certainly caused concern about their future employment prospects. But if you knew them personally, you went from considering groups of people to caring for individuals. That was much more traumatic. The attitude of almost all employees we had to let go was surprisingly understanding. I'm not saying they weren't full of anger, disappointment and resentment--they were--but I was surprised, especially during the town meetings we later held at our operations, how well they understood our business and accepted our conclusions.

Here in Salt Lake, the relatively supportive attitude of the media and politicians was influenced by everybody's fear, including mine, that we were going to lose the operation entirely. By the time we closed down Bingham Canyon, the copper industry in the United States had been downsized from an annual production rate of 1.7 million tons of newly mined copper ore to less than one million tons.

The new ownership of Kennecott by Standard Oil didn't augur well for us. We were getting signals that mining would never fit with their core businesses. The gulf between their philosophy and ours gave reason to fear that Bingham Canyon would remain shut down for a long time, and that capital to refurbish the operations and bring them back into production just wouldn't be made available. The demise of the mining industry, as highlighted on the cover of *Business Week*,<sup>1</sup> was something the public had bought into.

## Fate of Terminated Employees

Joklik: It wasn't easy to terminate people we knew well in headquarters, especially since many of them were well qualified. You see, these reductions of force were on a scale where you weren't just letting poor performers go. Whole functions staffed by good performers were eliminated. They were good people forced to go out and look for employment in a lousy job market.

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<sup>1</sup>"The Death of Mining," P. Houston and others, Business Week, 17 December 1984.

Where did the majority of them find employment? Well, amongst the salaried people, many left mining and were permanently lost to the industry. They were engineering, financial and human resource professionals. At least, they had the qualifications and, many of them, the means to seek employment elsewhere and move, as needed.

This was generally not the case with the hourly people. They had, at least, been well paid by Kennecott. Some had savings. Many went to our suppliers. You'll recall the multiplier effect that Thayne Robeson calculated at three to one. Others went to the service industries and took jobs which paid less.

I always kept the door at my office open. Anyone could come in to talk. I never refused a phone call. I also made a point of being visible out at the operations. Our human resource people had concerns about my safety. Although my family and I did not take any precautions, we were neither threatened nor harmed during the years when Kennecott's work force was being reduced by more than one third.

Swent: Was there any problem out at the plants? Did they--

Joklik: Sabotage? No. There were slowdowns before and during labor negotiations. There were a few unexplained breakdowns in the plants, but nothing we could attribute to anyone. Frankly, the equipment was so worn out anyway, it was--

Swent: Hard to tell.

Joklik: Yes. As I'll probably discuss more in connection with labor relations, I think our hourly people sensed I sympathized with them. I regarded my role as that of an employee exercising a period of stewardship of the operations.

Swent: That's the other thing that doesn't show; that people were lost to mining just because there was no incentive to go into mining during those years; that's beginning to become even more apparent now, I think.

Joklik: Well, how many students graduate in mining engineering each year?

Swent: Very few. And mining schools--

Joklik: Only one hundred mining engineers graduate a year in the United States.



Swent: And then not only the engineers, just think of the high school students who don't even think of this as something to go into.

Joklik: Absolutely.

Swent: Whereas in previous generations, of course, that would have been the logical thing to do here, wouldn't it?

Joklik: Yes.

Swent: Go to work for Kennecott.

Joklik: Yes. The bright side of the reductions of the work force was that, at least in the salaried ranks, we sometimes succeeded in retaining the best people. Because of seniority provisions, this wasn't always possible with the hourly employees.

Swent: Well, the work force reduction wasn't just an empty exercise, obviously.

Joklik: No. At Utah Copper, the result was a reduction of costs, in real terms, of 25 percent from 1980 to 1984.

At Ray and Chino, costs were reduced by 50 percent in real terms. At Chino, of course, much of this result was attributable to the expansion of the mine and the construction of a new concentrator and smelter.

Swent: Were these in line with your expectations? Apart from the weather, let's say.

Joklik: We would, of course, have preferred to have even more spectacular results. At Utah Copper, the cost reduction program saved that operation from long-term shutdown, if not abandonment. The same could be said for Ray and Chino. The next element of cost reduction were the labor negotiations of 1986, but I'll come to that later.

Swent: What about Kennecott Refining Corporation?

Joklik: The Baltimore Refinery was built at the East Coast, with the idea of refining copper from El Teniente in Chile. Once El Teniente was nationalized, KRC became redundant. It was out of the way geographically. There was little point in shipping anodes all the way to the southeast and bringing cathodes back to the midwest for marketing. Despite manpower reductions, the plant was not as efficient as it was when its capacity was fully utilized by production from the operations in South America.

Lobbying in Washington on Behalf of the Domestic Copper Industry##

Joklik: Perhaps I could digress now and give a brief account of our attempts to obtain help in Washington for the hard-pressed domestic copper industry.

Swent: Yes, please do.

Our Argument

Joklik: We sought out key people in the executive and legislative branches of government, explained to them our plight, and suggested means by which we might gain relief. The first question was how to stem the tide of excessive copper production from Third World countries. The operations in those countries were now mostly government owned. Financing of expansions and new projects was being facilitated by international lending agencies such as the IMF, the World Bank, the Interamerican Development Bank and other regional equivalents. Commercial banks were being persuaded to lend to these government-owned operations at less than commercial interest rates. The loans were guaranteed by the governments concerned.

We realized that we might not gain much relief from the international governmental lending agencies. Even though the United States is a principal contributor to these agencies, when it came to voting, the U.S. generally was outnumbered by blocs of nations that didn't have much sympathy for U.S. policies. This subject had already been addressed by Congress, to no avail, in the course of endless debates over funding for the agencies.

We thought we might be able to achieve more by attempting to restrain U.S. commercial banks from making cheap loans to Third World governments, ostensibly for the purpose of alleviating their straitened circumstances. In fact, such funds tended to be diverted to natural resource development projects, including copper projects which were made to appear to be economically sound only by virtue of such liberal lending. We felt that this practice was not in the interests either of the banks or the host countries. Natural resources were being developed to levels of over-production that caused declines in commodity prices and losses of revenues. Overproduction by Third World producers inevitably spelt continuing losses for U.S. companies, like overselves.

We believed we had a good case and debated how we should go about presenting it. With all our staff reductions, we didn't have people readily available. I was going to be doing most of the lobbying, assisted by our general counsel, Don de Brier. Don had a keen mind and tenacity, qualities that were needed for a successful campaign in Washington.

The third member of our little team was our Washington representative, David Litvin, a bright young man who had degrees in metallurgical engineering and law, knew his way around and was well known and respected in Washington.

Early in 1983, we put together a brief, stating our views that commercial banks should be restrained from lending as I described. We decided to begin with the legislature, rather than the executive branch. That turned out to be a wise decision. In the Senate, we had two strong supporters from our state of Utah Senators Jake Garn and Orrin Hatch. We suggested that our concern be put in the form of an amendment to an IMF funding bill. To introduce that amendment required sponsors. If the amendment came through the appropriate committee to the floor of the Senate, we would need a majority of senators to be sympathetic. The mining industry is concentrated in western states, where the population and the politicians are familiar with the industry and its importance to the national economy. Outside of those few states, familiarity with the mining industry is lacking. I'm not saying anything new. In the 16th century, a scholar named Georg Bauer, also known as Agricola, wrote a treatise entitled "De Re Metallica." It was translated into English by a mining engineer, the former president of the United States, Herbert Hoover and his wife. The book contains whole chapters that could be lifted out and applied today. Herr Bauer lamented the poor popular image of the mining industry, which doesn't appear to have changed in four centuries.

### Venturing East of the Mississippi

Joklik: It wasn't just a matter of convincing our already sympathetic senators from the West. We had to go to and beyond the Mississippi. It was amazing how receptive these men and women who'd never dealt with a mining issue turned out to be. They seemed to appreciate our coming to see them and explaining our point of view. That's a criticism I have of our mining industry--the reluctance of senior executives to go to Washington and lobby. Few of their Washington representatives were as competent and experienced as our David Litvin was. But, Washington

representatives, by and large, reach only staffers of members of Congress. Staffers have their own slants and tend to modify issues accordingly.

We used to make twelve appointments a day, allowing a half hour for each. Don was quick on the tennis court, but he didn't like to walk fast. David and I would arrive punctually, out of breath, and Don would saunter in maybe five minutes later. That wasn't all bad, because he'd reinforce what we'd been saying. Sometimes, towards the end of the day, I would get sympathy from a member of Congress about having had a long day. My usual response was, "Well, it beats working," because I honestly did not find lobbying a difficult chore. I enjoyed meeting the people. I was pleasantly surprised by the level of, well, I don't want to sound patronizing, but these were bright people. To get elected to Congress, you evidently need to have some intelligence. We found few people, either in the House or the Senate, of whom we thought, "We spent time, but they didn't understand what we were saying."

Swent: Well, that's good.

Joklik: I don't have a record of how many trips we made. We used to go every couple of weeks. In the course of our campaign, we covered about two-thirds of the Senate and one-third of the House. Among the senators from east of the Mississippi, one of the most important meetings was with Senator John Heinz; as you know, he died in a plane crash. He became a co-sponsor of our amendment.

In the House, we didn't know where to begin, because the representatives from Utah, Jim Hansen and Howard Nielsen, weren't--

Swent: They weren't senior enough--

Joklik: Well, they were, but they just weren't on the relevant committees. They supported our campaign, but we needed an influential standard bearer from among the Democrats who dominated the House. The person we singled out was Mary Rose Oakar from Ohio. She was a feisty lady. Rather than viewing our plight in the context of damage to the U.S. copper industry, she took it up as an employment issue. She zeroed in on the loss of jobs, due to mines shutting down. She was invaluable in gathering support amongst her colleagues in the East and introduced our amendment in the House committee.

Swent: And you got the IMF funding bill amended?

Joklik: Let me tell what the amendment was. It required evaluation of loans by commercial banks to governments and government-owned



enterprises in foreign countries. U.S. commercial banks would have to screen foreign mining, processing or fabricating projects, larger than \$20 million, on the basis of economic viability, without regard to direct or indirect government subsidies. The amendment required U.S. banks to conduct a written economic feasibility evaluation of a pending project proposal, for such evaluation to be approved by a senior bank official and to be retained on file for review by federal bank regulatory officials. The written evaluation was to include the profit potential of the project, the impact of the project on world markets, inherent competitive advantages and disadvantages over the project's life and the effect of the project on the long-term economic development of the host country. The evaluation was also to address whether the loan could reasonably be expected to be repaid from project revenues, without regard to any government subsidy.

Swent: In other words, you were imposing some capitalistic analyses on countries where they wouldn't have done it that way.

Joklik: The purpose of the legislation was to help dry up the burgeoning flood of artificially stimulated copper producing projects in the Third World countries.

Swent: Did you work at all with the Mining Congress?

Joklik: No. They didn't understand the issue, and weren't interested. Allen Overton, the president of the Congress, was a good friend of mine; but this was a bit beyond his field of vision.

Swent: You were on your own.

#### Executive Branch not Supportive

Joklik: We tried to get the executive branch on side. With a couple of notable exceptions, we got virtually no support. Bill Clark, or Judge Clark as he was called, was secretary of the Interior. I had come to know him because I was asked to be a member of a committee which advised the secretary of the Interior on critical and strategic materials. The committee was chaired by a former Intelligence Service officer, Admiral Bill Mott.

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Joklik: It was drawn from representatives of industry, academia and state government agencies, and met periodically in Washington. Our

resolutions were forwarded to Secretary Clark. He was genuinely interested and attended several meetings. So, when I went to him with our concerns about the copper industry, we had a willing listener. The other cabinet member who supported us was Malcolm Baldrige, the secretary of Commerce. But in other agencies, such as Defense and State, we made no headway.

The secretary of the Treasury, Donald Regan was adamantly opposed. His assistant secretary, named Tim McNamara, behaved in the most irrational, offensive manner. Regan put it around--we heard this from several sources--that we had two floors of attorneys working on our campaign. He reportedly ordered the "Kennecott Bill" to be killed.

#### Congress Passes the "Kennecott Bill"

Joklik: The IMF bill, with our amendment attached, was approved by voice vote in the Senate 55-34 on June 7, 1983. Senators Jake Garn, Pete Domenici and John Heinz were sponsors. It took a little longer in the House. House approval came on August 3, 1983, with a vote of 217-211.

We realized we'd raised hackles in the banking community. I happened to know Tom Theobald, a former neighbor of ours from Connecticut, who was then vice chairman of Citibank. Tom understood our position. He helped assuage the concerns of the banking community regarding potential fallout from our amendment.

Swent: Bankers might look on this as--or might welcome it as a protection of their own interests.

Joklik: You might have thought so. Because, in the aftermath of profligate lending and spending on projects--

Swent: Brazil and Argentina--

Joklik: --dams that weren't needed, highways in the middle of nowhere, crops in climates they weren't suited to. A lot of these projects went "belly up."

Swent: Yes, many of them.

Joklik: There shouldn't have been much opposition. Anyway, the amendment did pass and we felt vindicated.

Swent: Is this in effect still? Has it continued?

Joklik: To the best of my knowledge, yes. But, this is not the end of the story. In lobbying for the IMF bill amendment, we stressed that we were for free trade, but wanted a level playing field. The White House was paranoid about free trade. This was early in the Reagan administration, and free trade was almost a religion.

#### A Misdirected Initiative--Section 201 Trade Case

Joklik: Now, one of our competitors, Asarco, persuaded some of the other major copper producers to join in a major trade case, under Section 201 of the Trade Act of 1974. This section was designed to provide relief to elements of U.S. industry if it could be shown that the problems being experienced were caused by unfair foreign competition. There was a two-stage procedure. First, an analysis of the problem and its cause and second, a decision by the president whether relief should be granted in the national interest.

We worried that if the president went ahead and imposed tariffs or quotas on copper, the people who were going to be hurt would be our customers. The last thing we wanted was a two-tier price structure whereby they, by virtue of tariffs, paid more for copper than their competitors overseas. We got a message from our customers that they would fight this initiative to the bitter end. When we saw the initiative gathering steam, we insisted that the industry would oppose the imposition of quotas or tariffs; and that instead, the President would cause the U.S. Trade Representative to enter into a dialogue with Third World government copper producers, such as Chile, and convince them that the copper industry in their country would be hurt by overproduction.

Swent: Is there a copper industry council or anything like that?

Joklik: The Copper Development Association consists of U.S. fabricators and producers. I was president from 1984 through 1986. Then there's the International Copper Association. Neither of those are lobbying organizations. They deal with research and marketing.

Swent: So they don't speak out on this kind of thing at all?

Joklik: No. When we were lobbying for the IMF amendment, the U.S. Trade Representative was Ambassador Bill Brock; he tried to be helpful. He again supported our position in the current debate, as did Secretaries Clark and Baldrige.

## President Reagan's Courtesy

Joklik: I had a conversation with President Reagan here in Salt Lake City. From his reaction, I don't think he'd heard about our trade case. Although he was courteous, I could see he was not going to be supportive.

Swent: What was the occasion of his being here?

Joklik: A campaign stop. The government's analysis of the issue concluded that injury to the domestic copper industry was indeed being caused by foreign imports and that remedies were, therefore, in order. But the president decided that no action should be taken.

Swent: Hm. So, there were no quotas imposed?

Joklik: We weren't asking for quotas.

Swent: No, no.

Joklik: We wanted negotiations with the foreign producers to be conducted through the office of the trade representative, and this is what the president denied. I believe that was in September of 1984.

Swent: Just before election.

Joklik: Exactly. His denial was intended to be viewed as a blow for free trade, just before the election. The irony was that a few days later, the president directed the U.S. Trade Representative to negotiate Voluntary Restraint Agreements (VRAs) to protect the U.S. steel industry for the period October 1, 1984, through September 30, 1989. If our initiative could be viewed as being anti-free trade, these VRAs were so in spades.

Swent: Yes, indeed.

Joklik: We didn't lose totally. With continuing support from our friends in the Senate, a trade bill was passed on September 20, 1984, with our resolution for negotiations with Chile as an amendment. This was not binding on the president, but it went on record as the sense of the U.S. Senate.

Swent: Was it effected?

Joklik: On October 10th, both the House and the Senate passed a trade bill that came out of conference, with the same amendment included. To the best of my knowledge, the trade representative never did enter into negotiations with Chile. By then, Ambassador Brock had been



succeeded by a person who pretended to be sympathetic to our case, but wasn't.

### Seeking Amendment of Mining Law

Joklik: More recently, I lobbied for rational amendment of mining legislation. We believed that dogmatic adherence to the Mining Law of 1872 was counter to the interests of the mining industry.

Swent: In all fairness, the law has been changed since 1872. It isn't--

Joklik: Yes, but nothing significant to bring it into line with today's environment. The patent system has been abused.

Swent: Developing golf courses and so on.

Joklik: Yes, and real estate development projects.

As you know, most states have enacted environmental legislation and regulations. In fact, they're required to by the EPA. For this not to be acknowledged in the mining law, and pretend that the mining industry is unregulated, is nonsense.

In 1992, I lobbied for amendments to the mining law proposed by industry, and against the proposed Bumpers-Rayhall legislation. The story I got from Senator Bumpers was that he only wanted "reasonable amendments." I don't think anyone from the mining industry had been to see him. As for Congressman Nick Rayhall, he's from West Virginia, from coal mining country. When I first knew him, years ago, he was a pro-mining advocate. When coal got hit with royalties, he thought the rest of the mining industry should, too. By the time we got to see him, he was saying, "This is out of my hands. There are a lot of people who want to do worse things to you guys than what I'm proposing. I'm just following the leaders."

The industry's bill wasn't adopted. We at Kennecott set about drafting a new version which was endorsed by the American Mining Congress and sponsored by Senator Larry Craig of Idaho. We were hoping to have a coalition of Republican and Democratic western senators support it. I lobbied them individually and collectively. The Clinton administration found a way to pull the Democrats off our bandwagon, on the promise that the issue would be taken up in connection with other legislation. This didn't happen. The Senate eventually passed the Craig bill. The

Bumpers-Rayhall bill was adopted by the House. A "compromise" was to be hammered out in Conference. We're still waiting.

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Joklik: You know, people tend to be derogatory about political processes. Sometimes I think: "You're so bright, so full of good thoughts and intentions, why don't you get involved?" It's easy to be critical, especially when you don't participate.

### Labor Relations and Contract Negotiations

Joklik: Well, so much for our experiences in Washington. What I'd like to talk about now are Kennecott's labor relations, beginning with 1980, the year I was appointed President. It happened to be a year in which our three-year labor contracts expired. As I said previously, labor relations were pretty rocky prior to 1980. There hadn't been a strike-free settlement in twenty-five years and 1980 didn't turn out to be any different.

Swent: Let me just ask a general question. Were these particularly rancorous strikes?

Joklik: I suppose so. In the 1980 negotiations, I was pretty much a bystander because preparations had begun prior to my becoming President. Glenn Bakken decided he wanted to complete what he had started.

Swent: This is Steelworkers.

### Union Organization and Leadership

Joklik: Yes. They accounted for 70 percent of the represented personnel. The other 25 percent were represented by craft unions. We had thirteen international unions and fifty-five locals, covered by forty-five individual contracts representing 9,500 workers at five Kennecott locations. As contracts neared expiration, copper producers took note of the results of steel and aluminum negotiations which generally preceded copper. The unions expected copper companies to aim at similar patterns of settlement. The unions would single out one lead company, try and reach an accord

with that company, and then impose that settlement on the other companies.

The unions--that is, the Steelworkers and the craft unions--constituted the Non-ferrous Industry Conference. The Steelworkers were the majority, but the crafts were used to also having their day in the sun. On this particular occasion, in 1980, the contract expired. A settlement had not been reached because of disagreement over a COLA (cost of living) payment. The workers walked out, didn't show up for work after June 30th, and stayed out on strike for seventy-one days. The losses to the company and to the work force were enormous. In the subsequent settlement, the company gave the unions pretty much what they asked for.

We then hired Judd Cool as vice president of Human Resources. Judd was a competent labor relations professional from way back. He and I agreed that we would never let things drift, the way they had in the 1980 negotiations. We decided to not just forget about labor relations for three years until the next contract expiration, but to work on problems and opportunities right through that period, both at the local level and with the international unions.

We organized a conference of the union leadership with management for the following autumn--the autumn of 1981. We invited to this meeting not only the union leaders from our operations, but also the international presidents, foremost amongst them Frank McKee, president of the United Steelworkers of America, and members of his staff. Bob Petris was there as regional president of the Steelworkers. The venue was in Phoenix. There were about 120 union representatives. I was there with Judd Cool and members of the Human Resources department.

Swent: You were outnumbered.

Joklik: Just slightly, yes.

#### At End of a Pick or Shovel

Joklik: Frank McKee was one of the old breed of union leaders. A strong man, Irish, outspoken with a good sense of humor. I liked him and believe the feeling was mutual. The same went for Petris. Although I never condoned abuses in the union movement, such as intimidation and links with organized crime, I've been sympathetic to the concept of organized labor. I'm aware that the advent of the industrial revolution didn't immediately improve the

lot of working men and women. Accounts of resistance to improvement, through use of police and armed company cadres, repelled me. I have a shrewd suspicion that had I been born earlier, I would have found myself at the end of a pick or shovel, rather than enjoying an education and spending my life in professional and managerial ranks. My sympathy for physical workers and their right to organize was not something newfound when I became responsible for labor relations.

At this meeting in November of 1981 we started off with a talk about the condition of the company, problems we were likely to face, and what had to be done to survive. Frank McKee responded in a conciliatory manner. We had lunch, after which the meeting broke up into groups. The next couple of days were spent discussing issues unions felt uneasy about, and changes management felt would be logical, economical and amenable to implementation without major contract revisions. The feedback from the unions was positive. Bob Woody reported on it favorably in the press.

Swent: Why did you choose Phoenix for the place?

Joklik: The unions chose it, probably because of the climate.

Swent: Where was it?

Joklik: Not at one of the posh resorts, I can assure you. Both sides agreed that this conference should become an annual event. A schedule of intermediate meetings during the year was set up as well.

I previously mentioned the Supervisory Skills Training Program for front-line foremen which was well received. I also described the Millwright Agreement, which was a breakthrough in labor relations for the copper industry.

Before you knew it, we were in the latter part of 1982 and our thoughts turned to what was likely to happen when the copper industry contracts expired in 1983. In the meantime, we had asked the unions for concessions at our Ozark, Missouri, lead operations because the lead price had plummeted and we were losing money hand over fist. We approached the union, and they said, "No." We, therefore, shut down Ozark Lead on March 4, 1983. This was a separate issue that didn't spill over to the copper negotiations.



## 1983 Negotiations; Employment Security Plan Eliminated

Joklik: It was clear that our major copper contract issue was going to be the Employment Security Plan [ESP]. This clause in the contract provided that workers idled by redundancy or technological change should continue to be paid until recalled or retired. Since we'd already reduced our work force by 30 percent, invocation by the unions of the ESP provision would have been crippling for the company. I had a number of meetings with Frank McKee. The Steelworkers held a national meeting at Bal Harbor in Florida. Frank asked me to come down and meet a few of his people. I remember one warm, windy evening when he and I went for a long walk. He told me what he thought he could and couldn't go along with in the 1983 negotiations. He said he was prepared to help us with the ESP because he accepted that our operations were otherwise going to go down the tube. At the same time, he couldn't do anything about taking COLA out of the contract. For us, ESP was a bigger issue, a fact we couldn't advertise because of our already accrued liability. Phelps Dodge's bloody confrontation with the unions over COLA received much publicity, but gained for that company much less than our savings from ESP did for Kennecott.

For ESP we substituted a "technological benefits plan," funded in the amount of \$7.5 million, which was insignificant compared to our potential liabilities under ESP.

Swent: So, this was a fund that was set aside to be available for technological redundancy.

Joklik: Right.

Swent: And when that was gone, it was gone.

Joklik: It was spent almost overnight.

Swent: Whereas the ESP would have been an ongoing thing.

Joklik: Forever.

Swent: I see.

Joklik: For the first time in twenty-five years, Kennecott and its unions benefited from a strike-free settlement. We were relieved, since a strike would have disrupted our cost reduction program.

### Concession Bargaining; Shut-Down of Utah Copper

Joklik: The copper price was still dropping towards that rock bottom of fifty-five cents a pound. As our losses approached a rate of over \$100 million a year, we decided to go to the unions for concessions, prior to the next contract expiration. We put forward a proposal early in 1984 and told the unions that if we did not get concessions, we would have to partially shut down Utah Copper. They denied our request to meet. We therefore curtailed production at Utah Copper by two-thirds in July, 1984, keeping only the most modern of the concentrating facilities supplied with ore. The Bonneville crushing and grinding facilities, with the most updated sections of the flotation plants at Magna and Arthur, were the lowest cost units of the Utah Copper concentrators and were kept in operation.

In January 1985, we and several other copper producers finally did meet with the unions at Albuquerque. They, again, refused to enter into serious discussions for concessions. The ground was cut from under us by Asarco representatives who made the unions an offer involving give-backs of concessions. The union seized on this and wanted us to follow suite. When we said, "No," they withdrew from the agreement with Asarco, too, and the whole effort cratered.

We then proceeded shutting down the remaining facilities at Utah Copper. By March 1985, the shutdown was complete, with the exception of a maintenance force of 250 people. In the meantime, I established a dialogue with Lynn Williams, who had succeeded Frank McKee as president of the Steelworkers. Lynn was a lawyer, a low-key negotiator in small groups and an effective orator in larger gatherings. I got him to agree that when we came to the 1986 negotiations, he and his staff in Pittsburgh would not interfere. He agreed, partly because he was apprehensive that his involvement in concession bargaining with us would rub off on his union's membership in the steel industry which vastly outnumbered his membership in the copper industry.

Swent: Did this work better for you?

Joklik: Well, that was what needed to be done. And I suspect it jibed with the wishes of the regional leaders, Bob Petris and Wayne Holland. They wanted to paddle their own canoe, rather than being dictated to from Pittsburgh.

## 1986 Negotiations; 30 Percent Hourly Cost Reduction

Joklik: Well, the 1986 negotiations were colored by corporate politics. You know, Standard Oil bought Kennecott in 1981. And Standard Oil was owned 45 percent by BP. Oil prices crashed in 1985 and, in the eyes of BP management, the people at Standard Oil appeared unable to handle this crisis.

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Joklik: BP stepped in and changed the management of Standard Oil, whereby Al Whitehouse and John Miller left and Bob Horton of BP took over as president of Standard Oil. The change was effected by Peter Walters, who had become chairman of BP a year after Standard Oil's acquisition of Kennecott.

Swent: Now, you were also a vice president of--

Joklik: Senior vice president of Standard Oil and president of Kennecott.

Swent: Right.

Joklik: Bob Horton was forty-six years old at the time and had been in charge of BP's chemical business. He was a personable, confident, ambitious man. I found him willing to stick his neck out and make decisions, which was not always a characteristic of his colleagues. I had a good relationship with him which lasted until his much publicized departure from BP, some years later.

By the time we came to the 1986 labor negotiations, BP wanted to be involved. I believed that we should not use the modernization as a club in negotiations. There was no need to. I said to the union leaders, "We're going to build this new plant, and we will operate it with or without a unionized work force. The modernization will proceed." On the other hand, people in London tended to say that if the unions didn't come to the party, the modernization would be stopped. So, there were two different messages being passed. My point of view ultimately prevailed.

Swent: So, you still were shut down at the time of the negotiations?

Joklik: Yes. But Ray and Chino were operating.

What motivated us, in the 1986 negotiations, was simply this. In order to survive, we had been cost-cutting for the preceding five years as aggressively as we knew how. We had reduced the work force to a minimum. What we still needed to address was the high unit cost of labor. I mean both wages and

benefits. We had set ourselves a target of a 30 percent reduction of the hourly labor costs, to come from savings in wages and benefits and from changes in practices that would permit our employees to fully utilize their skills in their places of work. In other words, the minutes of useful work done by each employee per hour would increase.

Swent: Until now, you've cut your labor force, but not your labor costs.

Joklik: Exactly. That's what I mean by the start of concession bargaining.

### Securing the Perimeter

Joklik: We made it clear to our workers early in 1986 that we intended to keep operating if there was no settlement from the negotiations. We stated that we intended to implement our last offer. If we had insufficient employees, we would hire employees from the outside. We took measures such as fencing off the operations and limiting access to certain gates. Long before the deadline, we brought in accommodations, kitchens and temporary office buildings, so that each mine could be run within the perimeter of its property and be protected from violence. These preparations were highly visible.

We held our kick-off meeting with the unions in Phoenix on February 3rd, and presented our initial proposals. A point we made repeatedly was that, even with a reduction of 30 percent in hourly costs to the company, wages and benefits paid by Kennecott would still be competitive with what was customary for comparable work in the Salt Lake area, in Arizona and in New Mexico. It was then agreed that negotiations would proceed at the local level. One of our aims, and I'm not sure it wasn't also the unions', was to reduce the proliferation of contracts, forty in all, to a single master contract, with supplementary provisions for individual locations.

### Open Town Meetings

Joklik: We concerned ourselves with communicating our position to the membership. We decided to have open town meetings at each of the operations with all the employees. At each location, we met first with the union leadership. We'd then hire a large hall and invite all employees and their spouses to attend. We started off with



Utah Copper out at Kearns High School, where Kennecott had, years before, financed the construction of the auditorium. About 1500 people turned up. On the podium, I had Judd Cool on one side and Ken Vance, who had succeeded Wally Jensen as General Manager, on the other. I should comment that some time after Wally and I worked on the last major work force reduction of 900 people, he came to my office and said, "Look, I'm going to resign." I asked, "Why, Wally, what's the reason?" He just said, "I want to do something else. I've had enough." He didn't ask me for one red cent. He just cleaned out his desk and left. I saw him occasionally afterwards, and we remained friends until he died of cancer several years ago.

We had prepared a video of the consequences of not reaching a settlement, namely permanent shutdown. It was produced by a small company in Georgia, Paul French and Partners, that had a name for being innovative and cost effective. It was actually a slide show, with seven or eight projectors and an excellent sound track. They'd hired a superb narrator who told our story convincingly. At our meetings, we'd show the video first and then call for questions. We'd stay for hours, until the last question had been asked. As expected, we got some hostile comments, some abusive. I knew that, being up there on the stand, the one thing we had to do was maintain our cool. I found I could answer questions candidly, without anyone getting too agitated.

They were good meetings. Although the attitude of many in the audience was adversarial, there were others who commented favorably on the company and management. This was particularly true of some wives who were concerned about their husbands being out of work and didn't want the shut-down to be protracted indefinitely. Some of these women were pretty courageous and articulate.

We had three meetings for Utah Copper. We then went on to Arizona and had two meetings at Ray. At Chino, we had a bomb threat halfway through one of the meetings. We stood outside for an hour while the police searched the building, and then resumed the meeting. I think those meetings contributed importantly towards the ultimate settlement.

### **Final Offer Rejected**

Joklik: The negotiations dragged on until after midnight of the expiration date on June 30. Our final offer included what we had intended, a 30 percent reduction of wages and benefits. On that last evening

in Phoenix, the communications between the two sides were fast and furious. The union finally rejected our offer. Our last card was to propose a \$1,000 ratification bonus, to be paid to each eligible employee. We knew that this would have impact with them and their families. Most importantly, we agreed to begin, immediately after a settlement, preparations to bring Utah Copper back into operation, the only caveat being that if copper prices dropped below 55 cents a pound for a protracted period of time, we would not be committed.

Nothing happened at midnight. There was no word back from the union. We were there at one a.m., two a.m., three a.m.; and then, at four-thirty in the morning, there was a call from Bob Petris saying the Union Committee would not accept our offer, but would not stand in the way of it being put to a vote by the membership.

Swent: Hmm.

#### Membership Ratifies Four-Year Contract

Joklik: Well, to us that was positive. We were confident the unions would ratify a new contract comprising our final offer. And on July 9th, the union membership voted in favor by a two-to-one majority.

The economic effect on Kennecott was major. Cost-savings amounted to seven cents per pound of copper. The unions also were able to portray the outcome as satisfactory because of the promised start-up of Utah Copper. The press lauded the settlement. The morale of the work force that returned to Utah Copper was high.

Swent: You got out of COLA?

Joklik: Yes. COLA was eliminated. Although inflation rates had dropped, retaining COLA in the contract would have endangered gains from lower wages and benefits.

Swent: And I also thought that it was interesting that you increased the spread between your low wages and--

Joklik: Yes. There had been "compression" between job classifications, due to the functioning of COLA. In the new contract, the spread was broadened so as to recognize the relative values of job skills. This provision helped boost the morale of the work force.

Swent: Right. So you both won. I mean you both felt that you did.

Joklik: Yes. This was a four-year contract. It was the first time that the life of a contract had been extended beyond three years. The extra year permitted longer range planning and broke the lock-step with our competitors in the labor negotiating cycle. We immediately commenced preparations for the start-up of Utah Copper. Over the next nine months, we brought on the mine, the concentrator and the smelter at a production rate of 60,000 tons of ore a day--again using the more modern parts of the concentrating facilities. Morale was high, costs were low, Ray and Chino kept on operating--

Swent: You had good weather--

#### Forced Sale of Ray and Chino

Joklik: I don't recall what that winter was like, but it was certainly better than the winters of 1983-84 and 1984-85. The only sour note was that the management of Standard Oil, with the backing of BP, forced the sale of Ray and Chino.

Swent: That must have been a big disappointment to you.

Joklik: I fought it at stormy sessions in Salt Lake and in Cleveland. Tom Barrow had retired in 1985. Responsibility for Kennecott was passed to Frank Mosier, a senior vice president of Standard Oil. Frank seemed to dislike Barrow and resent the acquisition of Kennecott. He was bright and articulate, but also irascible and inconsistent. He had little knowledge of the mining business, and tended to compensate for his ignorance by oversimplifying complex issues. This didn't always provide the best solutions to problems. It became apparent to us that he favored dismantling Kennecott and selling off the pieces.

#### Sohio's Wrong-Way Bets on Prices

Joklik: The divestiture of Ray and Chino was decided in Cleveland on Mosier's theory that copper prices would never rise again. You see, when I first became involved in petroleum industry issues, as a senior vice president of Standard Oil, I asked what would happen if, one day, crude prices dropped below \$30 a barrel. Mosier responded that if oil dropped to about \$26 barrel, the U.S.

Government would step in to protect the domestic petroleum industry by setting a floor price. When I asked whether Standard Oil kept current on exploration, development and production costs of competitors, as we were accustomed to doing in the copper industry, I was told there was no need to gather such information. Uncle Sam would take care of things.

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Joklik: The Standard Oil planners in Cleveland developed a theory that copper prices were going to indefinitely move in a narrow band, the lower limit of which was defined by the costs at which the marginal producer would shut down. This was estimated at \$.55 a pound. The top of the band was the price at which substantial new capacity would start to be brought on stream. This was thought to occur at \$.80 per pound. For planning purposes, an average price of \$.60 a pound was to be used. In fact, in one of their documents was a statement that copper prices would not rise above \$.60 a pound for the remainder of the decade.

Since the economic future of Ray and Chino appeared unattractive to Standard Oil, the decision was made in Cleveland to sell these properties at whatever the market would yield. As we all know, towards the end of 1986, Ray was sold to Asarco for \$73 million and Chino was sold to Phelps Dodge for \$92 million. You can imagine our dismay, considering that \$400 million had just gone into the modernization of Chino. Some price participation was included in the sales contracts, but the total received was a drop in the bucket compared to the subsequently demonstrated value of these properties. We felt even worse because of the agreements we had just reached with the unions. They had put their faith in Kennecott and instead, they unexpectedly found themselves with new masters whose intentions were hard for the employees to predict.

Phelps Dodge and Asarco, our traditional competitors, benefited from our divestitures, at a time when their production costs were still relatively high, and their financial condition was consequently weak. Phelps Dodge had gone non-union in the aftermath of their confrontation with their unions in 1983, when we succeeded in unshackling ourselves from the onerous provisions of the Employment Security Plan. But their non-union wage rates were higher than the rates we implemented with our unions after June 30, 1986, and they were pleased to inherit the new labor agreements that resulted from our careful preparation and hard work. Our frustration at aiding our competitors seemed to be lost on the Standard Oil management in Cleveland.

Ozark Lead was virtually given away to Asarco, and KRC was sold to Tom Murphry, our former vice president of sales.



Swent: So, you stripped down to--I've lost track of Nevada. What happened to that?

Joklik: Good question. Mining ceased at Nevada in 1979. The smelter was kept operating with custom material for some time. But, because of the isolated location of this plant and environmental restrictions that required compliance with the Clean Air Act of 1970, the smelter was shut down not long afterwards.

Swent: So you got down to just the one operation.

Joklik: Except that, in the meantime we had already discovered or acquired other properties which I'll talk about later.

The startup of Utah Copper, prior to the completion of modernization, went better than expected. As a result of the cost reduction efforts prior to shut-down, and some repair work and modifications carried out while the operation was idle, the production costs after startup turned out to be less than half of what they were in 1980, in real terms.

#### 1990 Negotiations; Give-Backs Resisted

Joklik: By the time the four-year labor contract expired in 1990, Judd Cool had left the company and been replaced by Don Babinchak. Don, like Judd, was a professional in the human resource field, with plenty of experience in industrial relations. He was a decisive individual, very much able to hold his own in any negotiating setting. Also, he had an exceptional ability to structure organizations as living entities. He would recommend changes whereby everybody affected benefited by an expansion of their experience and responsibilities. He was a trusted colleague. Don masterminded the 1990 negotiations, in which the unions vowed that they were going to get back the concessions they had made in 1986. By 1990, of course, the copper price was far higher than it had been in 1986. It was no longer possible to plead the threat of a permanent shutdown, as we had, in all sincerity, in 1986. On June 30, 1990, the parties concluded a strike-free labor settlement with a new three-year contract. Although there were some changes in the wage rates and benefit provisions which benefited the unions, the 1990 contract broadly continued the terms of the 1986 settlement.

### Respect for Hourly Employees

Joklik: As you know, I retired from Kennecott in May of 1993, shortly before the expiration of the 1990 contract.

I'd like to say a word or two about Kennecott's hourly paid people. In my visits to the various Kennecott operations, I had conversations with--and befriended--many hourly employees. The town meetings that were held prior to the 1986 contract expiration, and subsequent contacts, highlighted their concerns, particularly about their pension and medical benefits. Before I retired, I went out to Utah Copper and individually said goodbye to hundreds of them. There wasn't one who had anything but kind words to say. I was also rather touched when I had a call from Bob Petris. In full flight during negotiations, Petris was a formidable opponent. At various times, he and I used the capacity of our lungs to make our points. But now he called me to say he was sorry to see me go and that, all along, he'd felt he could trust me. I said the feeling was mutual, and meant it.

Swent: That may be the ultimate compliment.

### Investment in Chino Operations

Joklik: Now, to change the subject. I already set the stage for discussion of the modernization of Kennecott's copper operations when I discussed Kennecott's engineering capability. We hired Roman Rao and others to replace the previously ineffective central engineering group. Back in 1979, there wasn't much disagreement among Tom Barrow, Glenn Bakken, Bill Wendell and the rest of us that the modernization of Kennecott's antiquated production facilities was desirable. While I was still in my job as a senior vice president Technology, we put together a plan for the modernization of Chino, by expanding the mine and building a new concentrator. I went to the Kennecott board in November of 1979 with a proposal to raise the mine and mill capacity to 37,500 tons of ore per day, and scrap the existing facilities of Panama Canal vintage that had a capacity of 22,000 tons per day. We proposed the installation of a 54" x 74" primary gyratory crusher, a coarse ore conveyor and stacker, and two grinding lines, each consisting of a 28-foot SAG mill feeding two 16-1/2' x 19' ball mills. The flotation plant included 1,000 cubic foot cells which, like the SAG mills, were fairly new technology at the time. The capital cost estimate was \$284 million including owner's costs, working capital and escalation. The preparation of comprehensive,

reliable cost estimates was something new at Kennecott. Hence the previous history of unpleasant surprises with major projects. I had already learned my lesson from the Mt. Newman project.

### Mine and Concentrator Project

Joklik: The Chino project was expected to save 20 cents a pound of copper in operating costs and increase copper sales by 60 percent. The operating work force was expanded by only 5 percent. The elimination of the rail haul from the mine to the old concentrator at Hurley was a major contributor to cost reduction. This was common to all Kennecott Copper operations: the old concentrators were constructed some distance from the mines, generally because of the remote location of water sources.

Swent: So this new concentrator was closer to the mine.

Joklik: Yes, but there wasn't much room. The concentrator had to be shoe-horned into a small area between the natural topography and old waste dumps. It was an interesting engineering exercise to lay out the concentrator and support facilities, and still have enough room for temporary facilities during construction.

Swent: What about the water?

Joklik: Water is reclaimed from the tailings pond and pumped from a well field. Both were expanded.

Swent: And what happened to the concentrates?

Joklik: A concentrate slurry pipeline and two tailings pipelines were constructed. The distance to the smelter and tailings pond was about eight miles.

Swent: You were changing from rail to truck, right?

Joklik: No. The pit had already been changed to truck haulage. To match the increased ore production, we replaced the truck fleet with larger units.

Swent: So, the project began in 1979.

### Joint Venture with Mitsubishi

Joklik: Yes. The question was where the \$284 million was going to come from? I had friends in Mitsubishi Corporation with whom I had maintained contact since my Mt. Newman days. They came to see me and expressed interest in possibly participating in the Chino project. We negotiated an agreement, whereby they would acquire a one-third interest in the Chino operations, by contributing the first \$116 million of the funds required for the modernization project and one-third of the rest. They would be entitled to take one-third of the output of the operations. Kennecott retained management and undertook to electrolytically refine Mitsubishi's share of the output at KRC in Baltimore. Chino had only a fire refinery and the wirebars produced were rapidly going out of favor with fabricators. I negotiated this deal with Mr. Yamamoto of Mitsubishi, who became a friend of mine. He was the son of Admiral Yamamoto of World War II fame. Chino didn't have that smooth a path after the modernization was completed, because of the continuing decline of copper prices. Quick returns from the money invested in modernization weren't immediately realized. But, Mr. Yamamoto and his colleagues displayed a forbearing attitude in the face of disappointing results.

The project was started in the last quarter of 1979. Bechtel was hired as engineering contractor and construction contract manager. Our close supervision of their work saved us from paying for a cost overrun which we foresaw before Bechtel did. The project was commissioned in October 1982. By then, copper prices had dropped to rock bottom. Although the work was completed ahead of schedule and within budget, there was no cause for celebration. I remember one sunny day showing Senator Pete Domenici over the new facilities. He was full of admiration for what he saw, but the poor copper market conditions put a damper on the occasion.

### Smelter Project

[Interview 5: January 22, 1994] ##

Joklik: The partnership agreement with Mitsubishi provided that, to complement the mine and concentrator modernization, a new smelter with a capacity to treat 500,000 tons a year of concentrates would be built. The cost was to be shared two-thirds Kennecott and one-third Mitsubishi. This final phase of modernization would have started earlier, had it not been for the need to negotiate an



agreement with the state on environmental aspects of the project. The old smelter was capturing only 60 percent of the sulfur dioxide produced; the plant was meeting the ambient air standards by periodically curtailing production, and operating with a dispensation from regulations under a Non-ferrous Smelter Order. But now the time had come to meet the new State Implementation Plan (SIP) regulations of New Mexico dealing with SO<sub>2</sub> and particulate emissions.

Swent: So you were given a time in which to comply.

Joklik: Yes. That's what finally triggered the go-ahead with the smelter project. We reviewed alternative technologies and quickly discarded the Noranda process, in light of our experience with it at Utah Copper. Mitsubishi was pressing strongly for their technology. We finally selected the INCO flash smelting system, whereby sulfide particles in concentrates are injected into the smelting vessel and burned in a stream of oxygen. The capital cost was estimated at \$126 million. Because the existing smelter was able to treat only one-half of the output of the new concentrator, the smelter project was justifiable both economically and environmentally. Apart from improved operating efficiency, major savings came from avoiding the cost of shipping the excess concentrates to smelters elsewhere.

Swent: Was there any factor other than the environmental regulations? Was it the same chemistry of ore that you'd had before, or was there a change?

Joklik: No.

Swent: Did you retrieve anything that you could sell? Does sulfur--

Joklik: Yes. The smelter project included a new double contact sulfuric acid plant. You convert sulfur into sulfuric acid, and then you have to find a home for the acid. It's a question of how far you have to rail or truck it to find a market. In the United States, the most important market for sulfuric acid is the fertilizer industry in Florida and the Midwest. If you can't find an outlet for chemical or other uses closer to home, you have to buy more tank cars and rail the acid out. There are times when the fertilizer industry is weak, the demand for sulfuric acid therefore declines and rail costs exceed the price of acid. You then incur a negative net back on the sulfuric acid produced. I believe that was the situation at Chino.

Kennecott's two-thirds share of \$126 million was \$84 million. Standard Oil had bought Kennecott not long before. This was the first request for major capital funds related to Standard

Oil's newly acquired copper business. Considering the operating losses we were already incurring, this was rubbing salt in their wounds. Our first presentation to the Standard Oil board, in July of 1982, was not well received. Our request was turned down. We went home, regrouped and returned to Cleveland in September. This time, we had our case better prepared and the project was reluctantly approved.

Swent: Had you negotiated this arrangement with Mitsubishi before that?

Joklik: The construction of the smelter was part of the original agreement. The principal contractor for the project was Stearns Rogers of Denver. They did a good job, under the supervision of Raman Rao and his team. The project was completed on schedule, within budget, started up in October of 1984 and reached full production in the first quarter of 1985. We were then able to smelt all of the concentrates produced at Chino and to meet the environmental regulations. That completed the modernization of Chino.

I think I mentioned before that we had in mind building an SX-EW plant to replace the precipitation plant in which the copper from the dump leaching operations at Chino was being recovered. We had a design and cost estimate prepared. Had the forced sale to Phelps Dodge not taken place in 1986, that project would have been carried out by Kennecott.

Swent: Did PD go ahead with that SX-EW plant then?

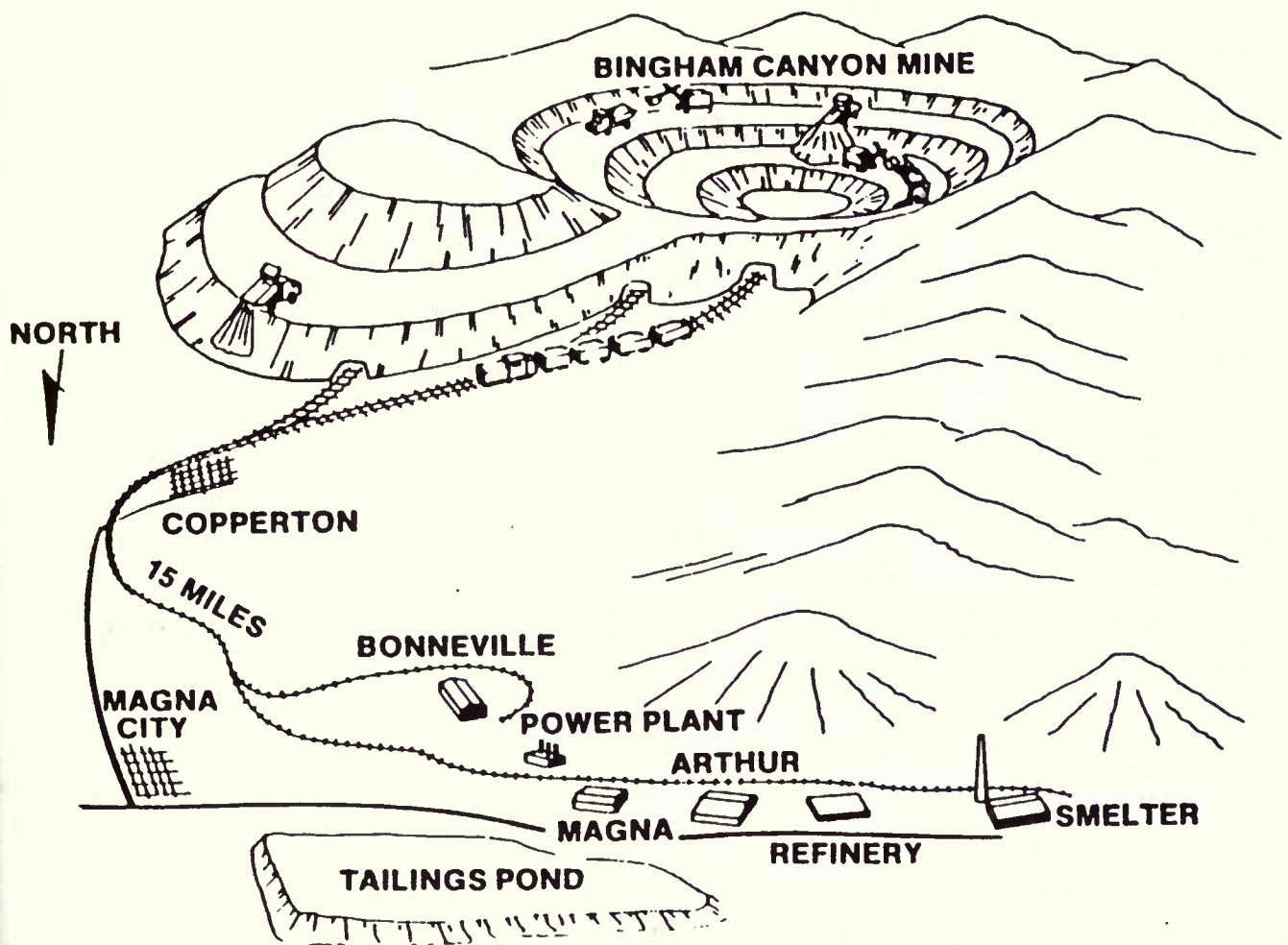
Joklik: I believe with a modified plan, yes.

The modernization of Ray Mines was considered. The installation of a new leaching system for the silicate ore improved the economics of that operation over and above the cost reduction measures that were implemented in the early 1980s. But, when it came to contemplating further expenditures on modernization of copper operations, it was clear that Utah Copper should have priority because of the potentially larger gains. This is what I'd now like to talk about for a few minutes.

#### Modernization of Utah Copper

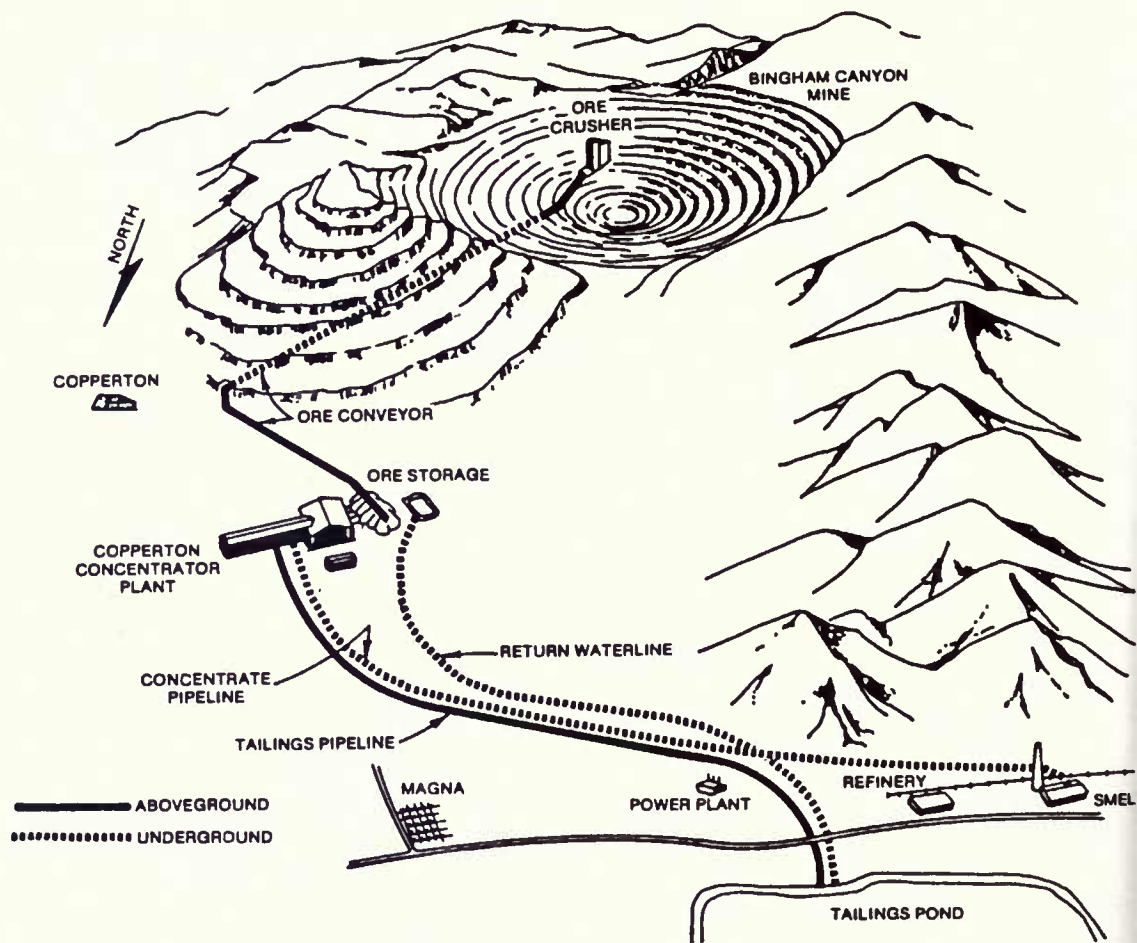
Joklik: When I initially looked at the shortcomings of Utah Copper in 1980, the first thing that struck me was how previous piecemeal attempts at modernizing the operation had not achieved the desired results. It was difficult to see how the Bonneville crushing and





Utah Copper facilities in 1985 before modernization.





Utah Copper facilities in 1988 after modernization.

grinding plant, which was built to supply supplementary feed to the old Magna and Arthur concentrators, could have been expected to have a lasting beneficial effect.

### Stem to Stern Approach

Joklik: We put together a team to study a modernization plan for the whole ship from stem to stern, starting from the mine and going right through to the refinery. We could see that the mine, with the substitution of truck for rail haul completed, would be in reasonable shape; that if we could just see a way of shifting the concentrating operations closer to the mine, rather than leaving them at the end of a nineteen-mile rail haul, fragmented between three plants (Bonneville, Arthur and Magna), we would achieve a major breakthrough; that the smelter, after the expenditures of the 1970s, was still limping along, substantially in compliance with environmental regulations, but still beset by severe operating problems; and that the refinery, of relatively more recent vintage (it was built in the early 1960s) had been reasonably well maintained.

Swent: Just for the record, the location of the smelter and the refinery.

Joklik: They are west of the concentrators. I intend to include a sketch with some of these locations shown.

Swent: These plants were built at different times and at different locations; they were scattered all over the place.

### Concept of New Concentrator at Copperton

Joklik: Yes. As I said before, the reason for the concentrators being far from the mine was the availability of water. The well fields on the shore of the Great Salt Lake pumped water for the concentrators and determined their location. Early this century, pumping water over long distances had not been accomplished much in this country, as opposed to Australia where a man named O'Connor had just built--or was in the process of building--a 400-mile water pipeline from Perth on the west coast to the Kalgoorlie gold fields. He was a brilliant engineer; he made just one error. If I recall correctly, when they started pumping water through this 400-mile pipeline, he miscalculated the time it would take

for the water to reach Kalgoorlie. When the water didn't arrive as he expected, he shot himself. The water came within hours.

Swent: So, nineteen miles wasn't so much.

### Overcoming Conventional Wisdom

Joklik: No. Conventional wisdom was that there was no way a suitable site could be found for a concentrator close to the mine, partly for the reasons of unsuitable topography, but principally because it was thought that the requisite environmental approvals couldn't possibly be obtained. We began talking to the state authorities. A host of permits certainly did have to be obtained, but we were assured that, provided the plant was designed for zero discharge of effluents at the site, there was no insurmountable obstacle to locating the plant near the mine. We went to work on a conceptual design and selected a site only five miles from the mine, which was partly on Kennecott land.

As early as February of 1982, we went to the Standard Oil board to request \$20 million to acquire the necessary land for the location of the new concentrator. The request was approved and over the next couple of years we bought the pertinent parcels.

Swent: This was at Copperton.

Joklik: Yes. The concentrator location is three miles north of Copperton, on land which slopes gently to the east along the foothills of the Oquirrh range. It's an ideal site for process flows.

Swent: So the obstacles were funding or environmental?

Joklik: We found the environmental obstacles could be overcome.

Our next step was to identify the throughput rate which would best match ore production to equipment types and sizes in the concentrator. We developed eighty alternatives based on several variables. Our attention was focused on selecting the cut-off grade which should be used for establishing the ultimate pit limits and, implicitly, the magnitude of the remaining ore reserves and mine life. Since the Standard Oil management believed they had overpaid for Kennecott, it was difficult to persuade them to consider mining higher grade ore and less tonnage. We ran through our alternatives during numerous meetings and discussions with Standard Oil management and rarely found ourselves in agreement.

Swent: Was this partly because of the difference between oil and mining?

Joklik: Well, I suspect it was their concern with being seen as having paid too much for Kennecott. You're right, it was difficult for people who had spent their lives in the oil industry to quickly pick up the essence of the mining business, in which you deal with much longer time horizons.

Swent: Did you have any partisans on the board?

Joklik: No. Standard Oil, under Tom Barrow's direction, was stepping up exploration for oil in the lower forty-eight states to a much higher rate of expenditure than had been done previously. To us, the funds required for this escalated effort were enormous. I had the opportunity of visiting a couple of their newly established and staffed exploration offices, in Houston and Denver, and was much impressed by the people they'd hired and the sophistication of the state-of-the-art equipment. Unfortunately, the rate of discovery did not match the magnitude of the exploration budget. I attended one board meeting at which Bill Rogers, the former secretary of State, asked pointed questions about the return on investment in exploration. The turning point came when, apart from the disappointing results in the lower forty-eight, an extremely expensive well off-shore from Prudhoe Bay in Alaska turned out dry. This well, called Mukluk, had been touted as a virtual certainty and diminished Tom Barrow's credibility in the eyes of some Standard Oil managers.

Anyway, the competition for funds explains why a major investment in the modernization of Utah Copper was not regarded favorably by the oil company in the early 1980s.

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Swent: Kennecott was lower on the pecking order.

#### Threat of Abandonment

Joklik: Yes. We were able to demonstrate a handsome return on the investment in modernization, provided Bingham Canyon continued operating. This concept had to be dealt with first, because there were people on Standard Oil's management who thought Bingham Canyon would be better shut down and abandoned, with the abandonment and reclamation costs written off promptly. They were saying, "It's time to bite the bullet now, rather than throwing good money after bad."



Swent: Write off a bad deal.

Joklik: Yes. That was a threat which, looking back today, is hard to understand. But if you consider what the environment was then, depressed copper prices, a deep recession, declining oil prices and the poor results from Standard Oil's expenditures on domestic oil exploration, it's not implausible that there was substantial support for shutting down and abandoning Bingham Canyon.

### Design to Match Cut-Off Grade

Joklik: The design we had developed by 1984 was for a concentrator throughput rate of 77,000 tons a day, based on a pit envelope matching a cutoff grade of .45 percent copper. The operating cutoff grade would, of course, be adjusted as metal prices warranted. (We have since then operated with a cutoff grade as low as .25 percent copper.) The capital cost estimate for this project was \$572 million, expressed in 1984 currency. The scope included an in-pit crusher and conveyor system that would eliminate double handling of ore. Mined ore was previously hauled by truck or rail to stock piles within the pit and reclaimed for the rail haul to the Copperton marshalling yards, where trains were made up for the nineteen-mile journey to the old concentrators. The modernized facilities would provide for conveying ore directly from an in-pit crusher, through the lowest tunnel in the canyon, to the new concentrator east of Copperton. The concentrator would comprise ore stockpiling and reclaim facilities, three grinding lines, each including a thirty-four-foot SAG mill and two eighteen-foot diameter ball mills and a flotation plant featuring 3,000 cubic foot cells. This state-of-the-art equipment would replace the hundreds of small, antiquated units in the old concentrators.

### The Campaign for Funding

Joklik: Before I go further, I should comment on the capital cost estimate. You see, we had tested the waters and found that we weren't going to be able to get \$572 million from Standard Oil. Allowing for escalation, we were actually talking about \$680 million. After some intelligence gathering around Cleveland, we concluded that nothing over \$400 million would fly. I know that's doing it the wrong way around, but we had to face facts. The people in Cleveland who were looking over our shoulder said we

should just build crushing and grinding facilities at Copperton, transport slurried ore by pipeline to the old concentrators and retain the more modern sections of the existing flotation plants. This, they claimed, might reduce the capital requirements to within "acceptable" limits.

Swent: So, the politics of the situation were that you needed to do it in increments?

Joklik: Well, unfortunately they weren't talking about increments. They regarded this as a long-term solution. It looked to me like the half-measures of previous attempts at modernization of Utah Copper. We nevertheless estimated the cost of this plan. It amounted to \$398 million, in dollars of the day. The economics of the project were driven by potential cost reductions. We calculated there were a thousand jobs that could be eliminated by installing a primary crusher in the pit, building a modern crushing and grinding plant at Copperton, thereby replacing the much smaller equipment in the Bonneville, Magna and Arthur concentrators, and eliminating the nineteen-mile rail haul to the existing concentrators.

We had a philosophical problem. You see, to calculate the profitability of any project, you have to have a base case with which to compare the economics of the plant that's going to be built. The question was, "What do we use as the base case?" People in Cleveland, particularly Frank Mosier, insisted that we use a theoretical base case of putting 77,000 tons a day through the existing concentrators. We would then calculate the cost savings from putting the same volume through the modernized plant, and the cost savings, compared to the base case, would provide the return on investment. Well, we thought this was a little deceptive because there was no way the existing concentrators could still treat 77,000 tons a day. I mean, our experiences in the winters of 1983-84 and 1984-85 showed the limitations of what could be done. We thought it would be much better to just come out and say, "We've reached the end of the road with trying to continue operating the way we are. This project has to be done or you abandon the operation." We worked out the economics of abandoning Bingham Canyon. We figured that abandonment would yield substantial tax benefits, offset by the need to immediately address reclamation. And this was attractive to a number of the people in Cleveland.

Swent: So that was actually openly considered.

Joklik: Oh, yes. At stormy meetings in which the BP people, the 53 percent shareholders of Standard Oil, actively participated.

After numerous discussions at lower levels, we made a final presentation to the BP board in London in December 1985. The project was approved.

Swent: This was the \$398 million level?

Joklik: Yes, with just crushing and grinding at Copperton, not flotation.

What helped the Standard Oil and BP people view the project favorably was that the Utah State Legislature had agreed to give us tax concessions after an intensive lobbying campaign on our part. Governor Bangerter was still the speaker of the House at that time. It was largely his understanding of our need and his leadership that caused the legislature to approve relief from sales and use tax for the equipment and supplies to be used in the modernization project. I believe this measure provided a savings of about \$20 million. The positive attitude of the state government impressed our owners.

#### Low Bids Permit Expanded Scope

Joklik: Detailed engineering on the project then began. When we went out for bids, the engineering and construction industry in the United States was in a deep recession. We were pleasantly surprised by the quotes we received for the seventy packages we'd cut the project into for bidding purposes. We soon realized that the estimate of \$398 million, for the scope as defined, could be substantially cut. We also found that upgrading the flotation facilities at the Magna and Arthur concentrators would be more costly than we had anticipated. The thought then occurred to us that, with the higher cost of providing for flotation at Magna and Arthur, and the generally lower costs of project components as indicated by early bids, we might be able to add to the scope by installing brand new flotation facilities in the Copperton concentrator. We recognized that this entailed risk because we sensed that Mr. Mosier and his associates would favor taking the savings from lower construction costs, diverting them to other uses and staying with the original design.

About that time, the change in management of Standard Oil to which I've already referred took place in Cleveland. Robert Horton took over as chairman. He carried out a reorganization as a result of which Colin Webster, another former BP executive, became responsible for Kennecott, replacing Mosier. We showed him the logic of combining flotation with crushing and grinding at Copperton, within the overall budget already approved. He

indicated that he would go to bat for us and help win support for our concept in Cleveland and London.

We prepared a revised cost estimate to provide for this change of scope and came up with \$394 million for an integrated concentrator at Copperton. After some contentious meetings in Cleveland, at which our campaign was described as aggressive, the Standard Oil board approved the modified project in December of 1986.

Swent: So you got what you wanted and it cost even less.

Joklik: Yes. We could just foresee all kinds of difficulties in operating a concentrator split between two sites. We didn't have confidence that, no matter what we did to upgrade Magna and Arthur, the process could be controlled as effectively as it could in an integrated facility.

Before proceeding with the project, we took six months to scour the world for refinements that would support our claim to having incorporated state-of-the-art technology in the design of the facility. Detailed design of the concentrator then went ahead, with Bechtel as the engineering contractors and Stearns Roger as construction contract managers. Raman Rao and his team provided supervision. Al Nuttal was our project manager.

#### Concentrator Construction Completed

Joklik: Construction was favored by exceptionally mild winter weather in 1986 and 1987, and the project was completed ahead of schedule and well under the cost estimates in October of 1988.

Swent: To much acclaim.

Joklik: Yes. By October we had already exceeded the target throughput rate of 77,000 tons per day. And the throughput was subsequently further enhanced, so that by 1991 we were milling at a rate of 86,000 tons a day.

Swent: Fantastic achievement. From possible abandonment to more than 80,000 tons per day in a few years.

Joklik: Before completion of the project, BP took over the remaining 47 percent of Standard Oil. We had an opening ceremony in September of 1988 at the project site, outside the completed concentrator.



It was attended by BP and Standard Oil Management. It had been raining.

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Joklik: And then, lo and behold, on the morning of the 23rd of September the heavens parted and there wasn't a cloud in the sky. It was possible to have an outdoor gathering in brilliant sunshine. Eight hundred of our best friends attended. Lunch was served and a good time was had by all. Governor Bangerter was present and cut the ribbon. Bob Horton and Patrick Gillam of British Petroleum spoke after me. But, there was an air of confusion amongst the visitors from BP. I found out later that they had received word earlier in the morning that agreement had just been reached by BP to sell Kennecott to RTZ. And here were these canned speeches being given about the long-term future of BP's commitment to the mining business and to Kennecott. Bizarre!

Swent: Oh. Oh.

Joklik: Anyway, it was a great day. It was a milestone in the long history of Bingham Canyon, and everybody felt good about it.

Swent: Oh, it must have been terribly exciting to you.

Joklik: Yes. Now, I should say we had decided we should keep part of the old concentrators working, for two reasons. One was that we had kept about 30,000 tons per day of low-cost throughput capacity at Bonneville and Magna in pretty good shape. The other was a rise in copper prices that finally began in the second half of 1987. A year later, by October 1988, the price had already exceeded a dollar a pound of copper. When you compare this with the range of 55 cents to 60 cents within which prices had bumped along for the preceding three or four years, timing of the modernization appeared almost miraculous. Let me tell you how this came about.

During 1986 and 1987, gold prices had risen after their sharp decline from the \$800 level in 1980, and gold exploration throughout the world had picked up tremendously. The stock market had picked on gold as its favorite commodity for speculative investment. We had for some time been promoting the idea of floating off a gold company. The nucleus would be the Kennecott gold discoveries that were made in the early 1980s which I'll talk about a little later.

### The Drought Breaks; Copper Prices Rise

Joklik: The underwriter of this gold float was going to be Salomon Brothers, who had Peter Ingersoll working for them at that time. Peter was justifiably regarded as the leading guru on metal price forecasting. In May, 1987, we were having a meeting in Salt Lake with Salomon Brothers to discuss the gold float. The meeting was well underway when Peter arrived from New York (I don't know if he'd flown overnight or what, but he was a bit disheveled). He pulled from his pocket a crumpled piece of paper and started talking about the strong likelihood that copper prices would pick up before the end of the year. We, the Kennecott people, found this interesting. His colleagues in Salomon, who were interested in selling the gold float, couldn't care less about copper. But Peter is a guy who, if he feels something is worth saying, will plunge right ahead. He had a strong rationale, from the supply and demand projections on his scrap of paper, that finally the crunch had come, that finally inventories had fallen below the six weeks' consumption level at which, historically, prices always reacted. It made sense to us. He then talked about the rising AIDS epidemic in Zaire and Zimbabwe as an additional factor that would drive up prices. At that stage, he almost lost his audience. His colleagues broke up and even we thought he was stretching things a bit. Of course, Peter turned out to be dead right.

The rest is history. Prices did, indeed, rise, at first from 60 cents to 70 cents. By the 15th of December 1987, copper was trading at \$1.30 a pound. Kennecott was making money at a rate of \$20 million a month. A breathtaking turnaround. Considering the completion date of the modernization project in October 1988, everybody thought we were brilliant to start this project when we did and hit a major rise in copper prices right on the nose, which added to the festive atmosphere at the concentrator opening. It also explains why continued operation of Bonneville and Magna, which came to be known as the "North Concentrator" was viewed favorably. We maintained a couple of reload areas in the pit, at which trucked ore was loaded using the few remaining railroad spurs, and hauled through one of the upper tunnels all the way to Bonneville for crushing and grinding, and then flotation at Magna, at a throughput rate of 30,000 tons a day. This operation has continued since and has been projected until the end of mine life, as an addition to the tonnage being put through the Copperton concentrator.

### Vulnerability of One-Line Ore Supply

Joklik: Before I go on to discuss the Utah Copper smelter project, I should say that the BP people in London were nervous about having one conveyor supply the feed to the Copperton Concentrator through a two-mile-long tunnel. They felt that this link in the operation was too vulnerable to be relied upon. We provided a safeguard by constructing adequate stockpile storage ahead of the concentrator. This is one of the most spectacular features of the plant--a tall gantry carrying the conveyor, a shuttle discharging onto the stockpile and three tunnels withdrawing the ore from stockpile. Incidentally, the design provided for an additional tunnel which was subsequently used for the fourth line at Copperton, which I will talk about in a minute. The fourth line was in our original design; it wasn't an afterthought. But, talking about the vulnerability of this life-line from the pit to the concentrator reminds me of Chino, where the primary crusher on the edge of the pit was connected to the coarse ore storage at the concentrator by a conveyor mounted on a trestle, a distance of about a mile. Here's what happened.

In August of 1985, Pam and I had reached a stage where we hadn't had a vacation in several years and decided we just had to have a break. We had friends in southern France and went to the Côte d'Azur at a place called San Rafael. We had been there for several days. Late one afternoon we had our friends in for a drink at this attractive apartment on the beach where we were staying. I forget what prompted me, but I called my secretary, Ruby, in the Salt Lake office. Ruby picked up the phone and said, "Guess what, the Chino coarse ore conveyor has just collapsed." And I said, "Ruby, this is not a very good joke, you know, because we are busy here having a good time. Let's talk later." She said, "Wait. I'm dead serious. It has just collapsed." So, I got the details. Apparently late the night before, the operator responsible for cleaning up around the coarse ore stockpile thought he saw the trestle sway in the moonlight. And, sure enough, in a minute the whole structure came crashing down. Very fortunately, he managed to avoid it. He sounded the alarm and went home to drink. The operation came to a halt.

That was the end of my sojourn on the pleasant beaches of France. I took a plane back and met with the boys in Phoenix, where we found a contractor who could produce the steel necessary for the repairs, in incredibly short time. With Ward Winborne, one of our most experienced and best maintenance people to ramrod the project, we had the conveyor rebuilt and up and running again in about thirty days. It was quite a feat. The cause of the collapse was rusting of some joints before welding could take

place during construction, perhaps a function of inadequate inspection.

Fortunately, parallels between Chino and the conveyor tunnel at Bingham Canyon were not well founded. To the best of my knowledge there have not been any interruptions due either to conveyor failure in the tunnel or, what was also feared, shifting of the tunnel itself due to seismic disturbance.

#### Fourth Line at Copperton Concentrator

Joklik: Our next project, the fourth line at the Copperton concentrator, was the first request for funds we presented to our new owners, RTZ.

Swent: Did they take over Kennecott?

Joklik: In April, 1989 RTZ took over BP Minerals, of which Kennecott was by far the most important component. BP had been seeking a buyer for 30 percent of BP Minerals. RTZ said no thanks, but promptly came back with an offer for 100 percent. The price paid was \$4 billion, which happened to roughly match the cost of buying back the stake in BP that the Kuwaiti government had acquired.

So, the fourth line was our first request for funds from RTZ. They have an unusual procedure, whereby operating company managers do not have contact with the RTZ board. Instead, they report to an executive in London who then takes the project to the board. Now, I reported to Bob Wilson, who later succeeded Derek Birkin as chairman of RTZ and now has that responsibility. Our presentation was made at an executive committee meeting in London in December 1989, and Bob then took it to the board. The \$227 million project was approved. Now, as I've already said, since we allowed for a fourth line in the original design of the modernization project, it shouldn't have come as a surprise to RTZ. What did surprise them was the high cost, which reflected the economic recovery underway in this country. The competition for equipment manufacture packages and for construction work at the site was not nearly as intense as it had been during the modernization project. Price escalation was universal. The fourth line included a 36-foot SAG mill with a Siemens wrap-around motor. Only a few other mills of that size had been built, several for the iron ore industry, and one for Chuquicamata, Chile. This mill had significantly larger capacity than the 34-foot SAG mills already in the first three lines at Copperton. It



was coupled with two 20-foot-diameter ball mills and, of course, with new flotation capacity in the concentrator.

Dennis Connell had succeeded Raman Rao as vice president Engineering and Construction. The project went ahead, was completed ahead of schedule and within budget and has performed admirably right from the beginning. The throughput capacity of that fourth line is 35,000 tons a day. The total milling capacity, then, was 77,000 tons a day plus at Copperton, 30,000 at the North concentrator and 35,000 for the fourth line, making a total of 142,000 tons a day. You can round that up to 150,000, with the improvements achieved since then. Kennecott's capacity to produce copper in concentrates increased to a total of 300,000 tons a year, all from Bingham Canyon.

Swent: Staggering.

#### Smelter and Refinery Modernization

Joklik: The next segment of the modernization of the Utah Copper facilities comprised the smelter and refinery. This project involved company politics. When RTZ bought Kennecott from BP, a team came over to do due diligence. We had known the RTZ organization over the years as competitors. We also knew some of their people. I'd met Sir Alistair Frame, the chairman and respected his technical and business acumen. He was a personable man. Spending time with him was a pleasure.

RTZ prided themselves on operating with a small headquarters group in London, consisting of less than 200 people. This was understandable, since most of RTZ's worldwide interests were only partly owned and had strong local management and boards, mostly with RTZ representation. In our first meeting with Alistair Frame and Derek Birkin, who later succeeded Alistair as chairman of RTZ, Birkin emphasized the "devolved" management style of RTZ. This, again, made sense because of the self-sufficient nature of the member companies of the RTZ group.

Swent: Was this greatly different from BP?

Joklik: That's a good question. To be quite honest, it wasn't really much different. BP didn't claim to run their company in a particularly decentralized manner but, in fact, did so. They just didn't make a big issue of it. There was a good deal of reporting to BP headquarters, but there wasn't much top-down direction from headquarters. With RTZ, the official policy was one of

decentralization; but, as time went on, we found this policy was not always implemented. You see, because Kennecott was RTZ's first wholly owned subsidiary, plenty of temptations arose for departing from the decentralized management philosophy.

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Joklik: RTZ's small headquarters group was thin technically. The due diligence examination of Kennecott, therefore, was fairly superficial. I had discussions both with Alistair Frame and Derek Birkin concerning the likelihood that the smelter might have to be rebuilt. Admittedly, we didn't talk in terms of the capital cost estimates which were eventually developed. Similarly, and I'm jumping ahead a little, the possible need for expansion of the tailings pond, which occupies an area of ten square miles on the south shore of the Great Salt Lake, had been documented prior to due diligence. The tailings pond had attained a height of 170 feet. We knew that, to ensure stability under conditions of seismic acceleration, it would not be wise to go higher than 200 feet. The tailings pond expansion, which is now under way, requires a capital expenditure of roughly half a billion dollars, on which there is no financial return. I doubt whether RTZ's due diligence picked up this potential liability, either.

Swent: May I ask just one question. You said their management was thin technically, but they certainly had plenty of technical expertise at their command all around the world, didn't they?

Joklik: Yes, in companies such as CRA in Australia.

As an aside, the RTZ people appreciated the cost reductions we'd been through because, compared to the oil companies, they were accustomed to operating in a more frugal manner. Both Standard Oil and BP had fleets of corporate aircraft. I have never believed that maintaining corporate aircraft was economically justifiable in the United States, where there's a commercial airline network second to none. Chartering aircraft to a remote site is sometimes necessary. But to fly corporate aircraft on standard routes between, say, Cleveland and San Francisco and New York or, as happened, I believe, to Super Bowl games, was not the way RTZ operated. We were happy to see that because, after the lean years of the 1980s, we were used to watching our pennies.

Back to the smelter project. After the purchase of Kennecott by RTZ, we began a study of options for upgrading the smelter and refinery. The study first examined the alternative of refurbishing the existing smelter and raising its throughput to somewhere near its rated capacity of a million tons a year of

concentrates. As it then was, the smelter couldn't treat more than 700,000 tons a year, because of problems with the Noranda reactors that were installed in 1973-1974 during the partial rebuilding of the smelter. The Noranda technology was recommended by Kennecott's research group, headed up by Nick Themelis, but didn't fulfill the expectation that a one-vessel operation for smelting and converting would be feasible. Furthermore, maintenance of the reactors and difficulties with maintaining the refractory linings in adequate condition, even during relatively-short campaign lives, were a constant source of worry. In all, the Noranda technology was not something Kennecott could point to with pride.

Swent: I guess it had obviously been successful in other places?

Joklik: The only place I was familiar with was Noranda's Horne smelter. They obviously had success with it. Beyond that, no one was apparently using this technology.

Swent: A costly exercise.

#### Billions-Dollar Price Tag Induces Shock

Joklik: It was. Our smelter study was finished in April of 1990. We concluded that the best solution to our smelting bottleneck would be to scrap the existing smelter and build anew, using Outokumpu flash smelting technology. The preliminary cost estimate was close to a billion dollars, which induced a mild state of shock with management. Further studies didn't come up with a better solution.

Some environmental considerations were involved. The state of Utah was implementing a new control plan for fine particulates (less than ten microns in diameter). The following year, a new SO<sub>2</sub> standard was promulgated by the state. Both of these were initiated by the EPA. We ultimately recognized that the cost of supplementing or merely refurbishing the existing smelter, to meet the emissions standards mandated by these two state implementation plans, would be prohibitive. The operating cost of the modified smelter would not differ significantly from what we were then experiencing. So, despite a large capital expenditure, there would be little return on the investment.

## Environmental and Economic Justifications

Joklik: We had to consider that the Utah Copper operations were uniquely situated, in being smack up against a burgeoning community with a population of a million people spreading in the direction of the operations. If we took any measures that would satisfy environmental standards only in the short term, we'd be shooting ourselves in the foot. We said, "If we are going to spend real money here, we'd better build something that is going to serve the operation for the rest of its life, while liberally allowing for any pollution control measures the proximity of human habitation might dictate."

The new smelter was designed to achieve the Lowest Achievable Emission Rate, known as LAER, and meet the 1991 and 1992 State Implementation Plans For Fine Particulates and Sulfur Dioxide. We decided to combine the Outokumpu flash smelting technology with the continuous converting process developed and patented by Kennecott. By means of continuous flash smelting and converting, and the use of air enriched with oxygen, we believed that the need for fossil fuels would be minimized, and concentrated SO<sub>2</sub> off-gas would be produced that could be converted to sulfuric acid with minimum emissions to the atmosphere. The design called for capture of 99.8 percent of the sulfur in the concentrates. The best we could do with the existing smelter was 93 percent. So, emissions were designed to drop from 4,700 pounds an hour to 211 pounds. Per ton of copper produced, the emissions would amount to only six pounds of SO<sub>2</sub>, which was one-third of the emissions at the Kamano smelter in Japan, then the cleanest in the world. This result could not have been achieved without elimination of the open-air ladle transfer of molten copper from the smelter to the converter, using Kennecott's continuous converting technology.

The concentrate smelting capacity would be increased to 1.1 million tons a year, which would take care of all of Kennecott's production, including the fourth line and even allowing for further expansion. The result would be a major saving of the cost of shipping concentrates for smelting elsewhere.

The new smelter would require only one-quarter of the energy previously used to produce a ton of copper. The operating costs of smelting per pound of copper would be reduced from over \$.20 a pound, to \$.10 a pound. Considering these advantages, it wasn't difficult to make a good economic case for the new smelter, to say nothing of the environmental advantages.



Swent: How organized were the environmentalists here? Did you have Sierra Club and people like that?

Joklik: Yes, but they weren't well organized. You see, during promulgation of the particulates standard, a lot of finger pointing went on in the community to identify where pollution was coming from. You had wood-burning stoves in homes. You had Geneva Steel down in Provo. They tried to make a case that the  $\text{SO}_2$  from Kennecott's smelter stack formed sulfate particulates in the atmosphere. You know, in the Salt Lake valley we do get inversions in the winter time. Studies by us and state agencies showed what we had anticipated all along, that by far the most important contributor to the particulate problem in the valley is not Kennecott or Geneva or the oil refinery here, it's automobiles. We're at the intersection of north/south I-15 and east/west I-80. It's the daily traffic on the freeways which causes particulate levels to rise.

Swent: And the population continues to grow all the time, too.

Joklik: Yes. I remember when I took over as president of Kennecott, I was interviewed by Bob Woody. I said, "Because I spent fifteen years in the mountains, in the deserts and the backwoods of the world, I am better acquainted with Mother Nature than most people are. I love nature. And, I'm the last one to willingly damage the environment." Many self-styled "environmentalists" know little about the resources of nature. They don't like to hear that to be helpful, their first step should be to curtail use of their automobiles.

Swent: Oh, yes.

Joklik: We held a press conference here in Salt Lake, where Governor Bangerter announced this \$880 million project to construct a new smelter and refurbish the electrolytic refinery. About \$80 million was earmarked for the refinery to update the tankhouse and expand the capacity, so that if the smelter is capable of producing 310,000 tons of blister copper a year from Utah concentrates, the refinery can turn out an equivalent volume of cathodes.

Swent: Did you imply that RTZ people had been surprised by this--that they had not anticipated this?

Joklik: Sir Alistair Frame wasn't surprised. I remember riding in a cab with him in New York about a year after the acquisition of Kennecott by RTZ. I said to him, "You've seen what we have and what we do. What do you think of the future?" And he said, "Frank, the first thing you're going to do is build a new

smelter." He knew. But I think the RTZ technical people had difficulty sizing up the condition of the existing smelter. For that matter, we also were surprised by the capital cost estimates of a new plant.

### Smelter Project Kick-Off Well Received

Swent: So, this project is not completed yet?

Joklik: Well, it was approved by the RTZ board on November 20, 1991. On March 11, 1992 we held the press conference at which the project was announced. It made a big splash, of course, and we were gratified to see in the newspaper the next day favorable comments from representatives of some of the environmental groups.

Swent: They could hardly complain about it.

Joklik: Well, you know, there were some who said, "Oh, Kennecott shouldn't be smelting in this state." They wanted absolute purity. And if you argued, "You want to sacrifice all those jobs, or transfer them overseas; think of the people," and you know they'd respond, "Well, that's less important." Fortunately, the project was hailed for what it is, a great environmental and socio-economic benefit. The engineering was completed early in 1993. The contractors chosen for the smelter were Davy International-Fluor Corporation, and Bechtel for the refinery. The smelting process technology was supplied by Outokumpu--

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Joklik: --the partly state-owned Finnish company--I believe they're no longer wholly state-owned--but they were after the war. They're an old-line mining company with relatively modest base metal and nickel operations in Finland. For some reason which I still don't understand, they have produced a majority of the "breakthroughs" in mineral processing, concentrating and smelting technology since the war. We had the pleasure of visiting their operations several years ago. Pam was with me on that trip. We went to their headquarters at Espo, just outside of Helsinki, and then visited the Harjavalta smelter and the research facilities at Pori. This was in May and it was still chilly, although the days were long. Maybe it's the climate that stimulates the brains of these people. They come up with solutions to problems no one else seems to be capable of. As you know, they are friendly people, staid in their ways. They like a drop to drink every now and then and have a good sense of humor. They certainly know how to get the job done.

The smelter project was completed in 1995. I'm not familiar with the cause of the publicized start-up problems that affected the operation.

#### Utah Copper, Superfund Candidate

Joklik: Let me review an episode that was closely interwoven with the smelter project. It began when several sites on Kennecott's Utah Copper property attracted the attention of the EPA, in the early 1980s. The EPA designated some of these as CERCLIS sites. CERCLIS is an EPA database for about 25,000 sites nationwide which are potential candidates for placing on the National Priority List, otherwise known as the Superfund list. These Kennecott sites were accumulations of old lead tailings and waste rock on the eastern side of the Oquirrh Range, mostly dating from before the turn of the century and having nothing to do with Kennecott's copper operations. Kennecott was never involved in the lead-silver mining operations in the Lark area that preceded the mining of copper.

There were also questions about contaminated drainage from Bingham Canyon. I thought that natural weathering alone would have produced acid drainage containing heavy metals, independently of disturbance of the ground by mining. Nevertheless, the state and the EPA attributed the contamination to Kennecott's activities. Our response was that anyone whose domestic water supply wells appeared to be contaminated should contact us. We received several requests, ran pipelines to the houses concerned and supplied them with fresh water. We agreed with the state that we would carry out a five-year study of this plume of contaminated water and devise ways and means of controlling it.

We also addressed possible remediation of the plume and found that, with the lime-rich terrain in that area, ground water preculating through the limey sediments would eventually cause dissolved metals to be precipitated out.

#### Identification of CERCLIS Sites

Joklik: The five-year study ended in 1988. By then, seven of these sites were in the CERCLIS database. In 1990, the EPA finalized a new Hazard Ranking System for placing sites on the National Priorities

List. The new system increased the chances that a site that had made the CERCLIS list would, indeed, make the Superfund list.

We had been consulting with EPA Region 8 in Denver on the new PM<sub>10</sub> regulations and other issues. Rod Davey and I met with Jim Scherer, the Region 8 EPA administrator, in November of 1990. We told him that we planned to construct a new smelter. We did so because I thought a major investment should be committed only after the environmental rules of the game had been agreed to. I worried that an arbitrary decision made at a relatively low level in the EPA could delay or halt the construction of the smelter and cause a financial debacle. I wanted the EPA to be fully informed even though, at the same time, we were still working on plans to upgrade the existing smelter. Meanwhile, we did bring the old smelter into compliance with the PM<sub>10</sub> and SO<sub>2</sub> regulations, partly through production curtailments. We knew a new smelter couldn't be finished until 1995.

Swent: But you didn't want a switch in the rules during the construction--

Joklik: We were worried about the new Hazard Ranking System. In February of 1991 we went to Denver to meet with Jim Scherer and his deputy, Jack McGraw, to assure them that we were prepared to remediate the CERCLIS sites. We argued that there was, therefore, no cause for Superfund listing.

The meeting was disappointing. We didn't receive a definitive answer. We then explained our problem to the environmental authorities here in Utah and also to Governor Bangerter. The upshot of it was that EPA listing was deferred for six months, which gave us breathing space. We went to work with a will and enlisted the aid of a capable consultant in Denver, Adrian Brown, who happened to be an Australian. We didn't hold that against him. We analyzed the sites and came up with preliminary plans for removal or remediation, as appropriate.

Swent: This was all seven sites?

Joklik: Yes. But we went further. We studied the whole of the Utah Copper property and determined what other sites were contaminated, even though they posed no threat to human health, by virtue of their remote location and the very low level of contamination. We added those to the seven that had already been identified by the EPA.



### Clean-Up of Bingham Creek

Joklik: In the summer of 1988, the EPA had identified lead and arsenic-bearing tailings in the downstream reaches of Bingham Creek, where the creek traversed residential areas. The tailings did not come from Kennecott but from lead-silver mining in the last century, possibly from the operations of the Anaconda Company and their predecessors. The EPA, with our encouragement, carried out a blood level test of kids in these residential areas and didn't find any elevated levels. But, we said to the EPA, "Look, if you're concerned about this, as we are too, why don't we jointly excavate these tailings and remove the material to a segregated site on Kennecott property, way up in the foothills of the Oquirrhs." The EPA agreed and took responsibility for going in people's back yards and digging this stuff out. We undertook to transport and place it up in the hills. We felt that ARCO, the owners of Anaconda, should have paid for this work, but had trouble collecting from them. This project improved our relationship with the EPA. They saw us in action as responsible citizens, as did the community.

However, the EPA did not arrive at an agreement with us for the voluntary clean-up of the other CERCLIS sites. They identified several more sites, making a total of nineteen locations of waste rock, tailings, smelting and refining wastes and surface and ground water contamination.

David Litvin and I went to visit the EPA people in Washington. Don Clay was the assistant administrator responsible for Superfund. His deputy was Richard Guimond. We had meetings with the White House counsel, Boyden Gray and with David Gibbons of OMB. We explained to them that we were volunteering to clean up these sites, even though we hadn't been identified as PRP's (potentially responsible parties), that our proposal would obviate the use of Superfund monies, and that the clean-up would be done more efficiently by Kennecott than by some contractor selected by EPA. We had a positive story to tell that was a win-win situation for everybody concerned--the people, the EPA and also for Kennecott, because we didn't want the stigma of being listed on Superfund. We didn't want to spend the next twenty or thirty years hassling over remediation alternatives, and we didn't want our customers to be embarrassed by buying copper from a Superfund site. These were practical business considerations.

### President Bush Listens

Joklik: About that time, President Bush happened to be in Salt Lake. I had met him before a couple of times when he was still vice president, and took the opportunity of explaining this problem to him. He listened carefully and thought we had a good case. He then spoke to the pertinent administration officials and expressed himself in favor of a voluntary clean-up agreement.

### EPA Proposes Draconian Consent Decree

Joklik: In November, 1991, we received a letter from Region 8 with a proposal for a consent decree which appeared draconian to us because of the very limited judicial recourse provided to us, and penalties we would incur if we were perceived to not be in compliance with the decree. The proposal did accord us the responsibility of identifying the contaminated sites and proposing removal and remedial actions. In other words, we would be carrying the ball, rather than the EPA.

We neared agreement in principle with the EPA, by March, 1992. The essence of the agreement was that the EPA and the Utah Department of Environmental Quality would commence a CERCLA enforcement pilot project, under which consideration of proposed listing of Kennecott sites on the NPL would be delayed, so long as Kennecott remained in full compliance with all the requirements of the consent decree. Now, a person coming in cold would look at that consent decree and say, "This is terribly one-sided." That would be true in the context of the times before the Environmental Protection Act was promulgated and before the pendulum started to swing in favor of environmental control and against industry. For many years, people thought the pendulum would swing back. But it hasn't and probably won't.

### Terrible Impression in London ##

Joklik: Before signing the agreement in principle, I went to London and sat with Bob Wilson and his staff. This wasn't the first time we had discussed the agreement. In London, the position of the EPA was regarded as pretty extreme. There were some who opposed making any voluntary agreement. But Bob saw the merit of proceeding and the executive committee decided we should go ahead.

Unfortunately, within twelve hours of that meeting, while I was still in London, a request for changes arrived from the EPA. I couldn't believe my eyes when I saw it. The EPA people said apologetically, "Oh, we had to get Justice Department approval and they want these changes." We said, "You led us to believe the agreement had already been cleared with all relevant agencies; you can't go back on it." It made a terrible impression in London, and from that day on, I never again succeeded in convincing the people over there that the EPA was acting in good faith. Our discussions became very contentious, not just with the EPA but with the people in London who were understandably upset by this *modus operandi*. I said, "You're dealing with a government agency, the EPA, and they are just as capable of bungling as any other is." But the damage had been done.

Swent: RTZ thought you should wait until you were forced to do something?

Joklik: Yes. They thought we should get listed and proceed according to the Superfund protocol. They did not understand the business implications, nor that it would cost us a lot more money, take longer and give us a bad image in the community and with our customers.

#### Agreement in Principle Signed

Joklik: Despite this worsened atmosphere, we negotiated the changes requested by the EPA and the people in London reluctantly signed off on the agreement in principle. We were then supposed to proceed with negotiation of a definitive agreement. By then, it was April of 1992 and elections in the United States were due in November. It was clearly preferable to get the agreement done under the current administration. Not that we had reason to believe that any administration would oppose it.

We announced the smelter project just before the agreement in principle was signed, although there were some who thought we should delay the announcement until we had finalized the definitive agreement. I met frequently with the EPA in Washington and Denver to direct the negotiations. As time went on, I put Bobby Cooper to work as negotiator. He had just returned from a year's secondment to RTZ's London office, prior to which I had promoted him from his initial job, as mine superintendent at our Ridgeway gold project in North Carolina. He had capable help from Lee Caldwell, our environmental counsel and Preston Chiaro, the vice president of Environmental Affairs.

What was holding up the negotiations were differences in legal interpretation between EPA counsel, our lawyers and RTZ's chief lawyer, an individual who took a negative view of the voluntary clean-up proposal from the beginning. We got into a three-cornered debate which dragged on through the second half of 1992. EPA was hailing the hoped-for outcome as a major breakthrough because the Superfund process lacked friends throughout the country. Few of the one thousand Superfund sites were proceeding to final clean-up. It was well known that public money was being wasted on litigation, so-called "transaction costs," rather than cleaning up contamination in the ground. To the EPA at least, our negotiation seemed to be one way of improving this bad image.

### Superfund Listing Forestalled

Joklik: Towards the end of the year in the waning days of the Bush administration, pressure was turned up on trying to finalize an agreement. As before, we received help from the Utah congressional delegation. Senator Orrin Hatch worked unreservedly on our behalf. Since Senator Jake Garn was not running for reelection, he was free to express points of view in his own forceful way. Even the EPA administrator, Bill Reilly, saw the merits of this case and instructed his staff to complete the negotiations by the end of the year. We came very close. But, with the change of administration, and Carol Browner coming in to replace Bill Reilly, the matter was put on hold.

Swent: The Superfund issue has not yet gone to a court?

Joklik: No. I understand our policy of unilaterally proceeding with removal and remediation at the CERCLIS sites eventually paid off, and Superfund listing no longer is a threat. Keeping Kennecott off the Superfund list probably was one of my most important contributions to the company.

Swent: Well, it was in a sense unproductive, although of course it was productive, too. But, when you think of the time and expense that goes into something like this, instead of just getting the job done.

Joklik: Yes. As you know, CERCLA was up for re-authorization. Early in 1993, I appeared before a panel of western senators, Republicans and Democrats, and related my experience with Superfund over the previous two years. They all agreed that the Superfund process had



to be drastically revised to become effective and cease wasting public funds.

Swent: Right.

#### Fruits of Cost Reduction and Modernization

Joklik: With completion of the smelter and refinery project, Kennecott's investment in the modernization of Bingham Canyon amounts to a billion and a half dollars. Seven hundred million in the mine and the concentrator and almost \$900 million in the smelter and refinery, which still leaves half a billion for the tailings pond expansion. So you're talking about a total of \$2 billion.

Swent: Real money.

Joklik: When you consider the cost reduction program without capital investment and the subsequent investment of these major amounts, it's worth reflecting where Utah Copper<sup>1</sup> stands today competitively. Back in 1980, Utah Copper was one of the highest-cost copper producers in the world. It became not only one of the lowest-cost but also one of the cleanest operations.

#### Four-Fold Increase in Productivity

Joklik: In 1980, a Utah Copper employee produced 31 tons of refined copper per year. Manpower reductions before the shutdown raised this to 47 tons. As a result of improvements implemented during shutdown, productivity increased to 59 tons per man year. With completion of the mine and concentrator modernization, we were producing 110 tons per man year. That's 3-1/2 times the productivity recorded in 1980. Completion of the smelter project has raised the improvement to fourfold. Operating costs declined correspondingly.

The U. S. copper industry, as a whole, responded to economic hardship by doing a tremendous job of "putting its house in order." Despite the relatively low ore grades relative to

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<sup>1</sup> Utah Copper is the Kennecott division which operates the Bingham Canyon mine.

overseas mines, most U.S. producers have more than held their own, in terms of international competitiveness.

### Competitiveness in Face of Future Over-Supply

Joklik: Kennecott's lean modus operandi that resulted from the tribulations of the 1980s will, I hope, remain ingrained. That's pertinent because there's much new low-cost copper production capacity coming on stream, particularly in South America. These are capital intensive operations. Once the money's been spent and they're in production, it would take a severe depression in copper prices for them to curtail production or shut down. To remain competitive in the future, Kennecott will be wise to continue the frugal habits we learned during the 1980s.

Swent: I don't know if this is a question I should ask or if you can answer it. How many years does it take to pay this investment off? Is it a rule of thumb that you try to do this in ten or fifteen years?

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Joklik: How long will it take to pay back investment in the modernization of Utah Copper? That'll depend on the balance between supply and demand. We've talked about new projects coming on stream which will add to supply. On the other hand, the outlook for copper demand also is strong, considering the rapid development of Southeast Asia, China and other regions. I should emphasize, though, our modernization projects were planned and justified using forecasts of copper prices which now appear conservative.

Copper prices since 1987 have consistently remained above Standard Oil's earlier forecast of an 80 cents a pound ceiling. The growth of copper consumption in the western world [formerly "free world"] averaged 3.3 percent annually for the period 1987-1995, compared to only 0.5 percent during the decade preceding 1987. However, the collapse of the former communist economies reduced world total consumption for the same period to 1.7 percent.

The expansion of world trade and investment following the end of the Cold War has catalysed consumption of copper, as well as the development of major new copper mines. The resulting balance between demand and supply will, no doubt, continue to undergo cyclical swings.

Resolve of Kennecott's Owners

Joklik: As I talk about investment in Utah Copper, I want to acknowledge the resolve of Kennecott's owners. Admittedly, educating and convincing three successive owners, Standard Oil, BP, and RTZ, wasn't easy. But, at the end of the day they had to rank their priorities. Funds were made available and resulted in the successful modernization of Bingham Canyon.

The Kennecott Team--Extraordinary Performance

Joklik: Although I'm telling this story, ideally it should be told by our team. When I relate decisions that were made by Kennecott to do this or request that, consensus was first reached by our management team. If one member of our senior management team could not be persuaded, we would not proceed. Our Kennecott team reminded me of the group we assembled for the Mount Newman project which consisted of ordinary individuals, each with strengths and weaknesses. They produced efforts and results that were extraordinary and unexpected. The catalyst for this exceptionally high level of performance were the challenging circumstances in which they found themselves.

Swent: This was a team that you had pretty much assembled, wasn't it?

Joklik: Yes. To single out any one person is difficult. Ivor Pickering whom I've talked about, in the early days; Del Madsen, Raman Rao and his successor, Dennis Connell, who later left Kennecott to become project manager for the El Abra project. I said to the Cyprus people that if I'd had anything to do with it, they'd never have gotten their hands on Dennis.

Swent: This is in Chile.

Joklik: Yes. Judd Cool and his successor, my trusted friend Don Babinchak were among the best professionals in the human resources business. On the legal front, Earl Tingey and Don DeBrier. In financial matters, initially John Rahilly, Bob Cereghini and, more recently, Jack Bernhisel, who was senior vice president of Law and Finance, and Tracy Stevenson. They made major contributions, not only to the copper operations but also the new projects which we have yet to talk about. Jack's an outstanding businessman, and, as with all these people, a good friend. Rod Davey, out at Utah Copper, was an extremely capable manager; as were Ken Vance, Dave Kinneberg, Bob Dimock, Burgess Winter, and Harold Kruger. Bill

Melville and Dave Thomas did a great job of sales. Tom Patton, Russ Babcock and Gerry van Voorhis successfully led the explorationists.

Last, but by no means least, Ruby Danielsen was my fast, feisty and faithful secretary for all the thirteen years of my presidency. I owe her my eternal gratitude for sticking with me through thick and thin.

This was a case of a band of happy warriors winning a whole bunch of battles and, ultimately, winning the war.

Swent: And you carried the baton, and you were the captain--

Joklik: Well--

Swent: As I sit here, I'm looking at this bronze of Rodin's Thinker, inscribed Copper Man of the Year. What year was it?

Joklik: 1988. I said at the time, I was accepting it on behalf of the Kennecott team. And my Kennecott colleagues surprised me by presenting me with a beautiful cast of a bald eagle because they felt this personified the leadership I had tried to give them.

Swent: Are we "deep enough" for now?

### The Third Goal--Discovery of Opportunities for Investment

[Interview 6: February 22, 1994] ##

Joklik: Well, to round out this discussion of Kennecott, we should talk about the fruits of exploration and development since I took over in Salt Lake. This was the third element of the strategy we evolved in 1980. The other two were first, cost reduction without major capital investment and second, modernization of the mine, concentrator, smelter and refinery.

### Justification for Exploration and Development

Joklik: What drives exploration and development in a mining company is awareness that resources are being depleted and will run out one day. To perpetuate a viable enterprise it's necessary to discover and bring into production new ore deposits. It's my nature to



look to the future. It's not something I have to force myself to do. I'm always concerned about the opportunities and problems of tomorrow.

Swent: Of course as an exploration geologist, this is your field.

Joklik: Yes. You know, management fads come and go. Diversification tends to alternate with attention to core businesses.

Utah Copper now has the potential of uninterrupted operations until the ore reserves in the Bingham Canyon mine are exhausted; that will be in about thirty years' time. Modernization of the production facilities and the cost reductions of the early 1980s have ensured that the company will survive down-turns in copper prices. The cash costs of production are in the range of thirty to forty cents a pound. It would take an unprecedented price collapse to endanger the operation. I don't see that happening, despite the fact that there's much low-cost new capacity coming on stream. So, I believe Bingham Canyon will continue to operate profitably, but the time will come when the ore reserves are exhausted, and the question is, what then? Now, if it's just a matter of dividending out profits to the shareholders and then closing up shop--that's certainly one scenario which would be a happy ending to the story. On the other hand, if the company's expertise has, meanwhile, been applied to acquiring or discovering and bringing into production other mineral deposits, then the company will continue in business. I've always regarded exploration as a cost of doing business. There are companies that concentrate on mining out their ore deposits and don't give much thought to the future. In my opinion, a proportion of earnings applied to exploration is worthwhile, through good times and bad.

Kennecott went through several futile attempts to diversify, such as with Okonite and Peabody. Carborundum didn't work out. There was an effort to get into oil and gas and another into South African gold. None of these was successful.

Swent: Of course, there were South American adventures, also.

Joklik: You mean El Teniente?

Swent: Yes.

Joklik: Well, before El Teniente was divested, the investment had been returned several times over. And it wasn't really a diversification from porphyry copper mining.

Anyway, Kennecott persevered with exploration during the difficult years of the late 1970s and the 1980s. Changes of ownership influenced the level of expenditure. Standard Oil bought Kennecott in 1981 and increasingly viewed exploration as unjustifiable. But we didn't give up. Then, in 1987, BP bought the portion of Standard Oil they didn't already own. Finally came the acquisition of BP's minerals business by RTZ, in 1989. RTZ, being a mining company, supported a reasonable level of expenditure on exploration.

Swent: I would think that the oil companies would be very exploration minded.

Joklik: They were. Exploration for oil and gas.

Swent: But not for minerals.

Joklik: We're talking about a period when Standard Oil cranked up their domestic exploration from virtually zero to a rate of a billion dollars a year. That's what happened in the early 1980s, largely driven by Tom Barrow. Then you had the failure of exploration in Alaska, the disastrous Mukluk Well.

Swent: That must have been a terrible disappointment.

Joklik: Yes. After Mukluk, the rate of expenditures on oil and gas decreased. But until then, money for minerals exploration was hard to come by. That constraint continued throughout our ownership by Standard Oil.

#### Meager Results from Past Efforts

Joklik: When I was appointed president of Kennecott, the company had developed expertise in exploration for porphyry copper deposits, second to none. But the fruits of that program were meager. Much porphyry copper mineralization was found, but not with grades and mining characteristics that would allow economic exploitation. One of the largest such deposits was at Safford, Arizona. It had been tested as an in situ mining project. In situ technology comprised injecting lixiviants into a deposit through bore holes, drawing the copper-enriched solutions through recovery wells, and precipitating and refining the dissolved copper with solvent extraction and electrowinning.

Swent: This was a very exciting and new possibility, wasn't it?

Joklik: Yes. It was partly kibitzed from oil companies. Petroleum reservoir engineering was applied to devising in situ mining technology. Kennecott had spent \$20 to \$25 million at Safford.

Swent: It was to be safer, cleaner and the answer to many problems.

Joklik: Right. There were great expectations. But, when I first looked at it, there seemed to be a world of difference between the relatively undisturbed geological environment of an oil reservoir and the environment of porphyry copper deposits, including the tectonic effects of intrusion and diastrophism. I said "Why should lixiviants saturate a porphyry copper orebody and dissolve a substantial proportion of the copper mineralization? Why shouldn't those lixiviants follow the easiest path, and be picked up in the recovery wells, without having contacted any appreciable copper mineralization?" When we began to critically address this question and conduct controlled experiments with injection and recovery, my concerns were borne out. The project was abandoned.

Another project Kennecott had put a lot of money into during my Amax years was ocean nodule mining. Millions had gone into developing systems for gathering, transporting and processing this material. As I said previously, what halted the project were the Law of the Sea restrictions.

By 1980, these projects were behind us. And so was Kennecott's traditional exploration philosophy: "You can look for anything, as long as it's copper." I believed there shouldn't be any bar to what commodity you explored for. Commodity price forecasts couldn't be relied on. As long as you found large, high-grade, low-cost resources of any commodity, you usually came out a winner.

Swent: I read a very important presentation you made about this philosophy. Did you also have to "sell it" to the board--upwards as well as downward?

Joklik: Oh, yes. Another element of my exploration philosophy is that you can't force Mother Nature into pre-conceived parameters. By all means, you can learn from one occurrence and apply those ideas elsewhere; but I've seen promising exploration projects abandoned because they didn't exactly fit someone's rigid preconception. And then someone else comes along and, with a little more flexibility, drills into an orebody.

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Swent: But were there, in your experience, any properties that people abandoned and later were--

Joklik: Well, sure. In the case of the Crixas gold deposit, which I'll discuss later, the geological model used by the owners turned out to be wrong.

### Exploration for Precious Metals

Joklik: Precious metals at first played well with our owners, the oil companies. Not that we began the search for precious metals only then. With the decline in base metal prices, particularly copper, and the strengthening of precious metal prices in 1980-1981, we switched a substantial proportion of our exploration program to precious metals. The outcome of that strategy was the discovery of five orebodies. Three were developed into mines, one was sold, and Lihir, which I'll describe, is being developed.

I'd like to talk first about those five precious metal discoveries, then I'll discuss two properties we inherited from BP and developed into mines, and finally I'll relate diversifications into three commodities other than precious and base metals, namely uranium, coal and diamonds.

Swent: So that's a total of ten.

### Alacran Silver, Jalisco; Perseverance Pays

Joklik: First I want to talk about the discovery of the Alacran silver vein in the Bolaños mining district. Alacran means scorpion. It's in the state of Jalisco, about eighty miles north of Guadalajara. We began prospecting in Mexico in 1978. You see, at that time, few foreign mining companies were active in Mexico because of unsatisfactory experiences in the past and a requirement for 51 percent Mexican ownership. But the geology was attractive.

Swent: There was considerable terrorism at that time.

Joklik: Yes. In this old mining district of Bolaños, the Spaniards had operated since the early 18th century. They used forced Indian labor to extract high-grade ore, which ran 200 ounces to the ton. They took it by mule train 400 miles to the Atlantic coast and shipped it to Spain for recovery of silver.

Swent: This was gold and silver?



Joklik: No. This was a silver mining district.

The town of Bolaños served as a provincial capital. The governor's mansion, which dated from the 17th century, was used as headquarters of a small company owned by the Davila family, with whom we concluded an agreement in 1979. The walls were eighteen inches thick, and the doorways were beautifully fluted. The countryside consisted of sere, rugged terrain. The people living in these little towns, connected only by foot trails, eked out a living by growing whatever crops they could--mostly beans and corn--on steep, rocky hillsides.

Swent: How did you get into Bolaños? Is there a railroad or train, a highway?

Joklik: No. They had an air strip which was about the width of a country road, about twenty feet wide. There was a stone wall at one end. On one occasion, when I wasn't in the plane, the pilot hit the stone wall, and sheared off the landing gear. Landings usually were interesting because of the hot, turbulent air conditions.

Swent: What kind of plane--?

Joklik: Oh, just single-engine Pipers and Cessnas.

Swent: From Guadalajara?

Joklik: Yes. It's about an hour's flight. One day, we were bumping along the rough road from the airstrip to the mine and encountered a peasant wearing a huge sombrero. He was leading a donkey. His wife and a child were on the donkey. For a second, it called to mind the Flight into Egypt.

Swent: How did you find this property? Did your geologist find it, or was it brought to you?

Joklik: Our geologist found it. We had targeted the Bolaños field for exploration. After the Spaniards, the Cornish had mined there; and early this century, an American company worked the silver veins. The ore left was not of bonanza grade. It ran from five to ten ounces to the ton. Our acquisition of a 49 percent interest in the property was based on the premise that we would expand the existing concentrator from five hundred to a thousand tons a day and feed it with this relatively low-grade mineralization. Now, our agreement with the Davilas was made in 1979, when the price of silver was \$20 an ounce. The price then declined to \$4 an ounce, and we began losing money. Also, we'd sunk capital into the expansion of the concentrator. We'd hired as manager a young man named Alfredo Parra, a graduate of one of

Mexico's excellent mining schools. He was an outstanding mining engineer and managed a competent work force.

Swent: You said the price fell from \$20 to \$4.

Joklik: Yes. We'd financed the mill expansion and now had to borrow from the banks to cover the operating losses.

Swent: And you had only 49 percent.

Joklik: We had 49 percent, but 11 percent was put into escrow to give us effective management control. Before long, the Standard Oil people in Cleveland were noticing this money-losing operation. I was visiting Bolaños once a month to help find solutions to our problems. I insisted that exploration for some vein the Spaniards might have missed should continue. Well, in October of 1983, by which time we were about \$30 million in debt, we discovered the Alacran vein. A drill hole intersected four meters running seventy ounces to the ton. You can imagine our relief! We laid out a crash program of sixteen holes drilled from the surface--all deep holes, in difficult ground conditions. On the basis of the ore outlined by this drilling, we designed an adit, one mile long, to undercut the projected base of the orebody. To speed up the adit, we brought in a boring contractor from Cleveland. Drifting would have taken three or four times as long.

Swent: This is through volcanic rock.

Joklik: Yes. The adit hit the vein structure as planned. But, all we found was quartz and altered minerals running only two or three ounces of silver. We puckered up and said, "Maybe all is not lost. We'll raise from the adit and see whether ore is within reach." We had to raise only a few meters and ran smack into the keel of high-grade mineralization.

Swent: Party time.

Joklik: I'll say. Our relationship with the Davilas--there were four brothers--had been good; but the brothers didn't hit it off that well with Alfredo Parra. Unfortunately, he left. I had high regard for him. He was replaced by Juan Holguin, who was then sixty-eight years old, an extremely skilled mining engineer and manager who had spent most of his career with IMMSA. Holguin took over from Parra in a smooth transition. I remember visiting Bolaños in January of 1986. Production was humming along at 1,000 tons a day. Ore grade was running better than twenty ounces a ton, and cash was pouring out to us at a rate of \$1 million a month. And it improved from there.

The story had a relatively happy ending because we paid back our indebtedness in only eighteen months after we began mining high grade ore. Whereas we had gotten along well with the Davilas during the lean years, disagreement arose about how to treat Mexican tax liabilities. We decided the best thing would be to sell out, which we did. The operation was bought by a subsidiary of Cyprus Minerals. I later heard that they had misunderstandings with the Davilas.

As for us, we had an exciting and financially rewarding experience in Mexico. People have asked me at times what was it like doing business there. Well, the Mexican management team was top notch. The work force was productive. And to the best of my knowledge, during our ten years of operation, there was not one penny paid by way of a bribe.

Swent: Sounds as if you had some brilliant geologists.

Joklik: Yes. The discovery of Alacran resulted from detailed surface mapping and geochemistry. It turned out to be the richest vein in the field and the Spaniards missed it.

#### Crixas Gold; Geological Acumen

Joklik: The second discovery I would like to talk about is Crixas which is in Goiania, about eighty miles from Goias and 260 kilometers northwest of Brasilia.

In July of 1981, I went on a trip to Rio to look at the Pocos de Caldos aluminum plant and smelter of Alcoa-Brazil. We were seriously thinking of getting into the bauxite and alumina business and had been invited by Hanna to look at buying their interest in Alcoa-Brazil. I visited Brasilia and met with Minister Cals, the minister for mines. I spoke to him in a mixture of Latin and French, and he responded slowly in Portuguese. Believe it or not, we were able to dismiss the interpreter and converse for a couple of hours, with the aid of a lot of gesticulating and joking.

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Joklik: He told me to look for precious metal prospects, and pointed out that the greenstone belts of the shield areas had been only superficially prospected.

Swent: There was a boom going on in northern Brazil at that time, wasn't there? Gold?

Joklik: Not yet. What attracted a lot of attention was that great alluvial mining location up north, called Serra Pelada.

A marvelous documentary film was made about the 30,000 garimpeiros working this deposit. It has since been pretty much mined out.

Swent: That was a completely separate thing.

Joklik: Yes. But, what this visit encouraged me to do was to send a team down to Brazil, including Don Bullmer, one of the senior people from our Tucson office. He was an accomplished stratigraphic and structural geologist. He looked at this Crixas prospect which had only been scratched at the surface by garimpeiros. The rights to the sub-surface mineralization were held by International Nickel Co. The gold occurred in several chert horizons, but the Inco geologists had not yet recognized this stratigraphic control. They estimated the ore reserves to be only half a million tons with a grade of seven or eight grams to the ton. Well, Don said, "No. This could be a lot more extensive. The mineralization seems to be dipping in a direction opposite to what the Inco people are thinking." On the basis of Don's analysis, which was supported by Gerry Van Voorhis, our vice president of exploration, we concluded a joint venture with Inco, whereby we could earn a 50 percent interest in the prospect.

Well, we commenced drilling and found three horizons containing excellent grade gold mineralization. We outlined a possible ore reserve of ten million tons running fourteen grams to the ton, which is half an ounce.

Swent: And there were no barriers to investment there from the Brazilians?

Joklik: No. But I've just given you the good news. The not-so-good news was that the Standard Oil people were talking about cutting off our exploration funds. Frank Mosier, to whom I've referred before in connection with Bingham Canyon, was saying that if a prospect like Crixas was worth anything, we should prove it by selling it. A peculiar train of thought. So, we did start to make inquiries about possible purchasers. The most obvious would have been British Petroleum which owned a majority interest in Standard Oil and was exploring in Brazil. They said, "Well, yes, we'll send a team to look at this, but we're kind of busy right now." Meanwhile, I had telephoned Peter Gush who was running Anglo American's gold and uranium operations in South Africa. He called



their people in Brazil. Their operations in Brazil were run by a blue-eyed Portuguese who was quite a character. His name was Mario Ferreira. Mario wasn't slow to send a team to Crixas. When they arrived, they told our people, "Oh, the phone call from South Africa said you had fourteen-gram material here. Of course, we realize this must be a mistake. It must be 1.4 grams." Our guys said, "No, no, it is fourteen grams." And these people nearly flipped.

To make a long story short, in May of 1986 we sold our interest in Crixas to Anglo-American for \$30 million. We'd spent maybe a couple of million dollars. It was a nice profit. BP eventually did submit a bid, but it was too little too late and the property went to Anglo-American. They've developed it since then into a highly efficient, low-cost gold producer. The mine turned out 126,000 ounces in 1994.

Swent: You sound disappointed that you didn't have the fun of doing it yourself.

Joklik: Oh, it would have been great.

#### Rawhide Gold, Nevada; a Pyrrhic Victory

Joklik: That's two down. The third one I'd like to talk about is Rawhide, Nevada. We're getting closer to home now. Rawhide is an old mining district, 120 miles southeast of Reno. The mineralization is associated with Tertiary volcanics. We acquired the property from the Denham family and drilled out a large, low-grade ore reserve. Under pressure from our oil company owners to conserve funds, we brought in Kiewit Construction Company who financed the project in return for a 49 percent interest. Now, just to backtrack a minute, Mosier had previously wanted us to sell our interest in the property, same as Crixas. But just before making a presentation to the Standard Oil board, I ran into Bob Horton. He said, "You'd be nuts to sell that," and backed me up during the presentation. Instead of selling, we implemented the development joint venture with Kiewit. In some respects, it was a Pyrrhic victory for me, because Frank Mosier was not happy with this turn of events and let me know about it. But, we saved the project. This gold mine came on stream in 1990.

### Barney's Canyon Gold, Utah; A Money Spinner

Joklik: The fourth precious metal discovery I should talk about is Barney's Canyon, which is five miles north of Bingham Canyon. This mine was the fruit of a program of detailed exploration of the Oquirrh range, in which Bingham Canyon also is situated. We turned up a weak geochemical anomaly in 1985. At first, we couldn't do anything about it because we were in the midst of acquiring land for the new Copperton concentrator.

Swent: So why did that prevent you from doing anything about it?

Joklik: Because we didn't want to bid up land values at a time when we still had a lot of property to acquire for the concentrator. We then went about delineating an ore reserve of 13 million tons running .06 oz. a ton, in an altered dolomite formation. The mineralization occurs in two discrete pods, about a mile apart. The design of the mining and gold recovery operation was relatively simple because of the uncomplicated metallurgy. The ore is crushed, screened and conveyed to leach pads, from which the pregnant gold-bearing solutions are collected. The gold is recovered by carbon adsorption in a simple, compact plant.

The mine came on stream in the third quarter of 1989 and has produced in excess of 100,000 ounces a year of gold, at a cash cost of about \$150 an ounce. It's been a real money spinner.

Swent: No connection with Bingham Canyon.

Joklik: Perhaps twenty miles down, but nothing that's visible on the surface.

The fifth precious metal property we found is Lihir. Do you want to get into that now, or do you want to--

Swent: Let's look at Lihir.

### Lihir Gold, Papua New Guinea

Joklik: I mentioned before that, when I was working for Amax, in 1966, we looked at porphyry copper prospects on Gazelle Peninsula, the northeastern portion of the island of New Britain. I did this in company with Jack Thompson, from the Bureau of Mineral Resources in Canberra, whom I later hired for Amax, and with Peter McNabb, who then was with the Geological Survey of Papua New Guinea.

Swent: It's a really terrible place, isn't it?

Joklik: It's rain forest, steep terrain, infested with leeches.

Swent: And the people aren't very friendly always.

Joklik: Well, we didn't have any difficulty. This is Tolai country. The Tolais were known to be warlike. They did all they could to help gain independence for their nation. There were acts of violence.

Well, this was how I got to know Peter McNabb. Later, when I reviewed Kennecott's exploration program in 1980, we had an office in Sydney headed up by a young geologist named Mike Turbott. I encouraged Mike to take a look at Papua New Guinea, because of my recollections that the geology was favorable not only for porphyry copper deposits but also for volcanic-hosted gold.

#### Joint Venture with Niugini Mining

Joklik: Well, as it turned out, Peter had already linked up with Geoff Loudon, an ex-Placer Mining geologist who had started a small exploration company called Niugini Mining. So, we formed a joint venture with Niugini Mining in 1981, principally with the idea of utilizing Peter's experience.

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Joklik: Peter had identified several prospective areas, mostly in the northern part of Papua New Guinea and on some of the off-shore islands. But, a moratorium on prospecting inhibited him from following up. This was a consequence of Papua New Guinea becoming an independent country in 1975. The new government was figuring out the best approach to development of their mineral resources.

Swent: A lot of people were flocking in there at that time, weren't they? Prospecting?

Joklik: I don't know. There wasn't much prospecting activity. When the moratorium was lifted in 1982--

Swent: 1983.

Joklik: You're right. Our applications for prospecting areas were submitted just prior to lifting of the moratorium in 1983. High on our list was Lihir Island, where Peter had landed and sampled a

mineralized outcrop which proved to be gold bearing. Amazingly, Lihir is on strike with Bougainville Island, on which CRA had for fifteen years been operating one of the world's great copper and gold mines, at Panguna. They carried out geochemical prospecting on the surrounding islands and evidently didn't detect gold mineralization on Lihir Island. That's an example of what we were talking about before. Maybe they had the wrong geological model in mind.

### South Seas Hospitality

Joklik: In November of 1983, I paid my first visit to Lihir Island. We had drilled several shallow holes. Gavin Thomas, our man in charge, had established a camp close to shore. We flew in by helicopter after taking off from Rabaul late in the afternoon. The flying time was about an hour. About halfway across the water from Rabaul to Lihir island, a distance of about sixty miles, darkness set in. It was an eerie feeling, considering we were out over the Pacific Ocean, and Lihir Island is only ten miles across. Fortunately, Gavin and his people lit a fire which we couldn't have missed, even if we'd been a bit off course. We landed by its light. A bamboo shelter had been erected by the shore, and some of the National ladies had prepared lobster. These critters were huge. There was plenty of beer. The man in charge, named Paul Volcan, came and asked whether we would permit entertainment by their women folk, with singing and dancing. Along came about forty ladies, ranging in age from twelve to seventy years. And they danced while singing harmonious island songs.

This went on for about an hour. We were about ready to leave when Paul said, "The ladies enjoyed this performance and would like to do it over again."

Swent: Oh, my.

Joklik: We feared offending them and said, "Yes." As we were standing there--

Swent: You had to stand the whole time?

Joklik: Yes, but it was a magical atmosphere. The coconut palms cast shadows in the torch light, and you could hear the gentle surf on the beach. You could imagine Captain Cook or some other early explorer, being feted.

Swent: What were they wearing?



Joklik: Dresses.

Swent: Muumuu kind of things?

Joklik: Yes, you could say that. On Lihir Island, there was a Catholic mission, the Pali mission which not only preached Christianity, but also ran courses in basic skills such as carpentry, welding and pipefitting, and had been doing so for decades. It was established by German missionaries when New Guinea was a German colony before the First World War. Most of them spoke English and a few spoke German.

The island measures about ten miles by fifteen and consists of five extinct volcanos that rise steeply to fifteen hundred feet above sea level. The gold mineralization is on the southeastern side of the island in a caldera, the walls of which form a semi-circle breached by the sea.

Swent: So the other half of the caldera has been--

Joklik: Is beneath sea level. But you get deep water close in to shore.

Swent: Right.

Joklik: This partly eroded volcano forms Luise Harbor. You couldn't imagine an orebody in a more favorable location than right on deep water. Only, it's isolated. There's no infrastructure.

#### Primary Mineralization Refractory

Joklik: Anyway, at the time of my first visit, we had drilled several holes in the mineralization McNabb and his companion found when they landed there by boat. Those few drill holes indicated that the oxidized mineralization was likely to be of limited extent, perhaps only several million tons. We discussed the potential and concluded that we should be looking for primary, unoxidized mineralization. A geochemical survey and detailed mapping were followed by more drilling. Primary mineralization turned out to be very extensive. In this area where the original discovery was made, we outlined the Lienetz deposit. From 1983 to 1985, we proved up well over one hundred million tons of primary mineralization.

The economics of this deposit didn't look particularly robust, for several reasons. The cost of developing a mine and building processing facilities would at least double by the time

you'd put in a port, roads, power, water supply and housing. The primary mineralization consisted of gold encapsulated in pyrite. We found that the gold could not be extracted by cyanidation at normal temperature and pressure. We did preliminary metallurgical test work and found several possibilities for extracting the gold, but these were all capital intensive. The most obvious process would be crushing, grinding and flotation, to produce a gold-bearing pyrite concentrate which would then be roasted and leached to extract the gold. But, tests showed that you'd lose 10 percent of the gold in preparing the concentrate. Recoveries from roast-leach tests were poor. And, you'd have to build an acid plant to capture sulfur dioxide.

Swent: Where were you doing all this testing?

Joklik: In Australia and Canada.

We finally concluded that we'd have to use pressure oxidation in autoclaves to extract the gold. Preliminary tests gave good results. There wasn't much in the way of precedents for applying pressure oxidation to raw ore--

Swent: South Africa pioneered it, didn't they?

Joklik: The one we were most familiar with was Homestake's McLaughlin mine in California.

Swent: 1985 was when they came on stream.

Joklik: Yes. They were about the first ones to treat raw ore. The others were using concentrates. Gencor in South Africa and Sao Bento in Brazil were the other operations we could go to for reference.

Swent: Yes.

Joklik: Another problem was that the Luise volcano is only 10,000 years old.

Swent: It might blow up again.

#### Shoe-Full of Hot Water

Joklik: Well, I hope not, but it's associated with an active geothermal system. Sulfur springs are only a short distance from where the first discovery was made. I remember landing there by helicopter. As I got out, my shoe broke through the crust of sulfur-rich

material and filled with hot water, much to my companions' amusement. Our drill holes intersected super-heated water which would require mitigation by drilling perimeter wells to divert the geothermal fluids before they reached the mining area.

These technical and logistic problems took a lot of imaginative engineering back here in Salt Lake City.

Swent: And 1985 was when you were having tremendous problems right here.

Joklik: Yes. But we managed to keep exploration separate. In 1985 we discovered the Minifie deposit. The discovery was three-quarters of a mile south of the Lienitz deposit. Drilling since then has shown that the two are continuous. Minifie had the advantage of being higher grade. It ran better than a tenth of an ounce and needed less stripping than Lienetz.

#### Communicating with PNG Government

Joklik: This discovery improved the overall project economics. But, we were having problems with the Papua New Guinea [PNG] government. Some of these problems were unintentionally caused by our partner, Niugini Mining, who had a 12 percent carried interest in the project. They were a public company, and every quarter they would publish the drill intercepts we'd obtained. Now, if you read in the press that 200, 300, or 400 feet of material averaging close to a tenth of an ounce had been intersected, you'd be encouraged. Especially if you didn't yet know that this was refractory material which was going to be costly to treat. With time, the officials with whom we were dealing in government concluded that we were outlining a bonanza whose development could begin right away. This resulted in an ongoing struggle to convince them of the true state of affairs, namely, that this was a major gold resource, but certainly not a bonanza.

At the same time, the development of Porgera was progressing. Porgera, owned by a consortium of Mt. Isa Mines, Consolidated Goldfields and Renison Mines, had long been regarded as a large, low-grade, disseminated gold deposit. It was only in the early 1980s that they found an associated high-grade resource of about five million tons grading better than an ounce to the ton. This drastically altered the economics of the project and made it difficult for us to explain to the PNG government that we did not have a sweetener of that kind at Lihir. Later, when Porgera came on stream in 1990 and they repaid the project debt in

the first eighteen months of operation, the government became even more skeptical when we kept pleading poor economics.

Swent: Porgera was also in Papua New Guinea?

Joklik: Yes. It's on the main island, in the highlands.

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Joklik: The Ok Tedi project also affected our credibility. This is a porphyry copper project, not far from the border between Papua New Guinea and West Irian. The orebody was discovered by Kennecott during my Amax years. Kennecott proved up ore reserves, but found it impossible to negotiate a satisfactory agreement with the PNG government. When I say satisfactory, I mean an agreement that would give Kennecott a decent return on its projected investment. Kennecott didn't proceed with Ok Tedi. The mine was subsequently developed by a consortium which included BHP, Preussag and Amoco. The project had a checkered history which I don't want to go into now. But walking away from Ok Tedi gave Kennecott a poor image with the PNG government, which they referred to in our negotiations concerning Lihir. In other words, they wondered whether we were sand-bagging a bonanza. Actually, we were working our tails off on exploration and engineering problems of a marginal project, and spending large amounts of money doing so.

Swent: There was also extra pressure to be environmentally careful because of Ok Tedi?

Joklik: No, I don't think so. We approached Lihir in an environmentally responsible way from the start. None of us had worked on Ok Tedi. The implications of that project, as perceived by the PNG government, were of a financial nature, rather than technical or environmental.

The PNG government is headquartered in Port Moresby. Seven hundred languages are spoken in the country. Land ownership is the measure of a man's or a woman's worth. They understand individual ownership, rather than a communal or nomadic tradition. What we call "free enterprise" is something they have no difficulty grasping. Individual ownership makes it difficult for a company to obtain land needed to develop a mine, and build processing facilities and infrastructure. Negotiation of such matters, in a culture that hasn't changed much in hundreds of years, is not done overnight. The worst thing one can do is put pressure on their negotiators to observe time limits. They then become suspicious and wonder if they'll get the short end of the stick.



The government in Port Moresby included Sir Michael Somare, the first prime minister of the independent nation, and Sir Julius Chan who is now prime minister. In negotiating a Special Mining Lease, which would spell out the conditions for development, I encountered reasonable attitudes, provided we took time to explain our intentions in as much detail as was wanted.

Many Australian expatriates were still in the administration in Port Moresby. During the ten years of my experience there, the number of capable expatriate officials dwindled rapidly. The objective was and should be, to staff responsible positions with nationals. For an expatriate, there's no such thing as building a career there.

### Optimizing Economics

Joklik: The changes of ownership of Kennecott also had to be dealt with. By the late 1980s, we had spent close to a hundred million dollars on exploration and engineering at Lihir. Our stride was broken temporarily in 1988, when the idea of floating a gold company was pursued, and I'll talk about that separately. By the end of the decade, the mineral resource had been drilled out and shown to contain thirty to forty million ounces of gold. The question was, "How much of this could be profitably extracted?" We had differences of opinion with RTZ's people in London on that score. Some of us leaned towards a project with a high mining and throughput rate, to gain economies of scale. The initial investment could be kept within limits by taking in partners, provided project economics were optimized. RTZ people preferred a lower throughput rate, selectively mining high-grade material and stockpiling low-grade material for possible future processing.

Swent: How did you feel about this?

Joklik: Based on my experience at Mount Newman and other projects, I believe you should develop a mine so as to achieve the best return on investment, taking into account the size and grade of the orebody, the metallurgical characteristics, location, manpower availability, infrastructure requirements, markets, etc.

Swent: You have to make some decisions.

Joklik: Yes, but numbers speak for themselves. It's essential to be extremely careful about the basic assumptions made in designing a project. The most serious mistakes I've seen have occurred when the basic assumptions are assembled with haste and an engineering

contractor is set to work. He starts generating drawings, in order to fill office space with as many people as he has idle, and produces designs that don't necessarily yield the best returns from the project. But, if you take the time to formulate the tough questions and answer them before engineering contractors get to work in earnest, then you've got a chance of coming up with a good project.

Swent: What are these questions? How long do you want the project to last?

Joklik: No. That drops out at the end. The first task is to define your ore reserves. Second is to get the metallurgy straight. Third is to determine your infrastructure requirements. Then comes a preliminary mine plan, a conceptual project design and an order of magnitude estimate of the initial costs.

Swent: That's where your judgment comes in.

Joklik: Yes. Then, an honest look at operating costs, with a contingency built in. If you don't go through these steps, you're going to finish up with something that may not work.

Swent: You did a huge feasibility study--

Joklik: We did several feasibility studies over the years. As our knowledge of the gold resource and its environment broadened, we'd recognize new problems and opportunities that needed to be evaluated.

Swent: A long time, though.

Joklik: But not unusual for large projects in remote locations. If anything, ten years is on the short side, starting from discovery. And this was a virgin discovery.

My last visit to Lihir was in September of 1992. That was the first time I'd taken Pam to see the project. Our team had a series of meetings with government officials. Plais Wingti was still prime minister and Sir Julius Chan was deputy prime minister. The stage seemed set for the project to proceed.

Swent: I must be mistaken. I thought there had been, maybe not at Lihir, but in parts of Papua New Guinea, real dangers of personnel being murdered by the--

Joklik: Oh, yes, that's the Bougainville Island copper mine which was shut down because of an armed rebellion. There were other difficulties at Mount Kare. And, not long ago, there was violence at Porgera.

Well, what can I say? It's a beautiful country. It's a wild country. Malaria is rampant. The people--the nationals--lead a hard life. Some are more warlike than others.

Swent: Nobody at Lihir has been attacked?

Joklik: No. There are 4,000 people on Lihir Island. Our relations with them have been good. Now, it was necessary to negotiate an agreement with them for the use of their land. A few people had to be relocated. When Porgera went ahead, the government made project participation available to the Engans, who inhabit that province. The Porgera agreement, I believe, has been subject to re-negotiation. Similarly, an agreement had to be worked out for Lihir, taking into account the desires of the national government in Port Moresby, the provincial government headquartered in Kavieng on New Ireland, and the Lihir people themselves. In the end, they're the ones the project will impact. They're the ones who have to put up with being propelled from their traditional idyllic existence into the turmoil of a huge industrial development.

Swent: A real challenge.

### Twelve Years of Progress

Joklik: Yes. I spent a good part of my last twelve years with Kennecott championing the Lihir project. Although the project was never favored by Kennecott's owners, we kept resuscitating it, in the conviction that ultimately this great resource would be successfully developed, which now at last appears to be the case.

Swent: But there must have been reverberations, with all the ownership changes that were going on.

Joklik: Oh, that was time consuming.

### Inheritance From BP

Joklik: We inherited two projects when we became a part of BP. That was in 1987 when BP took over the part of Standard Oil they didn't already own.

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Joklik: Kennecott then became BP Minerals America. We weren't too fond of that name and didn't think it was going to last. As you know, when RTZ ultimately bought BP's minerals business, the first thing they did was restore the Kennecott name because they recognized its value.

#### Ridgeway Gold, South Carolina; Slate Belt

Joklik: Anyway, BP brought us two properties. One was Ridgeway.

Swent: Where was BP headquarters?

Joklik: BP's North American minerals division was based in Denver. Kennecott absorbed this division and employed most of their people.

Ridgeway is fifteen miles north of Columbia, South Carolina. It's a gold occurrence in the Carolina Slate Belt. Did you know that South Carolina was the premier gold producing state in the union prior to the California Gold Rush?

Gold was discovered at Ridgeway by a local prospector named John Chapman. I think the initial drilling was done by the State Geological Survey, before BP acquired the prospect.

BP drilled out a large, low-grade resource in two deposits aggregating about 56 million tons grading .03 ounce of gold per ton. In many respects, Ridgeway is similar to Misima in Papua New Guinea. It's a comparable kind of deposit and operation.

When Kennecott acquired Ridgeway from BP, mine development had been disrupted by an environmental group. With help from the state government, we resumed development in 1988. It's an open pit operation. The ore is crushed, ground and agitated in reactor tanks. The gold is recovered by Merrill Crowe technology because of the silver content.

Swent: The price of gold has dropped considerably during that time, hasn't it?

Joklik: From \$420 to about \$380 an ounce.

The mine opening was in August of 1989. Lieutenant Governor Nick Theodore attended. He was a popular politician, a man of average height, but strongly built. We had poured a gold bar and joked about how heavy it was. I said, "Governor, if you can pick



it up with one hand, it's yours." So, he rolled up his sleeve, and exposed a huge biceps. I had an anxious moment as he grabbed hold of the bar and strained to lift it. It weighed 400 ounces. The veins stood out on his neck with the effort, but he had to give up. Whew!

That was the first BP project we built and brought on stream.

### Greens Creek Silver-Zinc, Alaska; Major Ore Discovery

Joklik: The other was Greens Creek, Alaska. That project was in terrible shape when we took over. It was a classic example of rushing ahead, without having defined the basic assumptions. A mining rate of a thousand tons a day had been pulled out of thin air. The mine plan did not take into account the complexity of the orebody. There was no cost accounting system, no tracking of expenditures versus budget, no trending to update the estimate to project completion. I got an inkling of what had happened when I read the feasibility study. It ran to great detail about who was going to operate the mine and where they would live, but there was hardly a mention of who was going to build the project.

Swent: This was the BP board's baby--it came to you already approved.

Joklik: Yes. We sent Raman Rao and Al Nuttall up there. They came back aghast at what they'd seen. BP had an estimate of \$70 million to complete the project. It was clear to us that it couldn't be done for less than \$115 million, if that.

The first thing we did was to put in a top notch team, consisting of Al Nuttall to manage the engineering, procurement and construction, Ward Winborne as general manager, and Tracy Stevenson to establish cost controls. This was in October of 1988.

Swent: So, this was outside the Alaska Native Lands.

Joklik: Greens Creek is in a nonwilderness portion of the Admiralty Island national monument. The land is administered by the U. S. Forest Service. Juneau is just across the water from the project site. That's a government town, and the bureaucrats were watching closely what was going on. The Forest Service later held us up as an example of how to develop an underground mining operation in a sensitive environment.

The project was completed within our budget and schedule. After start-up in September 1989, we continued exploration drilling and found a major addition to the ore reserves. When the mine was opened, the estimated ore reserves were 3.5 million tons grading supposedly twenty-three ounces per ton of silver, .18 of an ounce per ton of gold, 4 percent lead and 10 percent zinc. Whereas we'd redesigned the project facilities, there wasn't time to revise the ore reserve estimates; nor to do confirmation drilling. The grades turned out to be over-optimistic. That's why our discovery of additional ore reserves, after start-up, was important. The new ore wasn't in thin lenses, like the mineralization previously drilled out. Instead, it was more or less equi-dimensional. The estimated ore reserves increased from 3 million tons to 13 million tons.

Early in 1993, we decided it would be best to shut down the operation and proceed with planning an expanded operation based on the new ore reserves we'd discovered.

Swent: Did you have to close it down to do this?

Joklik: Rather than selectively mining high-grade ore, we thought it best to preserve this material for a new mine plan.

Swent: So when the price goes up, you can reactivate it.

Joklik: Not just price. The expansion itself should be enough to make it a profitable operation.

Swent: And are they proceeding with that now?

Joklik: Yes. The mine is back in production. Now, let me tell you a little about BP and the "Gold Show."

#### "BP Gold Company," a Futile Exercise

Joklik: After the acquisition of Kennecott by Standard Oil and BP, there was talk about making a public company out of all or part of Kennecott. I remember a meeting in May of 1986, when some of my associates at that time, Don DeBrier, Jack Bernhisel, Byron Grote and I met with Frank Mosier and proposed making a public offering of Kennecott shares. This was spurred by the public interest in gold floats, as reflected by very high price/earnings multiples. The idea would have been to demonstrate the market value of Kennecott. The timing, as it turned out, would have been excellent. But Mosier didn't see it that way.

The idea of a public offering didn't die altogether and generated interest with BP, particularly after BP acquired the remainder of Standard Oil and, thereby, Kennecott. It eventually took form as a float of Kennecott's gold properties. Kennecott had all along produced gold from Bingham Canyon and was the second or third largest gold producer in the United States, after Homestake and Carlin.

Swent: Kennecott was seen as a copper company, but was also producing gold.

Joklik: The Bingham Canyon orebody runs .01 of an ounce per ton. That's not much less than heap-leaching grade for gold mines in Nevada. BP proposed a "bifurcation" of Bingham Canyon, a term nobody liked--one "fork" being copper, the other gold. The concept was potentially an accounting and operating nightmare.

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Joklik: The assets of the new gold company were to consist of the Bingham Canyon gold "fork," plus the "blue sky" of the Lihir project and mines under development at Ridgeway, Barney's Canyon, and Rawhide.

Swent: Now what was your part in this? Were you supposed to be--

Joklik: The ham in the sandwich, yes. N. M. Rothschild & Son and Salomon Brothers were designated as underwriters. Matters came to a head in September of 1988. By then, all regulatory requirements were fulfilled and the prospectus, or "red herring," had been prepared. There would be an offering, in a newly formed company called BP Gold, of 11,250,000 shares in the price range of \$16 to \$18 a share. BP would retain 85 percent of the common stock, and the rest would be owned by the public. The offering was going to be issued 50 percent in the United States and 50 percent internationally.

The structure of BP Gold was governed by a set of extremely complex agreements, because of the bifurcation of Bingham Canyon. BP Gold would pay Kennecott a mining and tolling fee of \$196 an ounce. Anything over \$196 would be allocated to BP Gold. Now, don't ask me how the price of \$196 was arrived at. We spent hours on calculations, but in the interest of--

Swent: Was that your job to determine the price?

Joklik: Yes, the whole exercise was our job. Although, we in Salt Lake had concluded we were going to miss the boat. Copper prices had risen a whole year earlier. We were to shut our eyes to the likelihood that copper, after seven years in the doldrums, was

going to be an attractive commodity in the financial markets. By 1988, Kennecott was already making a couple of hundred million dollars a year from our copper business. Meanwhile, the price/earnings multiples of gold stocks had declined from their peaks. The BP behemoth had taken too much time to work this gold float through the corporate system. We were afraid that while the strike price might indeed be in the range of \$16 to \$18, the price of the stock would then decline. We mentioned our misgivings in London, but the people who were promoting the float there were too deeply committed.

From September 5th to 9th we staged a "road show" in Europe. We made presentations in Edinburgh, London, Geneva, Paris, Frankfurt and Zurich. We came back from Europe, took a few days for a breather, and from September 12th to 20th, did a domestic road show, consisting of San Francisco, Los Angeles, San Antonio, Houston, Minneapolis, Chicago, Kansas City, Montreal, Toronto, Boston, New York and Baltimore. We were told by analysts that this was the glitziest road show they'd seen. It cost a bundle.

Swent: You were doing what--videos and all the rest?

Joklik: We had a marvelous video. I was the main presenter, supported by Bernhisel, DeBrier and Dimock. Gillam and Webster from BP also participated. Toward the end of our European road show, the gold price suddenly took a steep dive. It fell from \$420 an ounce to \$390. After the domestic road show, the underwriters had to admit they were not prepared to proceed with the offering. Most of us breathed a sigh of relief, because the last thing we wanted was to be associated with a well publicized failure.

That was our foray into the gold market. Gold dropped to \$350 an ounce. Our original concept of a Kennecott float would have been successful, because copper prices remained firm after the sharp rise in the fall of 1987.

Swent: It seems BP had a momentum of their own--

Joklik: Yes. They took a pessimistic view of copper. Because of their pessimism, the sale of Kennecott to RTZ took place the following year. RTZ's forecast of copper markets was right on the money.

Swent: So, it must have been satisfying to you to have been proved right, anyhow.

Joklik: Well, we were right only in theory.



Flambeau Copper-Gold, Wisconsin; Small but Rich

- Joklik: Another mine came on stream in early 1993 in northern Wisconsin. This was the Flambeau high-grade copper and gold mine. It was discovered by Kennecott long ago, in 1968. Development was held up for decades by environmental opposition, and by problems with devising a tax regime that would be acceptable to the Wisconsin state authorities and Kennecott. It's an open-pit operation, and the ore is shipped directly to Noranda. The ore runs about 10 percent copper and .2 ounce of gold per ton.
- Swent: So, the opposition was just that you were going to dig a hole in the ground.
- Joklik: Oh, they went to extremes.
- Swent: No air pollution or cyanide--no--
- Joklik: There was no likelihood of environmental damage. The opponents committed acts of violence. We suspect they also planted "endangered" species that weren't indigenous. The mine has a life of six years. Annual production is 20,000 tons of copper and 60,000 ounces of gold.

North Ore Shoot, Bingham Canyon; Underground Reserve

- Joklik: I should also mention the North Ore Shoot. This is high-grade copper and gold mineralization in limestone formations that partly surround the Bingham Canyon monzonite stock, at a depth of 3,000 feet. It's the downdip extension of the Carr Fork mineralization we talked about previously, that Anaconda tried to mine. But the grade of the North Ore Shoot is about three times what it is in the former Anaconda land holding. In the early 1980s, we sank a shaft 3,000 feet deep and did some bulk sampling for metallurgical purposes, and also some test mining. This is a large resource, whose economics look good when copper and gold prices are high and marginal when they're low. It would be a new commitment to undertake underground copper mining at Bingham Canyon, and that decision has yet to be made.

Pipeline Gold, Nevada; Discovery by Placer

Joklik: As we were talking about new precious and base metal projects, I forgot to discuss Cortez, Nevada. Now, I can't claim credit for Cortez because we inherited our 40 percent share from Standard Oil. The majority was owned by Placer Development. Cortez was a modest operation which had pretty well exhausted the oxidized ore reserves. They'd put in a pressure oxidation unit to treat refractory ore, which was losing money.

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Joklik: We decided to retain the property because we regarded it as an excellent geological environment. And, sure enough, Placer discovered the Pipeline gold deposit on this land; it's one of the most important gold discoveries in Nevada. Development was held up for some time by litigation between Placer and Consolidated Gold Fields, but is now progressing.

Swent: Does Kennecott still have this partial interest?

Joklik: Kennecott has a 40 percent interest and Placer has 60 percent.

Acquisition of Energy Minerals

Joklik: With the forced sale of Ray and Chino in 1986, Kennecott was left with only one major operation--Bingham Canyon.

Swent: May I ask, how did you feel about those sales?

Joklik: As I've already said, I opposed them strongly. And now, with the benefit of hindsight, the prices for which Standard Oil sold them were give-aways.

Swent: So, all the eggs were in one basket, then.

Joklik: That was part of the motivation for our continued exploration and development program. Lihir has the potential to become a major operation, but RTZ's ownership has been severely diluted. We looked at non-metallic commodities, where an acquisition might make a substantial impact on Kennecott's earnings and decided to concentrate on the energy minerals.

Green Mountain Uranium, Wyoming; An Ace-In-the-Hole

- Joklik: Although we were well aware of the history of uranium markets and uranium mining in this country, we thought that an opportunity to pick up a large, potentially low-cost source of uranium would be good strategy.
- Swent: Kennecott hadn't gotten into uranium at all in the 1950s when everybody else was jumping into it?
- Joklik: I don't believe so.
- Swent: Seems kind of strange to get into uranium now.
- Joklik: It goes back to my belief that, no matter what the commodity, if you make an acquisition that is potentially a large, low-cost producer, you're going to come out all right in the end. Such an opportunity presented itself with Green Mountain, Wyoming. These uranium deposits are in the Red Desert, about fifty miles north of Route 80, and fifty miles south-southeast of Riverton. The reason it's called Green Mountain is that it does stick up in the desert, has trees growing on it and breaks the monotony of the landscape. This had been an Anaconda property. When we looked at it, it was owned by a Riverton-based company called U.S. Energy, which is controlled by Jack Larson. Jack is a miner, with background in the Tintic District. Through sheer hard work and an intelligent approach to resource development, Jack has built up quite a company.
- Anyway, Jack had acquired this deposit, which has proved and indicated reserves of about 74 million pounds of  $U_3O_8$  in ore grading four pounds to the ton. It's ready to mine. We made a joint venture with Jack. What also came along at that time was the opportunity to buy Unocal's Sweetwater uranium mill, which is about fifteen miles north of Green Mountain. It was almost a gift.
- Swent: So the mine is not in operation.
- Joklik: No. The ore reserve is in flat-lying sandstone beds, to which mechanized mining could probably be applied.

The mill is in mint condition. The plant operated for only eight months and has been well maintained since. All it would take would be to drive twin inclines into the orebody, haul ore to the mill and get into production. It would be a large, low-cost uranium producer. Since holding costs don't amount to much, it's an ace in the hole, considering the likelihood that sooner or

later, with consumption exceeding production, there will be demand for this material. Spot uranium prices have recently risen from below \$10/lb  $U_3O_8$  to over \$15.

### Coal Business Re-Entry

Joklik: I've now reached a point where I can talk about Kennecott's coal interests.

#### Gregory South, Queensland

Joklik: As you know, coal and Kennecott are not strangers. We've already mentioned Kennecott's acquisition and subsequent divestiture of Peabody Coal. We began to take a second look at coal in 1979 and reconnoitered the Bowen Basin in Queensland for a possible entry opportunity. We found an undeveloped coal deposit in the southern part of the basin called Gregory South. The land was owned by Denham Coal Associates. We concluded a joint venture agreement with Denham and carried out a drilling program that defined several hundred million tons of excellent quality coking and steam coal. These reserves could be produced by longwall mining at a competitive cost. Australia already had at that time, in the early 1980s, made inroads into the Japanese market for steam coal and coking coal. Nevertheless, the quality of this Gregory South coal promised to be good enough to displace other suppliers to the Japanese market.

Swent: Was Utah Construction already there?

Joklik: They were the first major producer in the Bowen Basin.<sup>1</sup>

Everything looked promising for the Gregory South project until Standard Oil decided that control of the project should pass from Kennecott to Standard Oil's coal subsidiary known as Old Ben Coal Company. Whether through lack of desire to become involved in Australia or because of inadequate technical resources, Old Ben did not pursue the project. The property subsequently was purchased by Arco Coal. I believe it's been renamed Gordonstone,

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<sup>1</sup>For more on Utah Construction and Mining Company activity in Queensland, see Alexander M. Wilson, interview in process, Regional Oral History Office, University of California, Berkeley, 1996.



developed into a major mine and is producing coal for both domestic consumption and export.

### Selection Criteria

Joklik: Not discouraged by this experience, in 1989 we undertook another review of opportunities in the coal business. I stipulated selection criteria. We wanted western coal in large, low-cost, non-union operations. Low sulfur was essential because of Clean Air Act amendments which required reductions in acid rain pollutants, and set a cap on SO<sub>2</sub> emissions at 10 million short tons below 1980 levels. These reductions were to be achieved by the year 2000, by installing scrubbers or switching to low sulfur coal. We also stipulated that any operation acquired would need to have long-term contracts in place for most of the coal produced. We were looking for reserves that would last for at least twenty years. Most importantly, there had to be a willing seller because of the depressed spot prices for coal then prevailing and the questionable outlook for a substantial price increase.

### Powder River Basin Search

Joklik: We first looked at the San Juan, Uinta and Green River Basins and concluded that we should be concentrating on the Powder River Basin. The Powder River Basin had a lot of excess capacity. It was then producing about 170 million tons a year of the 780 million tons used for electricity generation in the United States, and could have supplied more.

### Cordero Mining Company

Joklik: The first property we examined was Caballo Rojo, owned by Mobil Oil. The property was for sale as a non-core business. It was producing about 9 million tons a year, but had infrastructure for expanding to 20 million tons. We put in a bid but were beaten narrowly. Having tasted blood, we continued and came up with two more opportunities. First was the Cordero Mining Company, a subsidiary of Sun Oil Company. This was the sixth-largest coal mine in the United States, producing 14 million tons a year, with

potential to increase to 17 million tons with little capital investment. The reserves were on the order of 400 million tons, and more than 60 percent of the output was sold on long-term contracts.

We agonized over what we should bid, made a decision in January of 1993 and were successful.

Swent: Were these sealed bidding situations?

Joklik: Yes.

#### NERCO

Joklik: At about the same time, we had got into discussions with NERCO, an 82 percent-owned subsidiary of PacifiCorp. The remainder of the shares were privately owned. NERCO had two properties in the Powder River Basin, the Antelope mine and the Spring Creek mine, and also a 50 percent ownership of the Decker mine. Together, they produced nineteen million tons a year, two-thirds of which was sold under long-term contracts. NERCO had been attempting to sell their gas, oil and minerals interests. That's how we got talking with them.

Swent: But not coal.

Joklik: They didn't intend to sell the coal, right. But, PacifiCorp had suffered a big loss in 1992, as well as a substantial drop in share market value. That's why they were interested when we suggested our buying not just the minerals, oil and gas, but also the coal.

Swent: And where is PacifiCorp?

Joklik: In Portland, Oregon.

Collectively, their reserves were large, with heat content of coal above average for the Powder River Basin, and relatively low sulfur.

Swent: So this fulfilled all of your criteria.

Joklik: Yes. After some tough negotiation, in which RTZ also participated, the price per share for NERCO was agreed on and the transaction was closed.

Swent: This wasn't a bidding process?

Joklik: No.

Swent: Which one is more fun?

Joklik: You can put a lot of work into sealed bids and finish up with nothing. But, you've got to be in it to win it.

We eventually sold the oil, gas and minerals businesses for a good price.

Swent: Did you sell them all as a package?

Joklik: No. Oil and gas were sold separately, as were the precious metal properties, the Con, Candelaria, Delmar and Cripple Creek mines.

#### Kennecott Largest PRB Producer

Joklik: Kennecott came out of the transaction well. As for PacifiCorp, they escaped from a tough financial situation. With 19 million tons a year from NERCO and 14 million tons from Cordero, a total of 33 million, Kennecott became the largest individual coal producer in the Powder River Basin. Since this is low-sulfur coal, the radius over which it can be profitably shipped is likely to increase. The spare capacity in the Powder River Basin will ultimately be used up, leading to increases in the coal price. The acquisitions were made on conservative coal price assumptions. The purchase price was pitched to where profitable operations would result, even without increases from the current spot price.

This was a major acquisition, which could be regarded as a second wing for Kennecott.

Swent: You didn't try to keep any of the minerals that were sold?

Joklik: No. They were looked at closely. They didn't measure up.

Swent: Did NERCO take long?

Joklik: To do what?

Swent: The NERCO negotiations.

Joklik: No. Just a few months. We started talking to them late in 1992. As I said before, our study of a potential coal acquisition had

been going on since 1989. Cordero and NERCO were acquired during my last year at Kennecott.

Swent: It sounds as if you are very satisfied with them.

Joklik: Very much so, yes.

Swent: Good.

#### Diamond Exploration, Northwest Territories

Joklik: This leaves us with just one more subject in the new business category, and that's another form of carbon which is not black, but brilliant white. Diamonds.

Swent: This is something new.

Joklik: Yes.

Swent: You're talking about gem diamonds rather than industrial ones?

Joklik: Definitely, gem quality diamonds.

#### Discovery by Charles Fipke

Joklik: This came about in 1990, when BHP seized an opportunity presented to their Canadian exploration manager, Hugo Dummet.

Swent: This is BHP, Broken Hill Proprietary Ltd, not BP.

Joklik: Yes. The opportunity was presented to Hugo by a geologist named Charles Fipke, who spent eight years tracking diamond indicator minerals eastward from the Mackenzie River.

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Joklik: He had worked his way "upstream," against the direction of glacial drift to the Lac de Gras area in the Northwest Territories, where the concentration of indicator minerals such as certain types of garnet and diopside increased dramatically. He found kimberlite pipes which yielded "macro" diamonds, weighing more than half a carat.



It didn't take much geological sleuthing to recognize that this area was highly prospective for other diamond discoveries. This is a stable portion of the pre-Cambrian Slave Province. The theory is that during the Jurassic Period, arching of this craton permitted diabase and kimberlite to come from as deep as 120 kilometers and occupy tension fractures closer to the surface. The diamonds must be formed under the right temperature and pressure conditions at depth. Tectonic events then facilitate their transportation and emplacement.

### Land Acquisition by Kennecott

Joklik: Tom Patton, our vice president of exploration and I asked, "Should we toss our hat in the ring?" We were encouraged by the fact that RTZ had diamond exploration going on in various parts of the world. They were all for it. I then said: "Every year we waste all kinds of money on moose pasture. Here we have the opportunity to acquire land adjacent to what could be the first discovery of economic diamond mineralization in a totally new geological province." We set about an aggressive land acquisition program. At first, we didn't have much competition. We made deals with several junior explorers--Aber, DHK (a consortium of three small companies) and Kalahari (owned by an entrepreneur named Bert Applegath). In 1990 and 1991 we acquired over three million acres. The other major players were BHP and Anglo-American.

We went in with the knowledge that many kimberlite pipes would have to be discovered and tested before we found one that would make a mine. We were guided by aeromagnetic maps which showed swarms of dikes trending north-northwest, a reflection of the arching that had taken place. There are several other sets of dikes. Some pipes are related to intersections of dikes. The pipes commonly coincide with distinct, rounded magnetic anomalies. In the summers of 1991 and 1992, we identified several drilling targets.

We had our first bit of excitement in the summer of 1992 when Lakewood Laboratories called to say that a macro-diamond had been found in the first sample from a drill hole. I sent a fax off to Bob Wilson in London. The following morning, Tom Patton called and said, "Hey, the lab phoned again. They said it's a macro diamond, but it belongs to someone else." They'd gotten the samples mixed up.

Concerning another pipe, the lab called to say, "You've got a bunch of micro diamonds in this one, not only that, some of them

are yellow." Yellow diamonds, you know, command a premium. Well, they called back and said, "We thought we could tell yellow diamonds that come off drill bits from the real McCoy."

In late 1992 we began to get appreciable numbers of macro-diamonds in samples from several pipes. I visited there with Tom Patton in May of 1993. Our camp was 180 miles northeast of Yellowknife. The scenery consisted of stark plains covered with ice and snow, with just an occasional hump bearing a few blades of grass or a shrub. I don't know what the caribou eat, but that diet seemed sparse. The kimberlite is soft and forms depressions in the plains which measure several hundred feet across. We flew over the original discovery by Fipke and BHP. You could fly over that site and think of it as just another of a million little lakes.

#### Mine Development Potential

Joklik: We were spending money on this project at a rate of about five million dollars a year at the time I retired. Now I understand bulk sampling is under way and there's a good chance one or more diamond mines will be developed by Kennecott.

Swent: Diamonds don't need a lot of processing.

Joklik: No.

Swent: Just brush them off.

Joklik: Because kimberlite is soft, it's cheap to mine. Processing costs only a few dollars a carat. The question is, can the market stand development of another major gem quality diamond province?

The fact is with any commodity, once exploration comes into vogue, discoveries follow.

Swent: That's exciting.

Joklik: Well, I think we've pretty well covered new developments.

#### Conversations with Armand Hammer

Swent: I would love to have you tell a little about Armand Hammer.

Joklik: Oh, that! He died a few years ago, at age ninety-two.

Swent: I think so.

Joklik: He used to say to me, "Frank, they recently put a new battery in my pacemaker. It's good for ten years, so I'm going to live until after the year 2000 because if not, you know, it will have been a waste to get this new battery put in."

I first met him at a luncheon in the LDS Church Office Building which was just across the street from my office. Jon Huntsman, owner of Huntsman Chemical hosted the luncheon. He had joined forces with Hammer to provide earthquake relief in Armenia. We chatted for a while. He knew about Bingham Canyon, and introduced me to a lady in her late forties. She was his "personal physician" and travelled with him. Her father happened to have been the last general manager at Cananea, before the mine was nationalized. I visited with her for a while. Hammer got interested, asked for my card and said he'd been wanting to participate in Mexico's mining business.

I'd forgotten about our conversation until a month or two later, when he called and said, "Well, it seems the government is putting Cananea up for tender and maybe we should put in a joint bid." I said, "Why not." Hammer didn't have much technical knowledge, so I helped him. In the end, we did not put in a bid.

I remember Armand at the 1990 Goodwill Games in Seattle. The opening ceremonies were in Husky Stadium. Ted Turner was there with Jane Fonda. It was an unseasonably hot July day, about 90 degrees. There were several speakers, including Arnold Schwarzenegger. The sun was beating down on the stage. Armand Hammer, aged ninety, bounded up the steps, dressed in a dark business suit. He delivered a ten-minute speech, without notes.

He told me his version of how he got rich in Russia. He went over there as a medical student, initially with the idea of funding medical research. He got distracted and made a deal with Lenin, whereby he would supply a million bushels of wheat to alleviate the famine of 1921. In return, he asked for two things: (a) he wanted title to a mine in the Urals that produced asbestos for the European market, and (b) he said, "Look, you have great potential for educating your young people, and what is the one thing they need? They need pencils to write with. So, I want the monopoly on producing pencils." Lenin said, "Okay." It turned out to be a profitable enterprise.

He later withdrew from Russia because he couldn't get along with Stalin, whom he regarded as a murderous maniac. He went back

after the war to negotiate barter deals, such as phosphate rock for ammonia. I never thought this deal would work out. But it did, and he made himself a lot of money.

He was a deal-maker extraordinaire, and was still looking for deals when I knew him. That's what kept him going--until the battery gave out on him. He always came on very low-key. He'd call and say, "Hey, Frank, what's up?" and go from there.

Swent: It might be fun to work with someone like that.

Joklik: Well, I don't know. There may have been organization charts in Occidental Petroleum, but Hammer would talk to anyone. This was great for their egos, but played havoc with the organization. The turnover of the top echelon was pretty rapid. Still, he was a person who made things happen.

Swent: Well, he had a tremendous influence. What was the conference he started in eastern Canada?

Joklik: It was in Nova Scotia, right? Pugwash.

Swent: Pugwash, that's right.

Joklik: There was an article about Hammer in the September, 1996 issue of the New Yorker. Not very flattering.

#### Retirement from Kennecott

Joklik: You know, we talked about my retirement from Kennecott which took place in May of 1993, when I turned sixty-five. I didn't know what to expect, how I'd feel about it. Let me give you the bottom line. I found it difficult to say goodbye to the people I'd worked with. As I think I mentioned before, these were not just my colleagues at headquarters. Saying goodbye to the hourly people also was difficult. When you're running a large company you have meetings with hourly people collectively more often than individually. As I've already said, before I left, I talked with many of them, one on one. And I'd say to myself, "There's a hell of a nice guy and here I've been all these years and never really got to know him."



### Three Changes of Ownership ##

Joklik: Apart from these personal regrets, I retired with a light step. I remember the last time I left my office. I certainly didn't cast sad looks around. I was actually elated, for a couple of reasons. Memorable things had happened, events we've described in the course of this conversation between you and me. But you must also remember that, during those thirteen years, there were three changes of ownership which were not without problems. I sometimes thought I could have used time spent on smoothing transitions doing something more constructive. This was a source of frustration which had now come to an end.

### Mission Accomplished

Joklik: The second reason for my good humor had to do with a feeling of mission accomplished. The cost reductions of the early eighties were difficult but effective. The modernization of Utah Copper ensured profitable operations over the remaining mine life. Investment in precious metals, coal, and diamonds relieved Kennecott's dependence on revenues from copper. In short, the Company should do well for many years to come.

### Historical Note<sup>1</sup>

Joklik: In March 1997, the newly merged RTZ-CRA Group announced a world-wide reorganization along commodity lines. Kennecott Utah Copper joined a copper group, headquartered in London. Kennecott's Powder River Basin coal mines became part of an energy group, based in Brisbane. The North American precious metals mines and the Lihir Island gold mine were incorporated in a gold group, managed from London. Kennecott's corporate Salt Lake City headquarters were disbanded. RTZ-CRA then adopted the name Rio Tinto Company.

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<sup>1</sup>Mr. Joklik brought the following news item to my attention during the final processing of this volume. --Ed.

## VIII FAMILY LIFE IN SALT LAKE CITY

### Cultural Attractions

Joklik: Many people in the community wondered what the Jokliks would be doing after my retirement. Well, that question came up during the series of farewells that took place at the end of May, 1993. A memorable one was in the foyer of Symphony Hall, an elegant dinner at which speakers included the governor of the State of Utah, Mike Leavitt; the preceding governor, Norman Bangerter and Bishop Weigand. About five hundred community leaders attended. There were many emotional exchanges.

Pam and I had decided some time before that we were going to continue to be headquartered in Salt Lake City. When we arrived here, in 1979, I already was quite familiar with the city and its lifestyle from dozens of previous visits to Kennecott's operations. But Pam knew little about Salt Lake, and it took her time to discover what this area had to offer, compared to where we came from in Connecticut. We had led a very peripatetic life prior to then. I mean, we got married in 1962 in the Cotswolds in England, and six months later we went out to Australia for Amax. We had two years in Sydney and then three in Perth, where we brought the Mount Newman project to fruition. Carl, our older boy, was born in Sydney in January 1964, and Katie, our daughter, was born in Perth in October 1966. Then we left Perth to go to Greenwich, Connecticut, headquarters of Amax Aluminum Company, and had three years there. Paul was born in January, 1970. After three years, we moved to Hillsborough, California, still with Amax Aluminum, and then back to the east coast, this time to Darien, where we actually had five whole years after I rejoined Kennecott. That was, by then, the longest we had been anywhere. From there to Salt Lake City in 1979. Here we've spent seventeen years in one location!

Swent: A lot!

Joklik: Unbelievable!

Swent: You haven't said anything about citizenship. Are you naturalized?

Joklik: Oh, yes. From 1981, I was doing a great deal of lobbying in Washington. I said to myself, "If you're going to meet with legislators, as well as leaders of the administration, your pitch would be more convincing coming from a U.S. citizen."

Swent: Had you become a Commonwealth citizen?

Joklik: Australian, yes.

Swent: You had to be naturalized there.

Joklik: When I turned twenty-one and joined the Bureau of Mineral Resources in Canberra.

Swent: And Pam was an English--

Joklik: Pam was British and still is. I would have been happy playing out my career in Australia. It wasn't a question of lifestyle or remuneration that attracted me to this country. It was a desire to continue contributing. I've seen major changes in the United States in the years since 1953, when I first came here. I think they've mostly been changes for the good. The most striking feature about this country is a quality of tolerance which is not found elsewhere. I've noticed that in British corporate board rooms there's more destructive criticism than there is here. In corporate America, people are just as good as anyone else at inserting a knife between the shoulder blades. But in day-to-day business dealings, the level of tolerance for the other person's point of view is certainly higher here than it is in Britain, or in Australia. That's important. It helps hold this country together. That's why I think recent emphasis on perpetuation of ethnic diversity is counter-productive and hopefully will not lead to debilitating divisions.

Swent: Let me just, for the sake of clarification, I have your two older children as American citizens--

Joklik: No, they're not.

Swent: They're still Australians.

Joklik: Yes.

Swent: Paul, of course, has--

Joklik: Dual citizenship.

Swent: So, you decided to stay here in Salt Lake.

Joklik: Yes. Several strings tied us here; apart from that, the lifestyle is pretty attractive.

In Darien, Connecticut, where we previously lived, you're in a small community. Most of the inhabitants are commuters. Everybody says "Isn't it wonderful that we can go to the Met anytime, or to the theater to see the latest show." Sure you can. I remember sitting in the Met or the theater, with my concentration ruined by the thought that in an hour or two, we'd have to go out, find our car and then have an hour or more of hard driving to get back home. Well, the result was we didn't often go into town to take advantage of the tremendous cultural attractions of New York City; and the groups that came into Darien to perform in the local high school auditorium were not world class.

Swent: Whereas in Salt Lake--

Joklik: We found Salt Lake to be a surprisingly livable place. It has a cultural life which is remarkable for a community of this size. If you include Ogden and Provo, you're talking about a million people. The symphony is ranked as one of the top ten in the country. The hall in which they perform was completed about the time we came, in 1979, has tremendous acoustics, cost between \$10 and \$15 million to build and, for the money, is one of the best. Now, compare that with the Sydney Opera House which was built while we lived there and cost \$150 million.

Ballet West is recognized as being amongst the best three troupes in the country; it's a function of the University of Utah having a superb school of dance. The Utah Opera was in its infancy when we came. It was founded by Glade Peterson, who had been the leading tenor at the Zürich opera for years, came back to his native state, and founded the Utah Opera company. When Glade died quite young, a few years ago, he was succeeded as general director by Anne Ewers. She's a most gifted person artistically, as well as an effective administrator. She's getting to be well known nationally and overseas. Our problem is going to be holding onto her. Recently we had a production of Macbeth, not one of Verdi's best-known operas. As with most others, it was sold out, with people scalping tickets. A new work, "Dream Keepers," was staged to coincide with our State Centenary, early in 1996. There was critical acclaim in New York and London.

Swent: And, let's mention that you've been extremely active on this board.



Joklik: Well, that's a labor of love. Unfortunately, I recently had to resign as president because of too many other time commitments.

Then there are opportunities for participating in sports. We ski on "Utah Powder." As they say on the car license plates here, it's the "greatest snow on earth." Golf and tennis are readily available in the summers. We have found living here very easy.

Swent: How many minutes is your commute?

Joklik: Ten minutes from home.

### View of LDS Church Presence

Joklik: When we were hiring people for Kennecott from out of state for senior positions, they'd say, "Well, I'd like the job;" but the wife might add, "You know, it's going to be difficult with the LDS church; our kids will be discriminated against in school..." But I haven't found that to be a problem.

Swent: That has changed a lot.

Joklik: I'm not sure that it has changed that much. There were periods in the history of the various churches when relations between them were even better, perhaps, than they are today. A matter that caused me much concern was the sale of Holy Cross Health Services of Utah to a for-profit organization called HealthTrust. I was on the board of Holy Cross and disagreed with the plan to sell. Holy Cross had a tradition of 120 years of charitable health care administered by the Sisters of the Holy Cross. A proportion of the funding they received over the years came from LDS sources, which probably would not have been made available if the sale to a for-profit organization had been anticipated.

Of my couple or three hundred best friends here in Salt Lake City, I couldn't tell with half of them whether they were LDS or not. Maybe they gave me up as a lost cause when we moved here and never tried to convert me.

Swent: You've been a big supporter of the Roman Catholic Church here.

Pam's Contributions to the Community

Joklik: Pam and I have been involved in a number of church projects. We supported the fund drive to renovate the Cathedral of the Madeleine. Kennecott donated to Catholic Community Services a building on Redwood Road which once housed the Exploration Research Group. Pam headed up several fund raisers for Judge Memorial Catholic High School.

Pam's involvement in causes is legion. Everybody in town knows that if you don't get Pam to help, you have less of a chance of success. I can't enumerate them all, but an example is the Children's Museum of Utah which was faltering when she took over. Through a vigorous fund raising drive and reorganization, she put this museum on its feet. For this she was honored at a formal dinner attended by community leaders and members of the Utah Congressional delegation. She's a member of the Advisory Board of the University of Utah and has been chair of the University's Fine Arts Council. When our children were swimming for the Fort Douglas Club, she chaired the swim league of the Salt Lake Valley. At the same time, she was on the board of the Snowbird Ski Race Team. When Our Lady of the Snows chapel at Snowbird was wiped out by an avalanche, she got together the money to rebuild it. For years she has been active on the board of the Utah Symphony, including marketing chair. Last year she was honored for her community service by the Utah National Guard when they presented to her their Minute Man award.

The Kennecott Visitors' Center Museum at Bingham Canyon was largely her doing. I was initially opposed to it. But when my colleagues in the company lined up with her and said it was a good idea, I waved the flag and cried, "Wait for me! I'm your leader!" It's now one of the mining industry's show pieces. We get 200,000 to 250,000 visitors every year. The museum has wonderful educational value.

Pam's on the boards of many other charitable and educational institutions. In addition, she manages our real estate investments. She's a wizard at renovating older houses. Her artistic penchant is also expressed in her love of antiques. Our house is full of antique furniture. She's starting up an antiques business. She buys in England and France, and sells in Salt Lake City and the Park City-Deer Valley ski resorts. Her sister Claire, who lives in England, has been helping her.

### Family Activities

Joklik: Skiing has been a great family sport for all of us. Pam and I still very much enjoy skiing. I get out about thirty days a year, including only the time between Christmas and New Year plus weekends. Skiing now is a magnet for our kids who live in other parts of the country. In fact, they tend to bypass our house, go up to our condominium at Snowbird and hole up there. We bribe them with meals and basketball tickets to come down.

We've had some interesting family trips. House boating on Lake Powell is an excellent vacation. We've done that three or four times. One of those nearly ended badly when a storm came up suddenly. Carl, our eldest son, had climbed a ladder on the houseboat, slipped and gashed his shin, exposing six inches of bone. We jumped in the ski boat and raced to the Dangling Rope Marina, where we found a park ranger. She took Pam and Carl in her boat and headed for Wahweap to try and get him to the Page hospital. But a storm came up and they ran into extremely rough water. They were in immediate danger of foundering and radioed for help. Fortunately, the ranger boat from Wahweap was able to come out and rescue them.

Carl works for Culligan, a company that manufactures and markets water softeners. He and Katie went to high school at Philips Exeter Academy in New Hampshire. Katie graduated from Duke University and went on to obtain her MBA degree there. She joined the Coca Cola Company in Atlanta and is a rising star in their marketing group. She recently married a handsome young man from Rhode Island. Paul attended Judge Memorial High School, graduated from Duke University, received his law degree from Georgetown University and works for the Senate Judiciary Committee in Washington, D.C. Paul and Katie's choice of Duke for their undergraduate studies was partly influenced by my brother's presence there. He and his wife, Pat, kept an eye on them and hospitably supplemented their college rations.

I should mention that, just recently, Katie was offered and accepted a new assignment by Coca-Cola in Australia. Sam also wants the experience. It's a senior marketing position, based in Sydney. Isn't that exciting? The third generation of Jokliks to invade Sydney! My parents and us kids in 1938; Pam and I in 1963, after which Carl and Katie were born in Australia; and now, Katie and Sam in 1996! The move is supposedly for two to four years, but who knows? I suspect the 2000 Summer Olympics will be part of the attraction.

Swent: And you have also been very involved in community activities as well.

### GFJ Activities

#### Eccles Bank, Mining-Related Boards

Joklik: Soon after coming to Salt Lake in 1981, I joined the board of First Security Bank, known as the "Eccles family bank." Marriner Eccles was chairman of the Federal Reserve Bank in the nineteen thirties and forties. His nephew Spencer, a good friend of mine, is now chairman. I've remained on this board and more recently began serving on the board of Cleveland Cliffs--a nice fit with my Mt. Newman experience. I chaired the Copper Development Association for several years in the 1980s. This is an industry group that brings together copper producers and fabricators. Of course, throughout my tenure as CEO of Kennecott, I was on the board of the American Mining Congress.

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Joklik: In February 1989, I was named "Man of the Year" by the Copper Club. This award is given annually when the copper industry gets together for dinner at the Waldorf in New York.

#### National Academy of Engineering

Joklik: Later in 1989, I was elected to the National Academy of Engineering. The nomination was initiated by Jim Boyd, for which I was grateful. Don Dahlstrom of the University of Utah took over after Jim died. I've served on several committees of the academy and in 1994 chaired an international conference on industrial ecology.

The AIME (American Institute of Mining & Metallurgical Engineers) awarded me the Saunders Gold Medal and the SME (Society of Mining Engineers) Distinguished Member award. I believe that was in 1991-1992.

One of the most memorable events was the Society for the Prevention of Blindness annual dinner here in Salt Lake in 1992, honoring Pam and myself. We had a great time being interviewed

for the video. There were testimonials from Senators Garn and Hatch and Governor Bangerter. Ian McGregor participated in the video, as did Peter Grace, John Sullivan and several community leaders.

Swent: I certainly enjoyed seeing it. It's a wonderful tribute for both of you.

Joklik: It was fun. Pam was enthusiastically praised, which was well justified by the important role she has played in the community.

#### Giant in our City Award, Honorary D.Sc.

Joklik: More recently, Pam and I were honored when I received the Giant in our City Award from the Salt Lake area Chamber of Commerce. This was recognition by the community.

At the June 1994 commencement exercises of the University of Utah, an honorary Doctor of Science degree was conferred on me. My brother, who has been the recipient of countless academic distinctions, did me the favor of coming from Duke University to attend.

#### British Honorary Consul

Joklik: In February, 1995, I was appointed British Honorary Consul at Salt Lake City. At the appointment party, given by Merrick Baker-Bates, the British Consul General, in Los Angeles, I commented on the logic of selecting for the post an Austrian who grew up in Australia and held U. S. citizenship.

My duties as consul haven't been onerous. March 1996 was designated UK-Utah month, during which cultural, academic and business events featuring Britain were held throughout the state. Pam chaired the arts program. The highlight of the month was a one-week visit by Lady Margaret Thatcher. A gala dinner was organized as a fundraiser for the arts. As consul, I was asked to be master of ceremonies. Between Pam and myself, we took good care of our honored guest. She spoke for fifteen minutes longer than scheduled when she got carried away by her favorite subject--the aftermath of communism in Russia and China. I'd read a couple of her biographies which I found to be accurate. Both are portraits of an extremely hard-working, ambitious, inflexible



woman whose position in public life was eventually eroded by changing times. Pam and I enjoyed her company. The "Iron Lady" does have a soft side.

What helped tie us to Salt Lake, after my retirement from Kennecott, was that we started building a new house. We'd owned the building lot for twelve years, but refrained from going ahead with construction because we were too busy. The house was completed just before my retirement.

Swent: It's a very beautiful house.

Joklik: Well, thank you. It's Pam's design.



## IX CAREER IN THE OLYMPICS

Swent: Tell me about your new career in the Olympics. How did you come to be involved with this?

Joklik: I've been interested in sports and the Olympic movement for as long as I can remember. On an even broader scale, I've always recognized and respected the mental and physical effort that's required to achieve excellence, whether it's in sports, in business, the arts or in technology. I feel that striving for excellence is a vindication of the human spirit. I believe that our presence on earth obligates us to use our talents and that it's, therefore, important to inspire our young people to do their best in their physical, intellectual and inter-personal endeavors.

My participation in winter sports began when my brother and I learned to skate in Vienna. I started skiing much later. As I've already related, I contracted infectious hepatitis during field work on Gaspé Peninsula and took up skiing to get back in shape. This gave me a start for skiing regularly at Lac Beauport, near Québec City. When I went to Europe for Christmas, 1957, to spend time with my father (my mother had died the year before, in 1956), he staked me to ten days' skiing at Zürs, in the Vorarlberg. When Pam and I got married, she had already done a little skiing. I've related our adventures at Lech, on our honeymoon, and later, in the Australian Alps at Mt. Kosziusko.

Upon our return to North America, skiing became our family sport. Our children started when they were five years old and we all still enjoy skiing. Paul joined the Snowbird ski team and became an excellent racer. Carl and Katie weren't far behind him. Pam and I like to run gates for fun. She's been called a "ringer" because she doesn't look that fast until you see her times.

Swent: We should comment on the beautiful view of the fresh snow on the mountains here, and you're itching to be out there.

Joklik: Yes, we had a good fall last night. It's tempting to make use of it.

Utah began to attract attention internationally as a major ski destination when we had the first World Cup opening at Park City, in March of 1985. The event was organized by Nick Badami, who had bought the Park City ski resort several years previously. They ran a men's giant slalom. It attracted all the big names of that time. Stenmark was still racing, and Ghirardelli was the winner. But the memorable thing about it was the ambience. Snow conditions were superb, and 13,000 spectators showed up. At the prize presentation, Sergio Lange, who then was Mr. World Cup Skiing, remarked on the enthusiasm of the crowd. It was an auspicious opening, and there have been World Cup events in Park City every year since then.

#### Bid for the 1998 Olympic Winter Games

Joklik: Now, Salt Lake had previously bid for the Winter Olympics. The city lost to Sapporo for the 1972 Games. Salt Lake also bid unsuccessfully for 1976 and 1992. I first got seriously involved in our bid for the 1998 Games, joined the board of the bid committee in March, 1990, and worked hard at fund raising in the local community and with Kennecott's suppliers.

Our chances initially looked good. The United States Olympic Committee selected us as the U.S. candidate for 1998, after elimination of Denver, Squaw Valley, and Lake Placid. The International Olympic Committee was scheduled to elect the host city for the 1998 Winter Games at its plenary session in Birmingham, England, in June, 1991.

#### **The Atlanta Factor**

Joklik: Nine months before Birmingham, we received news that Atlanta had won their bid for the 1996 Olympic Summer Games, in competition with Athens, Melbourne, Toronto, and others. Athens was the favorite. Pam and I happened to be on vacation in Greece when the IOC voted for Atlanta. Of course, the Greeks were dismayed, because they thought they had it in the bag. This was a mistake cities had made before, when they assumed they'd win, relaxed their efforts and treated the International Olympic Committee with arrogance. We were happy for Atlanta, but knew it was

inconceivable that, so shortly after Summer Games being awarded to the United States, the following Winter Games would also be awarded to our country. Although we briefly considered withdrawing, we realized withdrawing could give us a black eye with the IOC.

I should explain that the IOC had shortly before decided to chronologically separate the Winter Games from the Summer Games. Traditionally, Winter and Summer Games had been held in the same year, every four years. But, as of now, the Winter and Summer Games were to alternate, every two years. This brought about a break in the four-year spacing of the Winter Games. The 1980 Games were in Lake Placid, 1984 in Sarajevo, 1988 in Calgary, 1992 in Albertville. But now, there would be another Winter Games two years later, in 1994, in Lillehammer, Norway. This is why we were bidding for the Olympic Winter Games of 1998.

#### Good Fortune with IOC Visits

Joklik: In the winter of 1990-1991, we entertained fifty-five IOC members who came to visit us and inspect our facilities. Some visits coincided or overlapped, but most required individual attention.

Swent: That must be enormously expensive in money and energy as well.

Joklik: Yes. You have to receive them when they can afford the time.

Swent: So, they weren't here necessarily in the winter.

Joklik: Not necessarily. Some came in the summer. You show them the facilities, and they have to use their imagination. Of the ninety-five IOC members, only a handful had experience in winter sports. Yet they all were entitled to vote.

We had good fortune that winter of 1991. We had massive snow falls that coincided with the most important visits of IOC members. They appointed a site selection committee, consisting of four IOC members and lots of IOC staff. The day they arrived we had a three-foot snowfall in the mountains. When President Juan Antonio Samaranch paid us a visit later that winter, in March, we were out at the airport and had a brass band to welcome him. As he stepped off the plane, it began to snow.



### Pam Organizes Salt Lake Delegation

Joklik: As the June 15, 1991 deadline drew near, we prepared to make our presentation in Birmingham, England. We took a contingent of Salt Lakers over with us. This group consisted of 250, all paying their own way. Their accommodation, activities, and entertainment were organized by Pam. She had the responsibility and it was appropriate, because of her background. She knew exactly where to go. She arranged marvelous one-day tours to beautiful old homes and castles in the Cotswolds and other beauty spots. The presence of our delegation demonstrated to the IOC members the strength of our community support.

The other competing cities were Nagano, Japan; Jaca, Spain; Aosta, Italy; and Östersund, Sweden. Sochi in the Soviet Union dropped out. The Japanese brought a contingent of about 600 people. They put on an almost continuous program of music, folk dancing, and cheerleading.

Swent: What did Salt Lake do?

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Joklik: We and other bid cities had hospitality suites in the Hyatt Hotel, where the IOC members were staying. Our suite was decorated by Pam and her helpers. It had a western flavor. A string band we'd brought from Salt Lake played western songs, there was a well-stocked bar and we offered plenty of good things to eat. The IOC members would come in for a chat. Of course, we already knew most of them from their visits to Salt Lake City.

Pam also had rented a mansion with a beautiful garden, some distance from the center of the city. It was owned by a lawyer and his wife. We brought over from Salt Lake City Tom Sieg and his partner, Tom Guinea, who own a chain of restaurants in Salt Lake City. In addition, we flew in more than five tons of food and cooking equipment. We set up a superb restaurant in the mansion, to which we invited IOC members for luncheons and dinners. We had virtually all of them show up, on one occasion or another, to be entertained at what became the Salt Lake City home in Birmingham.

Swent: Quite a brilliant idea.

Joklik: It was quite an undertaking. Pam received many accolades for organizing the delegation to Birmingham.

### Final Ballot: Nagano 46, Salt Lake City 42

Joklik: On voting day, June 15th, we assembled in a hall of the Queen Elizabeth Convention Center which had been opened by Her Majesty only several days before. The candidate cities' delegations were assembled. After a replay of some videos to settle the audience down, the IOC members made their entrance and lined up on the stage. President Samaranch strode to the podium, put on his glasses and fumbled for a piece of paper he carefully unfolded. He cleared his throat and said, "And the winning city is...Nagano." The Japanese delegation, which was by far the largest, erupted in what sounded like banzais. We learned we had lost in the final ballot, by 46 to 42. It was that close. We were crushed. On the other hand, we recognized that, after the Atlanta decision, to come so close to winning was an achievement.

### Decision to Bid Again

Joklik: The following morning, Governor Bangerter, Spence Eccles, Verl Topham, Ian Cumming, Tom Welch, Dave Johnson, myself and several other supporters met in a room at the Swallow Hotel to hold a post mortem. We concluded that we should take a hard look at bidding again.

We came home, were greeted enthusiastically at the airport and found that the public reaction to our narrow loss was remarkably positive. It seemed to us there might be enough support for another bid.

The question of bidding again was tied to the fact that in November of 1989, a referendum had been held in Utah, asking the people of the state (a) whether they favored hosting the Olympic Winter Games and (b) whether the people would agree to using a small portion of sales tax revenues to finance the construction of the required sports facilities we didn't already have.

The Salt Lake area already had most of the venues for Alpine and Nordic skiing competition, but we lacked ski jumps, freestyle training jumps, a bobsled and luge run and a speedskating oval. The referendum vote came out two to one in favor. These facilities were to be constructed irrespectively of whether or not we won the Olympic Winter Games and would be used as a western United States training facility for winter sports athletes. The USOC said, "If you commit to doing this, you will not only be our

candidate for the 1998 Games but, if you lose, for the 2002 Games as well." This was too good an opportunity to waste.

The problem was how to finance another bid campaign, with the next vote four years away, in 1995. It would be hard to again turn public enthusiasm into hard cash. We'd have to build on the friendships already established with IOC members and keep Salt Lake fresh in their minds.

Swent: Let me ask one thing. The people that you had cultivated. Are they the same people? How much change is there in the IOC?

Joklik: There's little change. Until recently, election to the IOC was for life. They established a retirement age of seventy-five, and recently extended it to eighty.

Swent: You have been able to build on what you had done before.

Joklik: Yes. We estimated the turnover from 1991 to 1995 at 10 to 15 percent.

Swent: Roughly how much did you spend for the Birmingham bid?

Joklik: We spent just under \$6 million.

Swent: Which you had to raise.

Joklik: Yes.

Swent: The assumption is that the community gets that back if they get the Games.

Joklik: Yes. There are economic benefits. More importantly, young people develop an interest in sports.

Swent: But there were some in the state who didn't want it.

Joklik: Yes.

Swent: I guess I should say that a majority of the people wanted it.

Joklik: That's right. A couple of weeks after our return from Birmingham, I met with Spence Eccles and Verl Topham. The three of us decided to get our respective companies to underwrite at least a core of contributions that would enable us to bid again. We each committed to \$100,000 per year for the four years from 1991 to 1995.

### Same Team Continues; Chairman, Board of Trustees

Joklik: Tom Welch had headed our bid for the 1998 Games. He has an excellent personality for winning friends and influencing people. He's a born salesman. Tom quit his job as general counsel for Smith's Foods and spent full-time on our new bid without pay. His chief lieutenant was Dave Johnson, an outstanding young man who is very knowledgeable about the winter sports industry. He's a can-do guy for whom IOC members developed an instant liking. He, Tom, and I went to work and kept Salt Lake City in the forefront of IOC members' minds during the slow years of 1992 and 1993, when 1995 still seemed far into the future.

In October of 1991, the governor, Norm Bangerter, and the mayor, Palmer dePaulis, established a board of trustees for the Olympic Bid Committee. They appointed me chairman. Tom Welch, as president of the Bid Committee, reported to the board which set policies, budgets and strategies. Although Tom worked without compensation, the rest of the staff, about a dozen people, were salaried.

### Albertville Olympic Winter Games

Joklik: The next major event was the Albertville Olympic Winter Games, in February of 1992. A group of us, Tom, Dave, Spence Eccles, Verl Topham, Pam and I, and several others--maybe twenty people in all--went over. Most of us, of course, went at our own expense. Staff was paid for. We had a week there before the Games began, during which the IOC had their plenary session. We spent time with groups and individuals and were able to take some of them skiing. The Haute Savoie being such a large area, recreational skiing was permitted, despite the logistic requirements of preparations for the Winter Games. We enjoyed some good days there, including the tour of the Trois Vallées, namely Courchevel, Méribel, and les Ménuires. Our guide was a seasoned ski instructor named Patrick. He was greeted by one or more girlfriends in every village we visited. Patrick introduced our little group to a potent liqueur called Genepy (probably misspelled). The occasion was a pleasant lunch at a restaurant on the ski slopes. Although our skiing ability didn't seem to be impaired, Pam kept giggling.

### Grand Couloir

Joklik: One morning, as Pam and I waited to ride the tram to the top of Saulire, the mountain peak overlooking Courchevel, we were joined by one of the more important members of the IOC, Dr. Kim from South Korea and his family. As we were getting off, Dr. Kim took advantage of the photo opportunity to capture the breath-taking view, including Pam and me starting to ski down. The trail we picked rapidly became more narrow and steepened until you couldn't see below. Since Dr. Kim and his group were watching, we couldn't turn back. After all, the honor of Salt Lake City was at stake. As we continued down, we noticed little black flags, denoting slopes of extreme difficulty. You dropped several meters at each turn. We finally came to a sheer passage between two cliffs and made it to the bottom. We learned we'd come down the notorious "Grand Couloir," which earned us respect from those who thought we'd chosen to come down that way.

The Games were successful, we thought. There'd been apprehension that the venues were spread out too far, with winding, narrow, connecting roads making transportation difficult. But they had done a good job of estimating volumes of traffic and limiting access to buses and a few accredited automobiles. As we traveled from venue to venue, we didn't run into long delays. But, since the distances were considerable, it sometimes took several hours to get to a venue and back again.

Swent: You'd have comparable problems here, wouldn't you?

Joklik: Not at all. That's what sets us apart. The idea of the Olympics is to bring together athletes, officials, media personnel, and spectators. We convinced the IOC that Salt Lake could do a great job of transportation from the athletes' village to and between venues.

### Face Bellegarde

Joklik: The most memorable event at Albertville was the men's downhill at Val d'Isère. It was a beautiful day, not particularly cold, and the race was run on a new course on the Face Bellegarde. It was a somewhat technical course for a downhill. We were amazed how much of it could be seen from the finish area, where there was room for 50,000 spectators. A men's downhill has close to 1,000 meters of vertical drop. You could pick out a racer way up near the start, when he still had 80 percent of the course to run, and follow him



all the way down. They had large television screens that showed close-ups of the racer from the moment he left the gate. At the same time, you could also follow him with the naked eye and see him work his way down. Patrick Ortlieb of Austria was the first racer down the course and his time wasn't beaten.

We learned a lot from what we observed at Albertville and then attended several IOC functions. The Olympic Museum in Lausanne opened in June of 1993. It's a beautiful facility which cost \$100 million to build. You can get lost there for hours reviewing highlights of past Olympic Games.

### Sydney Beats Out Beijing for 2000

Joklik: At the September, 1993 session in Monte Carlo, the host city for the 2000 Summer Games was selected. The surprise winner was Sydney, by the slimmest of margins over Beijing--45 to 43. Sydney won by virtue of hard work. Also, they had put their money where their mouth was by going ahead with construction of the sports complex at Homebush, on Sydney's inner harbor. Beijing was claiming, "By the year 2000 we'll have it all together." The Sydney delegation responded, "Look what we've already accomplished." Sydney had strong support from environmental groups, whereas Beijing has pollution problems that weren't addressed.

In Beijing's presentation, the vice president of China said, "By 2000 we'll have the environment cleaned up. We'll have state-of-the-art facilities at all the venues. And, we'll guarantee that all athletes, coaches, officials, and spectators will be admitted into our country. Moreover, at the conclusion of the Games, they'll be allowed to leave." There was a moment of stunned silence and then raucous laughter. What a gaffe!

Swent: Excuse me--didn't you go to a meeting in Kuwait?

Joklik: Yes, to the December, 1993 meeting of the Olympic Council of Asia. Dave Johnson and I attended. I gave a presentation on Salt Lake City's bid. We were generously hosted by Sheik Ahmad El Sabah, the International Olympic Committee member for Kuwait. He succeeded his father, who was killed by the Iraqis in the Gulf War.

To my amazement, Kuwait showed hardly any scars from the Gulf War. They'd done a great job of rebuilding what had been damaged.

[Interview 7: February 23, 1994] ##

Swent: Tell me about the Lillehammer Olympics, February 1994.

#### Lillehammer Olympic Winter Games

Joklik: Yes. Pam and I were there with a delegation of forty from Salt Lake City. We arrived one week before the Games began, to lobby IOC members ahead of the Games. We rented a farmhouse, in which we established a restaurant, using the same people who helped us in Birmingham. The farmhouse was built in 1720 and remained in the same family for fifteen generations, including the present owners.

Swent: You must have made some preliminary trips over there, then.

Joklik: Dave Johnson made preparations and was generously helped by Peter Rønningen, the Operations Manager of the Lillehammer Games.

Lillehammer is a town of 25,000, three hours' drive north of Oslo. When we arrived there, it was bitterly cold and stayed that way throughout our visit. The town is just a few hundred feet above sea level. Humidity makes the cold penetrating and it's difficult to keep warm. It reminded me of winters in Québec City.

#### King Harald Visits

Joklik: During the first week, we had fifty-five IOC members to lunch or dinner at our farmhouse. We had the honor of a visit by King Harald who spent an hour with us. He's an affable, athletic man. I presented him with a Browning 30-30 rifle. We were also visited by Prince Albert of Monaco. Sheik Ahmad came to see us because of the friendship we had formed in Kuwait. Prince de Mérode of Belgium came. We had an interesting luncheon with Mr. Mzali, the former prime minister of Tunisia. He told a harrowing tale of his escape to Algeria and France when his administration was overthrown.

The opening ceremonies at Lillehammer were spectacular, with emphasis on folk dancing, folk music and the tradition of trolls, which gave free rein to the imagination--all kinds of cute and weird creatures performed acrobatic acts on and off skis. We all

were given white ponchos to put over our clothes, so that the cameras panning the audience showed a sea of white which matched the snowy landscape.

The Olympic flame was lit not, as in Barcelona, by a man firing a blazing arrow, but by a skier who came off a jump in the dark carrying the torch, landed by some steps and bounded up to light the flame. About four days before the games, Peter Rönningen who, in all the hustle and bustle of preparations for the Olympics maintained an air of resolute calm and good humor, happened to be visiting us at our house, when he received a call from the jump site. The athlete who was designated to carry the torch had already done fifty practice jumps on preceding days and just then, on the fifty-first, crashed and had to be taken to hospital. They had to quickly find and train a substitute to perform at the opening.

Over the next few days, we attended some of the sporting events. Although the clouds cleared and the sun came out, the temperature dropped another ten or fifteen degrees.

Swent: Of course, it got dark very early.

Joklik: Yes, but not as early as I'd thought. On sunny days, it got dark at five o'clock. We had about eight hours of daylight.

#### Tommy Moe Wins Gold

Joklik: We went to see the Men's Downhill at Kvitfjell, about sixty kilometers north of Lillehammer. And our own Tommy Moe won the gold. Since he'd been ranked eighth, he wasn't quite the outsider the media made him out to be. His win still gave us plenty of cause to cheer.

We set up a meeting including Marc Hodler, the senior Swiss IOC member and president of the International Ski Federation, and Bernard Russi, the Swiss Olympic gold medal winner and recognized world expert in downhill course design. The purpose of the meeting was to introduce them to one of our most important supporters, Earl Holding, who owns Little America Hotels, Sinclair Oil, as well as several ski resorts, including Sun Valley. The downhill course for the 2002 Olympics will be at Snow Basin, a resort about thirty-five miles north of Salt Lake City. Earl, as owner of the resort, is key to this project. Earl, Marc Hodler and Russi agreed that Russi would design our downhill course.

The sports venues at Lillehammer were spectacular. The inverted Viking ship, in which the speed skating events were held, has a roof supported by wooden beams with an incredible span. It's beautifully done. We were in the VIP seats at a speed-skating event for which our daughter, Katie, had arrived early. Her seat was way at the back and, as competition began, an attendant ushered her to an empty rink-side seat. She found herself next to a fair-haired young man who struck up a conversation. When she asked him whether he skated, he nodded. Had he skated in the arena? Again he nodded. When? Yesterday. It turned out to be Olaf Kos who had broken two world records on preceding days, and was set for his third. I later met him in Budapest. His modesty enhances his appeal as an idol for the kids' programs he promotes.

The Olympics have become huge media events. Between CBS and the Japanese, European and Australian networks, half a billion dollars was paid for television rights at Lillehammer.

#### Norwegian Sportsmanship

Joklik: Whilst the Norwegian spectators cheered most loudly for their own athletes, they also vigorously applauded competitors from other nations. They demonstrated superb sportsmanship. On the plane over to Oslo, a television commentator said to me, perhaps a little harshly, "The Games are a sublimation of man's aggressive instincts." That's only part of the truth. They provide an outlet for man's desire to compete, in an environment where sportsmanship is prized.

Two events dampened the jubilant atmosphere at Lillehammer. First was the accidental death of Ulrike Maier of Austria, just a couple of weeks before the Olympics. She had been World Super G champion for a couple of years, the only mother in the World Cup circuit, a very popular girl. Her death was remembered and alluded to frequently. The second damper was the tenth anniversary of Sarajevo. The 1984 Games did not leave a legacy of brotherhood and peace.

[The following section was dictated in early 1996]

Joklik: The Lillehammer Olympics, nevertheless, concluded in an aura of success. At the closing ceremonies, President Samaranch characterized them as the best Olympic Winter Games ever. Such accolades were given, despite difficulties with access and transportation, the frigid cold weather, and the limited

facilities for entertainment and relaxation in a little town of 26,000 people. But, in terms of the sports venues, perceived care for the environment, and hospitality and sportsmanship of the population, Lillehammer received deservedly high marks. With just sixteen months to go before the selection of the host city for the 2002 games, Lillehammer set a standard for future bidding cities to emulate.

### Ten Cities Bid for 2002

Joklik: In the aftermath of Salt Lake City's narrow defeat in Birmingham, many commentators declared that the best candidate city had lost. We were expected to run again and win. But, as time went on, others thought they could detect chinks in our armor and, one by one, submitted their candidacy. Östersund, who had bid several times previously and presented a strong bid in Birmingham, initially stated they would skip 2002 and not bid again until 2006. But, under new management, they changed their minds and surprised us by presenting a bid for 2002 after all. It was hard to believe that, by the time the Lillehammer games came around, we had nine rivals in a field of ten. Those bidding were:

Almaty, Kazhakstan  
 Graz, Austria  
 Jaca, Spain  
 Östersund, Sweden  
 Québec, Canada  
 Poprad-Tatry, Czechoslovakia  
 Sion, Switzerland  
 Sochi, Russia  
 Tarvisio, a joint bid of Slovenia, Austria and Italy  
 Salt Lake City, USA

This was the largest ever field of candidates for an Olympic Games, motivated, at least partly, by the escalating value of international television rights and the consequent expectation of financial gain. The IOC leadership was faced with devising a selection process for picking one host city from such an unwieldy array of candidates. Should all ninety-plus members of the IOC be encouraged to visit all ten candidate cities to gather sufficient data for their individual votes?

At the conclusion of the IOC's plenary session in Lillehammer, a process was announced. The representatives of the ten candidate cities were summoned to IOC headquarters in Lausanne on March 24, 1994, where we were presented with "A Manual For



Cities Bidding To Host The XIX Olympic Winter Games--2002." The manual required:

- Submission of a bid file containing detailed answers to a questionnaire with twenty-three themes, by August 15.
- A guarantee of \$100,000 at the time of submitting the file to be returned with interest to the cities whose bids failed.
- A visit by an IOC Site Evaluation Commission.
- A presentation to the IOC Executive Board, in January 1995, by a small delegation from each candidate city.

The executive board would then select four finalists who would be open to visits by IOC members, prior to the final presentation in Budapest on June 16. We had our time cut out.

#### Skiing with Bernard Russi

Joklik: One of the first matters we had to attend to was finalizing the location for our Downhill and Super-G courses. Park City and Deer Valley were obvious choices for the Giant Slalom and Slalom events, but since the decision was made, for environmental reasons, to exclude Olympic events from Big and Little Cottonwood Canyons, another site suitable for the Alpine speed events had to be nailed down without delay.

As I have mentioned, when they met in Lillehammer, Earl Holding agreed with Marc Hodler, that the Swiss Olympic Gold Medal downhill Champion, Benard Russi, should design a course for us at Snow Basin. Russi, therefore, paid us a visit in March 1994. Earl, Dave Johnson, Rainer Kolb, and I picked him up in Earl's G-3 at Vail and took him by helicopter from Salt Lake to Snow Basin. We rode up as high as we could on snow cats and then climbed to the top of Mount Allen, carrying our skis. The snow was thick but crusty. Fortunately, I had borrowed a pair of Atomic Fat Boys which enabled me to stay on top of the crust. I noticed my companions followed my example. We skied down the proposed course alignment through the trees and alders. I was awed by the ease with which Russi handled the steepest parts of the course. He made substantial changes to the proposed layout. That evening, Pam gave a dinner party for him at our house. That was a day I'll long remember.

The development of Snow Basin as a venue for the signature Olympics alpine skiing events has depended on a land exchange between Earl Holding and the U.S. Forest Service. As the

bureaucratic process mandated by the EPA dragged on, time for completing the required facilities became short. Legislation was therefore introduced in Congress to accelerate the process. After much politicking, the legislation was finally passed, in the House and the Senate, in September 1996. My experience with lobbying, in the 1980s, and lasting friendships with some key congressmen and senators proved to be helpful in smoothing passage of the land exchange legislation.

### Some Close Calls

Joklik: There were other adventures, some serious, some not so serious, which enlivened the road to Budapest.

On one occasion, we took representatives from the International Ice Skating Federation on a rafting trip down Cataract Canyon on the Colorado River. Before boarding, we took them to see some petroglyphs in the Navajo Sandstone cliffs which border the river near Moab. We suggested they look in a rock cleft, at the base of a cliff, for fallen fragments of artifacts. To their amazement, they found a couple of rock tablets on which were etched stick figures that looked like skiers and the inscription "Salt Lake City 2002!"

Earlier, at a USOC dinner in New York, I was going to present President Samaranch with a Browning shotgun since he is fond of hunting. The gun was in a beautiful leather case with a small engraved brass plaque. During the afternoon, Tom Welch and I were admiring this gift in my hotel room when I noticed Mr. Samaranch's first name, Juan, had been misspelled "Jaun." We controlled our mild panic and began phoning around for an engraver who might help us out. Finally, Tom jumped in a cab which took him to Tiffany's. When he explained our predicament, they took him to their workshop and, an hour later, the leather gun case had a new plaque on it. Pam and I, meanwhile, kept President Samaranch busy at the reception in his honor. He must have wondered at the relief with which I presented the gun to him.

Our bid documents were bound in three volumes which had to be submitted by the deadline of August 12, 1994. On August 10, Tom brought a copy to my office for a final look before dispatch to Lausanne. As I was glancing at the cover of Volume Two, on which the title was printed in both French and English, I noticed that Volume Deux was misspelled "Volume Duex." From my experiences in France and Québec, I was well aware how the French detest anyone butchering their precious language. When I pointed

this out to Tom, I thought I'd have to take him to the hospital. To ensure arrival in Lausanne and distribution prior to the deadline, the courier had to pick the documents up that evening. The printer at first swore he couldn't make the changes in time, but when we held his feet to the fire, he found a way of doing it. Another sigh of relief!

In September, 1994, the IOC held a congress in Paris, celebrating the centenary of the founding of the modern Olympics in 1894 by Baron Pierre de Coubertin. We attended the sessions in the La Defense Convention Center during the day and entertained our IOC guests at dinner in an ornate room at the Hotel Plaza Athenée. The U.S. Embassy was very helpful. Ambassador Pamela Harriman gave a cocktail party at her residence. Embassy officials assisted us with visas for IOC members who intended to visit Salt Lake City in the winter of '94-'95. To facilitate this process, we would pick up their passport, take it to the U.S. Consulate and return it to them, complete with visa. We wanted to do this, among others, for one of the most senior IOC members, Alexandru Siperco, of Rumania. Dave Johnson, who is one of the most reliable people I know, picked up Mr. Siperco's diplomatic passport at his hotel, put it with some papers he was carrying, walked across Place Vendome and headed for the consulate. When he arrived there, he found, to his horror, that the passport was missing! A diplomatic passport, we were told, commanded a high price on the black market. Dave looked paler day by day. Mr. Siperco was beside himself.

Early one morning, our friend François Carrard, the IOC Director General, who was nearly always affable, came to our hospitality suite to tell me that President Samaranch trusted we would quickly find the passport. I replied we had alerted the police, embassies, hotels, and anyone else we could think of; François cut me short, pushed his handsome face within inches of mine and shouted, "Frank, find it now!" Visions of an aborted bid came to mind. Tom Welch and I had conversations in which we reviewed options such as a desperate mission to Bucharest, abandonment of our bid, or suicide.

On the fourth day, early in the morning, Dave called me with unexpectedly good news. A pedestrian had picked up the passport, turned it over to the police who had taken it to the Rumanian Embassy who, in turn, had already been contacted by the U.S. Embassy and forwarded it to them. This remarkable chain of actions by people of honesty and goodwill extricated us from a potentially catastrophic situation.

### Impressing the Site Evaluation Commission

Joklik: The visit by the Site Evaluation Commission, as prescribed by the IOC's selection process, took place in September, 1994. The commission included five IOC members, representatives from the pertinent international sports federations, members of the Lillehammer Organizing Committee and IOC staff. They were led by Thomas Bach, IOC member from Germany. As they arrived at the Salt Lake Airport, on September 18, we welcomed them with dances by a troupe of Native Americans, most of whom were students at Brigham Young University. Our visitors were flabbergasted when the leaders of the troupe thanked them for coming in fluent French or Spanish, as appropriate, as well as English.

The following morning, we gave members of the commission a formal presentation at the Delta Center (a brand new ice hockey and basketball arena that seats 21,000). We then took them on a tour of the Salt Palace Convention Center which is being rebuilt and will provide 30,000 square meters of space for the Media and Broadcast Centers during the Olympics, Symphony Hall, where the IOC's opening session will take place, and the future Athletes' Village at the University of Utah.

On September 20, we had a fleet of seven helicopters take them to Snow Basin. The magnificent mountains there displayed fall colors of oaks and aspens at their best. Earl Holding gave an inspired presentation. We then flew them to the Winter Sports Park at Kimball Junction, where they saw the recently completed ski jumps, the bobsled and luge course under construction and a free-style jumping exhibition utilizing the new aerated splashpool. They also saw the Giant Slalom and Slalom courses at Park City and Deer Valley and the Cross Country and Biathlon facilities in Mountain Dell.

The commission members were clearly impressed by the proximity of all venues to the Athletes' Village, the ease of access to them, mostly by four-lane highways, the modern infrastructure of Salt Lake City; in short, our state of readiness to host the Winter Olympics. We put our best foot forward in the culinary department, including a luncheon on the patio by the pool at our home.

Our guests departed from the airport, serenaded by childrens' choirs and, no doubt, overwhelmed by our desire to impress.

The commission produced a report on their visits to the ten candidate cities which was published in December 1994. It



consisted of a tabulation of facts gathered and a summary of conclusions and recommendations for each city. All of this was compressed into a bound volume of 190 pages. The report was professionally impressive. Admittedly, the section on Salt Lake City made good reading.

### Santa Claus on Our Side

Joklik: The publication of the report coincided with a meeting in Atlanta of the Association of National Olympic Committees. Since many National Olympic Committees are headed by an IOC member, about thirty-five of the total of ninety-five IOC members attended the Atlanta meeting. The Marriott Marquis was the convention hotel. We entertained our IOC friends at the Capital City Club. Almaty had abandoned their bid, but all the other candidate cities were represented at the meeting. Presentations were given by the bid cities. With city after city extolling its virtues, the delegates' concentration wasn't all it could be. After I spoke, and then Dr. Leroy Walker, the president of the USOC, Deedee Corradini, our mayor and then Tom Welch, suddenly Santa Claus came bounding in the door of the convention hall with resonant "Ho, Ho Ho's," leaped up on the podium, grabbed the microphone, wished everyone a "Merry Christmas" and lauded the Salt Lake bid. The guise of Santa was worn by Rod Hamson, our chief accountant. The delegates were delighted. I'm sure that for many of them, this was their only recollection, after nine presentations.

The Graz delegation was led by our good friend, the Austrian IOC member, Phillip von Schöller. I talked several times with an athletic-looking middle-aged member of the delegation before realizing it was Tony Sailer, the first man to win all three Olympic gold medals in alpine events. That was at Cortina d'Ampezzo, in 1956.

Our contacts with IOC members in Atlanta struck me as a turning point in our bid. Whereas, at previous gatherings, we had patiently waited in hotel lobbies to ambush members as they scurried from one appointment to another, in Atlanta many of those attending sought out Tom, Dave, or myself. I sensed they genuinely wished us well. When we came to adding up our "sure bets, probables and possibles," as we frequently did, we concluded, for the first time, that we had a good chance of winning in Budapest.



### The Final Four

Joklik: Selection of the final four took place on January 24th and 25th. For the IOC Executive Board meeting in Lausanne, we and the other candidate city representatives stayed at the Palace Hotel, where the IOC members also were quartered. On the morning of January 23rd, we drove to IOC headquarters at Château Vidy. Our presentation started at eleven o'clock, after Sion, Jaca, and Poprad-Tatry. Our senior IOC member, Anita de Frantz, introduced me. I spoke, followed by Dr. Walker, DeeDee Corradini, Dave, and Tom. We showed a five minute video and answered questions from Dr. Un-Yong Kim of South Korea, the Duke of Luxembourg, and Judge Keba Mbaye, of Senegal. I then chaired a press conference, at which I answered one question regarding Salt Lake's drinking laws by saying if you couldn't find a drink in Salt Lake, you couldn't be very thirsty! The press at last had something worth printing.

Late in the afternoon the following day, the delegates gathered to hear President Samaranch announce the results of the selection process. The survivors turned out to be Sion, Östersund, Québec, and Salt Lake City. Our reaction was one of relief, although there was no one at home or abroad who expected us not to make the cut.

I should mention a couple of other events that took place towards the end of 1994. One was the Olympic Council of Asia meeting in Hiroshima. About a dozen IOC members were present, with many of whom we were on good terms. I gave a short presentation on our bid. My thoughts turned to the aftermath of the A-bomb. Utter destruction has been well documented in a museum at the site. I encountered no trace of resentment. I was surprised by the beauty of the surroundings of this newly built city. On my last day there, I took a ferry to Miyajima Island, the site of the Itsukushima Shrine. I befriended a young Japanese engineer who spoke a few words of English and walked around with me as we took pictures and absorbed the autumn sunshine. But the events of fifty years before cast a shadow.

Another sortie took me to Abu Dhabi, where I had hoped to meet Prince Faisal of Saudi Arabia, through the good offices of Sheikh Ahmad, our friend from Kuwait. The occasion was the Gulf Soccer Cup which is held every two years and fiercely contested among the nations around the Persian Gulf. To my regret, Prince Faisal had, at the last minute, cancelled his plans to attend, in order to fly his ailing mother to the U.S. for treatment. It wasn't a total loss since I had a good meeting with Sheikh Ahmad and attended the first game of the Gulf Cup, complete with honor guard and an opening ceremony featuring camel brigades,

magnificent horses, sword-wielding Bedouins and troupes of robed women with long, dark hair.

The lengthy bid process which led to the selection of four finalists at Lausanne in January 1994 could be likened to an endurance race. The period remaining from January to the June IOC session in Budapest was a sprint, or the final push to the summit, or our final chance in an endeavor that began thirty years before.

Each of the finalists reacted differently. Sion had entered the field late, but appeared to be gathering strength with each passing day. The Swedes continued running a low-key campaign characterized by perseverance and the message, "You owe us one," because of their long history of previous bids.

The Québec people were visible everywhere, loud and, in contrast to the other three bid cities, vocal in their denunciation of the competition; in political terms, they ran a "dirty" campaign.

#### Countering the Gainsayers

Joklik: Meanwhile, back at home, the atmosphere wasn't all sweetness and light! Several individuals who called themselves "Utahns for responsible public spending" disseminated misinformation, arousing fears of excessive growth, damage to the environment and financial deficits. We were surprised when Jon Huntsman, a respected industrialist in Salt Lake City, voiced doubts about the validity of our budget for the games.

We did our best to counter these arguments. I gave a talk to the Salt Lake Rotary Club with the theme, "Our Olympic Bid; Just The Facts, Ma'am." I said that the revenues in our \$790 million budget had been conservatively estimated and that the matching expenditures contained adequate allowances for contingencies. In the U.S., the concepts of private sponsorship and management of Olympic Games are well established. Our model for the Winter Olympics follows the same pattern and does not involve recourse to public funds. The \$59 million of sales tax dollars used for the construction of the Winter Sports Park and the speed skating oval will be repaid to tax payers from Olympic revenues. I also said that any growth attributable to the Olympics would be minor, compared to actual growth resulting from the current economic boom in our area; and that experience at Calgary, Albertville, and Lillehammer does not support the notion that Olympic Winter Games cause unbridled growth. Finally, I told

the audience that my support of the Olympics was not driven by prospects of economic growth or financial gain by our community. Instead, I foresaw inspiration for our youth and upgrading of our quality of life.

When I was appointed chairman of the board of trustees by Governor Bangerter, he emphasized the need for fiscal responsibility. Our bid budget for the 1998 games was \$6 million. We estimated the cost of our four-year campaign for 2002 at \$7 million. This time around, I found fund raising more difficult, partly because my retirement from Kennecott, in 1993, reduced my list of potential donors. Most of the companies and individuals we had come to rely on continued to be generous. But a number of prominent Utah-based corporations, who had done well from the technology and consumer boom, declined to contribute.

#### Wooing the IOC

Joklik: The final six months of our bid consisted of intense, enthusiastic wooing of individual IOC members. We were aware that the duties and motives of IOC members were not publicly well understood. Reports of dinners and travels to remote places were frequently represented in the press as "boondoggles." The fact that IOC members were treated with respect led to comparisons with "royalty" (of course, some of the European members are royalty). Invitations to membership of the IOC are based on performance, interest in and support of amateur sport. In recent years, the dividing line between amateur and professional sports has become blurred. Nearly all IOC members are well educated and have intellectual interests that extend beyond sports. The IOC ties sportsmanship to culture and care for the environment. IOC members serve without compensation, yet are expected to devote about half of their time to duties connected with the Olympic movement. Some find it difficult to make ends meet under such circumstances, which occasionally leads to speculation about bribery and corruption. The IOC has strict rules against acceptance of expensive gifts or favors, and I haven't seen any conclusive evidence of such rules being broken.

The U.S. is fortunate in having two outstanding individuals as IOC members. Anita de Frantz, despite her youth, commands wide respect among her colleagues. She is bright, articulate and independent. Her support was vital to our campaigns. Jim Easton became an IOC member in 1994 and has already established himself as a responsible contributor. He sacrificed much time from his business to join us in hosting his colleagues.

It's difficult to single out individual IOC members. Marc Hodler, from Switzerland is "Mr. Winter Sports" in the Olympic movement. Apart from his leadership of the International Ski Federation, he has served on the executive board and virtually every financial, legal and political commission organized by the IOC. Despite his advanced years, he has made a point of attending and presiding over each of our World Cup openings. He's accustomed to standing out in the cold watching the races, usually bareheaded. After our loss in Birmingham, he was the first to say, publicly, that the city with the best bid had lost. We are delighted that he now is chairing the IOC Coordination Commission overseeing the 2002 Olympic Winter Games.

When Sydney won over Beijing by 45 votes to 43, we cheered, not only because I grew up in Sydney, but also because we had become good friends with the Australian bid team headed up by IOC members Kevan Gosper and Phil Coles. Both men were outstanding athletes in their youth--Kevan, an Olympic medalist in track and field, and Phil, an Olympic competitor in canoe and captain of the Australian Surf Lifeguard team. Our friendship with the Australians came about naturally, and they were very supportive of our bid. We look forward to the Summer Olympics in Sydney, two years ahead of the 2002 Winter Olympics.

The protocol established by the IOC at Lillehammer provided that visits to the four finalist bid cities should take place in groups, with the objective of lessening financial and logistic burdens on the bid city organizing committees. From January to May, 1995, we had more than fifty IOC members visit Salt Lake City. About half came in the periods designated for group visits; the rest arrived individually.

#### A Pre-emptive Strike

Joklik: The largest group of visitors came early in April. Most of them were due to come via Québec city. We hit on the idea of a minor pre-emptive strike by asking Earl Holding and Ron Skaggs for their Gulf Stream airplanes and picking up our guests in Québec. Tom and I flew up the night before. The temperature, -17°C, brought back vivid memories of my winters in Québec in the 1950s. We were at the terminal bright and early when limousines arrived with IOC members and leaders of the Québec bid committee, the latter looking a little crestfallen! It seemed like a prisoner of war exchange except, with our luxury planes waiting, we had the advantage. We loaded the Arroyos from Ecuador, the Cernusaks from Slovakia, the von Schöllers, the Holst Sorensens from Denmark, the



Bridges from Jamaica, Robin Mitchell from Jamaica, and Craig Reedy from Scotland. The flight to Salt Lake was comfortable in the well-provisioned aircraft, and avoided a couple of plane changes our guests would have had to endure had they come commercially.

At the Salt Lake airport, an enthusiastic crowd of high school students gave an impromptu (well-organized) welcome. That evening, Pam hosted a dinner for the visitors and prominent Salt Lakers at our home. By then, General Gadir from Sudan and the Vallerinos from Uruguay, had joined the group. They all enjoyed an excellent dinner catered by Gastronomy (Tom Sieg and Tom Guinea's firm which had staffed our hospitality houses in Birmingham and Lillehammer). From our home, they enjoyed a view of the mountains and the twinkling lights of the city.

The following day, we gave them a formal presentation and took them on a tour of the city. For Sunday, we'd planned a trip to Lake Powell. The weather in Salt Lake was abysmal and the reports from Page weren't much better, but we had lined up the Gulf Streams, as well as the governor's King Air, and decided to go ahead with the trip. It was cold and windy when we boarded our tour boat at Wahweep, but the weather improved as we got underway. The trip to Rainbow Bridge took a couple of hours. Since the tourist season hadn't really begun, we were able to enjoy the beauty of this national monument undisturbed. Navajo Mountain, in the background, had plenty of fresh snow on it. Before flying back to Salt Lake, we entertained our guests at dinner in the Wahweep Hotel. Native American dancers performed and Mother Nature turned on a breathtaking sunset, with cloud formations and stunning colors.

On Monday morning, a fleet of helicopters took the group to Snow Basin. We had twenty-five snowmobiles ready to take us up to the start of the Ladies' Downhill. Although snow cats had groomed a trail through the heavy snow, we hadn't fully taken into account that most of our IOC guests hadn't ridden a snowmobile before. We set off with a roar, most of us single and some with pillion riders, and didn't experience any problems until higher up in the mountain, where the slopes became steep and the trail canted downhill. I came around a corner to see General Gadir standing, covered in snow. He'd had the good sense to leap off his machine as it slid off the trail down a steep incline. Phyllis Easton, Jim's wife, turned sideways on a steep incline and tumbled, with the machine cat-wheeling over her. Fortunately, she was uninjured and made nothing of her mishap. We made it down the mountain ahead of an approaching storm and left our visitors with vivid memories of their experience.



I've related this group's visit as an example. Not all our snowmobiling excursions were as hazardous. We took several groups to Lloyd and Barbara Hansen's cabin in Weber Canyon, where our guests could try their skills in more forgiving, yet still magnificent terrain.

Pam and I took several visitors skiing at Deer Valley and Snowbird. Occasionally, we still managed to get away for skiing, just the two of us. We spent one afternoon at the Winter Sports Park and, after a little coaching by Jeff Volmrich, tried our skill off the eighteen-meter training jump. Our form may have left something to be desired, but the thrill was undiminished.

In answer to our prayers, the winter of '94-'95 brought near-record snow falls. Most of the resorts closed in the spring, still with plenty of base left. Snowbird was open until July 4, with 1,500 skiers on the slopes. This ideal climate for winter sports, with relatively mild temperatures and excellent snow conditions, was not lost on our visitors.

We took five more groups on excursions to Lake Powell, from which they gained an impression of the variety of Utah's natural wonders. In not much more than an hour, we would transport them from mid-winter scenery in the mountains around Salt Lake to balmy breezes on the lake with a background of towering red sandstone cliffs and canyons.

#### Entertaining at Home

Joklik: We made sure our guests met not only bid committee members, but also prominent Utah business, political and social leaders. Pam gave twelve dinner parties in our home. One of the last, towards the end of May, was in honor of Valeriy Borzov, recently appointed IOC member and minister for culture from the Ukraine. Borzov is best known as the winner of the 100-meter and 200-meter Olympic Gold Medals at the 1972 Summer Games in Munich. He is still a strapping, confident man, with a quiet sense of humor. We were used to presenting our dinner guests with Utah memorabilia, such as native American art or inscribed books. In the course of dinner, my mind wandered to an occasion, a few weeks previously, when a friend of mine from Washington, D.C., had given me a book published in 1979, on the history of the Olympic Games. I wondered whether, by chance, that book might contain a photograph of Borzov. I excused myself, found the book in my study and looked up Borzov in the index. To my delight, there was a magnificent picture of Borzov crossing the finish line of the 100

meters. Our dinner guests passed the book around and, when I saw how delighted Borzov was, I didn't have the heart to ask for it back, but presented it to him. He maintained he had never before seen that particular photograph and appeared touched by our attempt to please him.

Other friends of ours also extended hospitality. Vince Donile has a spectacular home on a hill top in Park City, with a gun collection and a wine cellar, both of which must rank among the most exceptional in the country. He gave a couple of dinner parties from which our visitors took with them samples from his cellars.

The Utah Jazz won most of their NBA games to which we took IOC visitors in the Delta Center. We were amazed to find in how many countries NBA competition is closely followed and the names of individual players are familiar.

Among all of this frenetic activity, family happenings included Paul's graduation from Georgetown Law School and Katie's engagement to an outstanding young man from the east coast. The wedding took place on September 16, three months after the IOC meeting in Budapest. Pam worked wonders towards the celebration of these events.

### The Journey to Budapest

Joklik: With the last of overseas visitors coming to Salt Lake, we prepared for the journey to Budapest. We took advantage of a final series of contacts with IOC members from Asia by attending an Olympic Council of Asia session in Seoul. The IOC members to whom we spoke individually were supportive, but warned us against over-confidence and relaxation of our efforts. I hadn't been to Seoul before and was impressed by what had been accomplished there in the past thirty years. This was exemplified by the announcement that Hyundai was planning to invest \$1.3 billion in a semiconductor plant sited in Oregon, where relatively cheap, skilled labor was available. The proximity of Seoul to Pan Mun Jon, however, gives food for thought.

The journey to Budapest began on June 6th. Tom, Dave, and I visited several IOC members on the way over there. Dave and I flew to Madrid, where the U.S. ambassador, Richard Gardner, gave a dinner party for Carlos Ferrer, Spain's IOC member, and Princess Nora, of Liechtenstein. We had met both on previous occasions,

but weren't sure of their inclinations. We thought we made good progress that evening.

I flew on to Warsaw to meet with Mr. Wlodzimierz Reszek, one of the most senior IOC members. He had previously expressed apprehension about the "socially restricted" lifestyle of Salt Lake City. He'd heard about the liquor laws and the limited night life, interesting concerns for a man of eighty-three! I tried to disabuse him of his prejudice, and presented him with a bottle of Cognac. He mellowed. By the end of our meeting, we had agreed that he would support Salt Lake City if we would help the Polish NOC (National Olympic Committee) with their candidacy of Cracow for the 2006 Winter Olympics.

I met up with Pam in Frankfurt, where we had dinner with our good friends, Walther and Almuth Tröger. Walther is the senior German IOC member. He, as other Europeans, may have had difficulty choosing between European and North American bid cities. After visiting Salt Lake City, most of them appeared to recognize the advantages we had to offer.

In Budapest, six accredited persons from each bid city stayed at the Marriott Hotel, overlooking the Danube. This hotel served as the IOC headquarters. Pam and her friend, Tina Lewis, had organized a delegation of 380 supporters from Salt Lake. Some stayed at the Kempinski, and most were quartered at the Hilton Hotel, across the river on the Buda side. The delegation spent several days in Vienna, prior to their arrival in Budapest. Pam had to go there on a brief trip by car, to host a cocktail party for members of the delegation and leaders of the Viennese business community. Meanwhile, Tom, Dave, and I had begun a final round of lobbying with IOC members who'd arrived early in Budapest. We had to be careful not to appear pushy at this late stage. On the other hand, we couldn't take anything for granted. Wherever we went, we saw representatives from other bid cities scurrying around. Fresh rumors circulated every day. Sion was reputedly making headway with European IOC members, who numbered roughly half of the total. An "ambassador" for the Québec committee had reportedly visited each IOC member in his country within the past three months, bearing gifts. The Swedes appeared quietly confident. We counted our votes time and again with varying results, ranging from a win on the second ballot to an ignominious loss on the first. We were constantly badgered by the press with questions about our supposed role as front runner.

### Eleventh-Hour Efforts

Joklik: We'd had difficulties with preparations for our final presentation. At a time when we knew that our competitors had theirs all done, we were still talking about themes, psychology and batting order. The preparation of a video had been left to Bonneville International, who were doing it on a "pro bono" basis, but had contracted out most of the work. The contractors were technically competent, but lacked direction. We finally decided that the forty-minute presentation would begin with Anita introducing me; the following speakers would be Governor Leavitt, Mayor Corradini, Dr. Leroy Walker, Dave and Tom. The presentation included video segments by Picabo Street, our Olympic silver medalist at Lillehammer and reigning World Cup downhill champion, and a cute eleven-year old figure skater from Salt Lake, Cynthia Ruiz. The format was to include both live and video pieces by each speaker and would end with a four-minute video accompanied by music. We'd had a rehearsal before leaving Salt Lake which indicated there was work left to do.

A couple of days after our arrival in Budapest, each city was given the opportunity of a "dry run" in the auditorium of the convention center. We found the acoustics so bad that neither our live nor video pieces were intelligible in certain parts of the hall. Rod Blanchard and Ed Payne made a dash by taxi to Vienna, where equipment was available for splitting the video and audio tracks, permitting their independent manipulation. After that, we had to hope for the best.

On the nights of June 12th and 13th, we gave dinners at Gundel's Restaurant, each for about ten IOC members. We invited the whole Salt Lake delegation to the second dinner, which provided a wonderful outlet for their enthusiasm.

The IOC session was officially opened on June 14th at the beautiful Budapest Opera House, after which Pam and I joined a black-tie evening for our delegation at the Ethnographic Museum. That is a prosaic name for one of many magnificent buildings dating from the hey-day of the Austro-Hungarian empire.

The day before the vote, on June 15th, the Hungarian government gave a reception at the National Gallery. Pam took the opportunity of befriending Princess Anne who is notoriously elusive at such functions. It turned out that Pam was familiar with a charitable cause the princess espouses in Britain. Our friend, Senator Orrin Hatch, decided to take time off from pressing congressional business to join us. He had flown overnight, arrived in the afternoon, already kept some



appointments at the U.S. Embassy and joined us at the reception. I introduced him to about thirty IOC members, which was important because we had decided against inviting Vice President Al Gore or Hillary Clinton, for fear that such high profile federal government support might backfire. Senator Hatch provided the right combination of federal government representation with his Utah origins.

#### Nine in the Morning, June 16, on the Elizabeth Bridge

Joklik: June 16th finally did arrive! At nine a.m., we were driven from the Marriott Hotel to the Convention Center via the Elizabeth Bridge. After discussion of several alternatives, we'd decided to have the members of our delegation, all dressed in western gear, line one side of the bridge, so as to make the first impression of the day on the IOC members traveling the same route. Driving across, I high-fived or shook hands with almost all our people, including Katie and Paul, who had arrived a couple of days before. There was a period of nervous waiting at the convention center. I saw the look in Picabo Street's grey-green eyes and asked whether she felt the same kind of aggressive unease at the start of a World Cup downhill, and she nodded. Cynthia Ruiz just kept grinning.

We were called in at eleven a.m., after Sion. At President Samaranch's invitation, Anita introduced me. I went to the podium, talked for a few minutes about our motivation, our state of readiness and care for the environment. This was illustrated by a short video Rod Blanchard shot of me at Snowbird. The point being that this ideal site for alpine competition had been excluded from our consideration for environmental reasons. The other speakers did well and the final video brought sustained applause.

We joined our delegation for lunch in the hills outside Budapest. They had watched everything on T.V. and gave us favorable feedback. A press conference followed, which helped to fill in time.

#### Pandemonium

Joklik: At five p.m., we returned to the Convention Center, where we were seated in the front row. Most members of our delegation were also



admitted. A prelude consisted of excerpts from candidate cities' videos. After an hour, all the IOC members came on stage, President Samaranch received an envelope from the scrutineers, opened it and said, "And the winning city is Salt . . . ." At that, pandemonium broke out. Pam and I hugged each other. Picabo, who was sitting behind us, had warned us she'd jump on the table if we won. She did so, dragging Cynthia up with her, whereupon the table collapsed, which wasn't even noticed in the general confusion. I was worried Cynthia had been hurt, but she just kept grinning.

The outcome of the vote was unbelievable. Salt Lake City 54, Östersund and Sion 14 each, and Québec just 7. An unprecedented margin on an unprecedented first ballot. During the next hour, congratulations, well wishes, embraces and kisses flowed freely. I remarked that right there and then, I had kissed and been kissed by more men than in the rest of my life put together!

We gave a series of press conferences and a celebration cocktail party at the Marriott. We were summoned to President Samaranch's suite for his congratulations and a brief discussion of our future course of action. President Clinton and President Hinckley, of the L.D.S. Church, telephoned to congratulate us. Following the reception at the Marriott, we gave a party at Gundel's Restaurant which was attended by our delegation and most IOC members. We gave a final press interview at two a.m. and staggered to bed shortly before dawn.

On the morning of the 17th, there was a breakfast for our delegation at the Hilton Hotel where we were able to at last savor and talk about our victory. We flew back to Salt Lake City on a specially chartered Delta MD11. On landing, we were greeted by a shower from fire engines as we taxied across the tarmac. A cavalcade of limousines took us to the City and County Building where, the day before, a crowd of 60,000 had listened in hushed silence to President Samaranch's announcement and erupted in cheers which we heard all the way to Budapest!

As we mounted the stage, a thunderstorm drenched everybody present and was, as I told them, Heaven's approval of our victory.

Pam and I went home later that evening and talked quietly. We agreed it had been a wonderful privilege to participate in this quest of a lifetime.

### Transition from Bid to Organizing Committee

Joklik: In accordance with its bylaws, the bid committee became the Salt Lake Organizing Committee ("SLOC"). During the first few months after Budapest, there was some uncertainty concerning leadership. Most observers agreed that winning the bid required talents that differed from the qualifications needed for organizing the Games. The bid process consisted of lobbying, improvisation and quick reactions to key individuals' changing attitudes. The organization of the Games, by contrast, is a six-year project based on a budget, schedule and a wealth of precedents from previous Olympic Winter Games.

The key question was whether to persevere with the enthusiastic but inexperienced team that had converted Salt Lake's bid into victory, or to bring in new management, with a proven track record in the organization of major projects, such as the Olympics. The decision makers included Governor Mike Leavitt, Mayor Deedee Corradini, their nominees to the executive committee of the board of trustees, Nolan Karras and Mike Danielson, and the original members of the executive committee, Spence Eccles, Verl Topham and myself. The executive committee was further enlarged by the addition of our IOC members, Anita de Frantz and Jim Easton, as well as the president and executive director of the USOC, Dr. LeRoy Walker and Dick Schultz. Meetings of the executive committee were scheduled monthly. The full board of trustees was to hold meetings, open to the public, every two months. Governor Leavitt and I held a critical discussion one morning, early in July. We concluded that the advantages of continuity outweighed those of change. Apart from internal considerations, we were influenced by signals from the IOC that they would feel comfortable dealing with the "old firm" of Welch, Johnson and Joklik, which they'd come to know well during the long years of bidding for the Games. I committed to the governor that I would continue, as a public service, to chair the board of trustees and its executive committee, and that I would work with a staff, consisting of Tom Welch as president and CEO, Dave Johnson as senior vice president of Games, and Gordon Crabtree, a most capable man who was brought in from the state to be chief financial officer. After six years of close collaboration with Tom and Dave, we've become close. Tom's a great travelling companion and has an outstanding flair for human relations. Dave is a quick study, a hard worker and popular. My role is to coordinate, direct, and catalyze, frequently behind the scenes. With this nucleus in place, the board, the executive committee, and the staff began to function as one organization, and by November, I was happy to report to the governor and the mayor that the period of transition had come to a successful conclusion.

Budget for the 2002 Olympic Winter Games

Joklik: A budget of \$798 million, expressed in 1994 dollars, was submitted to the IOC along with our bid. Inflation will increase both revenues and expenditures during the years preceding 2002. As I've said earlier, most of our sports facilities and infrastructure already are in place. The \$59 million tax dollars spent on construction of the Winter Sports Park and the Speed Skating Oval will be repaid from Olympics revenues, together with a \$40 million endowment. The bulk of the budget, therefore, can be devoted to the cost of operating the Games. To avoid risk of a budget overrun, it'll be desirable to nail down revenues ahead of major expenditure commitments. A start towards this goal already has been made through the sale of television rights. In September 1995, Tom, Dave, and I flew to Lausanne to sign a contract whereby NBC bought the United States rights from the IOC for \$545 million. Our share is \$327 million. In January 1996, the European broadcasting Union ("EBU") bought the European rights for \$120 million, of which we get \$72 million. These sales, discounted for inflation, amount to nearly 40 percent of our budget--an auspicious beginning. Corporate sponsorships, marketed by a joint venture with the USOC, will provide most of our remaining cash requirements.

Just before Christmas 1995, Tom, Dave, and I flew to Japan to present our first report, as an organizing committee, to the IOC Executive Board. We took this opportunity to look at the preparations for 1998 at Nagano. I'll have to take back anything unflattering I may have uttered when we narrowly lost to Nagano. The Japanese Alps are real mountains, the facilities built and under construction are world class, the organization works and our hosts treated us with kindness. We came away convinced that the 1998 games will be successful and fun to be at.

Our confidence was buoyed when the IOC Coordinating Commission paid us their first visit, in May, 1996. As I mentioned, our friend Marc Hodler chairs the commission. Other IOC members include Gerhard Heiberg, who chaired the Lillehammer organizing committee, and Jean-Claude Killy, who master-minded the Albertville games. We gave a detailed progress report, which took a full day. Pam and I hosted an informal dinner at our home. The commission's response to our report assured us we're on the right track. We've begun to make expenditure commitments, e.g. for host broadcasting services and a functional design program. In awarding contracts, we've adopted a procurement policy which ensures impartiality and protects the organizing committee from allegations of favoritism.

### The 1996 "Centennial" Games in Atlanta

Joklik: The Olympic games of 1996, called the "Centennial Games," have come and gone, which is hard to believe because it doesn't seem that long ago since Pam and I were aboard our cruise ship in the Dardanelles in the fall of 1990 and our friend, the Greek captain, announced that Atlanta had won the bid for 1996. He had an accent which made us believe, at first, that he'd said "Athens." We realized that Atlanta probably spelled the death knell for our bid for 1998, nine months later. And here, now, all of the preparation, countdown and celebration of Atlanta are history.

We stayed at the Marriott Marquis, which was the IOC's headquarters in Atlanta. We enjoyed seeing our IOC friends for the first time since Budapest, this time in our role as members of an organizing committee rather than as lobbyists for a bid committee. Tom Welch, Dave Johnson, our mayor Deedee Corradini, Pam and I represented Salt Lake. Representatives of the eleven cities bidding for the 2004 Olympics were frequently in evidence. They were duly deferential. After our long years of bidding, I sympathized with them.

We arrived in Atlanta about a week before competition began. Our first job was to give progress reports to the IOC's Executive Board and to the plenary session, both chaired by President Samaranch. Tom, Dave and I covered our activities. My area of responsibility included state and federal legislative issues, such as the proposed Snow Basin land exchange and Senator McCain's efforts to restrict federal funding of the security functions at the Olympics. Our reports were well received. Dr. Jacques Rogge of Belgium commented, "You're still on your honeymoon." When I asked him when the honeymoon would end, he laughed and said, "The day after Nagano."

As you will recall, during the previous six months the news media were very negative about Atlanta's preparations for the Olympics. It was clear that the organizing committee [ACOG] was rapidly running out of time and money. We were in close communication with the committee and placed several of our staff members in Atlanta to observe and to help.

During the week before the opening ceremonies, we took time to tour ACOG's headquarters, most of the sports venues and facilities such as the Athletes' Village, the International Broadcast Center, and the Main Press Center. Although we'd been warned, we were surprised to see how much was left to be done during the remaining days. For example, in the new Olympic



Stadium, wiring for the intricate communication facilities was a tangle. The stadium floor was devoid of turf.

But by and large, they did manage to be ready on Friday, July 20, the day of the Opening Ceremonies. 85,000 people packed the stadium. The cost of the event was \$40 million. The tableaux epitomizing technology, the origins of the Olympic Games and the history of the South were imaginative and well staged.

I remember walking with Billy Payne and Andrew Young from the opening ceremonies at Albertville in 1992. The French had prepared a clever, stylized presentation of winter sports. Whereas Andrew Young said he was favorably impressed, Billy expressed no sympathy for such high-brow stuff. Billy must have experienced a conversion, since the opening ceremonies of Atlanta avoided southern stereotypes and folksiness. The only glitch came when poor Muhammad Ali almost burned himself with the torch. The mechanism for hoisting the torch to the cauldron had to be improvised at short notice.

The events of the first two days exposed the strengths and weaknesses of ACOG's preparations. The sports venues were functional and packed with enthusiastic spectators. The television signal produced by Manolo Romero and his crews was picked up and disseminated by the networks; its quality was widely praised. Fortunately, Manolo has already signed up to be our host broadcaster in 2002.

Each morning at eight-thirty a.m., ACOG met with the IOC Coordination Commission chaired by President Samaranch. At the meeting on Sunday morning July 21, Billy Payne and his staff were taken to task for incidents such as athletes missing their events due to lack of transportation, inadequate communication between the Organizing Committee and all segments of the "Olympic Family," and malfunction of IBM's vaunted information systems. The IOC criticized the extent to which sponsors and vendors, on lots leased from the city, had flooded the area with unsightly advertising displays.

President Samaranch asked for Bill Campbell, the mayor of Atlanta, to be brought before the committee the following morning to explain his plans for dealing with the crowds and gridlocks that made it impossible to meet schedules. Billy Payne was under tremendous pressure. The volume of people and vehicles simply had not been anticipated.

Over the sixteen days of competition, Herculean efforts were made by ACOG to improve the transportation and communication functions. Great strides were made. Millions of people from all



over the world enjoyed the Olympics, but the after-effects of the shaky start couldn't be totally offset.

Our daughter, Katie, in her marketing functions with Coca-Cola had a lot to do with the Olympics. She and her husband, Sam, who ran Coca-Cola's Olympic Park were busy from dusk 'til dawn. Katie called us at one a.m. on July 24 when a bomb exploded in Centennial Park. We thought that both ACOG and the IOC handled that tragic incident extremely well and the citizens of Atlanta acted accordingly.

We did manage to take in a few days of competition. Our accreditations gave us access to all venues. Outstanding memories include Michelle Smith's outclassing the field in the Aquatic Center; Michael Johnson cruising bolt upright as he demolished his own world record for the 200 meters; Suleiman from Turkey hefting three times his body weight; and Carl Lewis agonizing for days after his long jump win whether to force his way onto the 4 by 100 meter relay team.

At the closing ceremonies, President Samaranch pointedly refrained from anointing Atlanta as the "best ever Olympic Games," thereby tarnishing the hoped-for triumph by ACOG's leadership. The "commercialization" of the Atlanta games was inevitable, since the precedent of private funding by sponsors had been established in 1984 in Los Angeles. IOC spokesmen such as Dick Pound of Canada said that future Olympic Games, even in the United States, would need to incorporate government financial support. President Clinton, while in Atlanta, commented along the same lines.

Our financial plan for Salt Lake City is based on private funding. Just the same, it's clear that at least in areas such as security and transportation, close collaboration between the organizing committee, the city, state and federal governments will be essential to avoid some of the problems experienced by Atlanta.

Some of our IOC friends said to us, "You're fortunate to observe the games of Atlanta because you'll be able to learn and host the best ever Winter Olympics."

I responded, "With five and a half years to go and all the lessons we're supposed to have learned, we'll really look bad if we don't live up to your expectations." Phew, talk about pressure!

## X LATE VOCATIONS

Joklik: Although the Olympics have taken up most of my time since my retirement from Kennecott in June 1993, I have kept abreast of mining industry developments, as a matter of interest. For the copper industry, the past seven years have been much more forgiving than were the previous seven years, beginning in 1980. The end of the cold war sparked an explosion of world trade which has caused the demand for copper and other industrial raw materials, to out-pace supply. We've learnt, of course, that with time, feast will again give way to famine.

I'd been sharing thoughts about the mining business with my friend Ian Cumming, an adventuresome man of many interests, who has built a major company, called Leucadia, with headquarters in Salt Lake and activities in insurance, banking and power generation. It could be headquartered elsewhere, but Ian happens to like skiing. That's how I came to know him. He has supported our bids for the Olympics, as well as many other important community projects.

In June, 1995, Ian decided to buy from Morrison Knudsen their remaining 46 percent interest in MK Gold Company. Morrison Knudsen is a long-established engineering and construction contracting company, headquartered in Boise, Idaho. You'll recall that I first worked with Morrison Knudsen thirty years ago, when we planned the Mt. Newman iron ore project. I've kept track of them since, and was dismayed by the financial misfortunes that befell them during the past few years.

Ian asked me to serve on the board of MK Gold, and when MK Gold's CEO quit, in October 1995, the board asked me to take over. Pam and I happened to be on our first real vacation since I retired from Kennecott. She needed a well-earned breather after Katie's wedding and her ongoing hard work with real estate management. We toured the hill towns of Tuscany and Umbria which were, in part, familiar to Pam, but new to me. The beauties of

the art, the countryside and the weather had us spellbound and totally oblivious to Olympics and mining. Anyway, by the time we returned to the real world, after our two-week break, the die was cast. On November 1, I took over as president and CEO of MK Gold.

In a nutshell, my task at MK Gold is to realistically appraise and stabilize the existing enterprise, and start building from this very meager base. Opportunities for acquiring new assets abound world-wide, but good ones are hard to come by. Perseverance and a bit of luck will be key. We've moved corporate headquarters from Boise, Idaho to Salt Lake City.

Friends have asked, "Why would Frank want to take on MK Gold, in addition to his Olympics obligations?" They're also asking, "Why is Pam starting up an antiques business called 'The Country Home,' when she's already fully occupied with real estate management and community activities?"

I suppose the answer is that while we're still hale and hearty, it's difficult to resist a challenge.

Swent: Thank you very much, Frank, it's been a wonderful interview.

Joklik: Thank you, Lee, I couldn't have done it without you.

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**GÜNTHER FRANZ "FRANK" JOKLIK**

Born: May 30, 1928, Vienna, Austria

|             |                                                                                                 |
|-------------|-------------------------------------------------------------------------------------------------|
| 1995 - Date | President and CEO, MK Gold Company<br>Eagle Gate Tower<br>Salt Lake City, Utah                  |
| 1991 - Date | Chairman, Board of Trustees<br>Salt Lake Organizing Committee for the 2002 Olympic Winter Games |
| 1974 - 1993 | Kennecott Corporation                                                                           |
| 1980 - 1993 | President and CEO                                                                               |
| 1979 - 1980 | Senior Vice President, Technology, Minerals Division                                            |
| 1974 - 1979 | Vice President, Exploration, Mining Division                                                    |
| 1963 - 1973 | Amax, Inc.                                                                                      |
| 1973        | Vice President                                                                                  |
| 1968 - 1973 | General Manager, Kimberley Bauxite-Alumina Project                                              |
| 1963 - 1967 | General Manager, Mt. Newman Iron Ore Company                                                    |
| 1954 - 1962 | Kennecott Copper Corporation                                                                    |
| 1960 - 1962 | Assistant Vice President, Exploration                                                           |
| 1954 - 1959 | Exploration Geologist                                                                           |
| 1949 - 1953 | Bureau of Mineral Resources, Canberra, Geologist                                                |

**DIRECTORSHIPS**

|             |                                               |
|-------------|-----------------------------------------------|
| 1994 - Date | Director, Cleveland Cliffs, Inc., Cleveland   |
| 1981 - Date | Director, First Security Bank, Salt Lake City |

**EDUCATION**

|         |                                                                               |
|---------|-------------------------------------------------------------------------------|
| 1949    | B. Sc. First Class Honours Geology, University Medal;<br>University of Sydney |
| 1953    | Ph.D., Geology; University of Sydney                                          |
| 1953-54 | Fulbright Scholar; Columbia University                                        |
| 1960    | Program for Management Development; Harvard University                        |

**DISTINCTIONS**

|      |                                                   |
|------|---------------------------------------------------|
| 1989 | Copper Club; Copper Man of the Year               |
| 1989 | Elected Member, National Academy of Engineering   |
| 1991 | AIME, William Lawrence Saunders Gold Medal        |
| 1992 | SME, Distinguished Member Award                   |
| 1992 | People of Vision Award (with Pam), Salt Lake City |
| 1994 | Giant in our City Award, Salt Lake City           |
| 1994 | Honorary D.Sc., University of Utah                |
| 1995 | Appointed Honorary British Consul, Salt Lake City |





## THE OLD CRANBROOKIAN

VOL. 25, No. 2, JUNE 1987

# A SPLENDID TRIBUTE

As a means of expressing their gratitude for what help the School afforded them and their mother when they were here in the late 1930's and early 1940's, the brothers, Wolfgang (Bill) Karl Joklik (1938-43) and Gunther Frank Joklik (1938-44) have made a very generous gift to the School in memory of their mother, Mrs Helene Joklik. The gift will be used to provide the Helene Joklik Scholarship Endowment and will be administered by the Cranbrook Foundation Limited.

The brothers have written a letter, which we publish below — a letter explaining the idea behind the Endowment. No one reading this letter could fail to be impressed by the nature of the bond between mother and sons and by the admirable intention of the sons to honour her memory in this way. The letter, addressed to the Headmaster and the President of the School Council, says:

*The Headmaster*

*The President of the School Council*

*The HELENE JOKLIK Scholarship Endowment meets our objectives of contributing to Cranbrook and honouring our mother's memory. Perhaps we could briefly explain how the two are related.*

*Our education at Cranbrook was a happy experience — in the classrooms, on the playing fields and in terms of friendships, some of which have endured to this day. But the experience was overshadowed by the events of World War II under an unusual set of circumstances.*

*When our father accepted a business assignment in Australia which brought our family from Vienna to Sydney early in 1938, the possibility of war had not occurred to us. We were enrolled in the Junior School which was then in Harvey House. Even after war broke out and our father was interned, we were convinced that the conflict would be brief and localized. But as the months passed, hopes of peace faded and the funds available to our mother for our sustenance dwindled, without any possibility of replenishment.*

*Our mother was an attractive, tender, highly intelligent woman whose education as a teacher and musician had been enriched by the tremendously varied cultural life of Vienna. Since there was little demand for her qualifications in war-time Sydney, she knuckled down to domestic work in order to support us until after the end of the war. Without that sacrifice our continued attendance at Cranbrook would not have been possible.*

*We hasten to give credit also to the remarkable men who taught at Cranbrook in those years, as well as to our fellow students, who made us feel that we belonged, despite our different origin. Australia in those days wasn't as cosmopolitan as it is today, to say the least. The many kindnesses shown us by Major General Sir Iven Mackay, the Reverend F. T. Perkins, Sir Brian Hone and all the masters were deeply appreciated.*

*Because of our scholastic performance, the School Council arranged a waiver of our fees when it appeared that we could no longer make ends meet — an extraordinary act of generosity. Out of a deep sense of obligation our mother eventually paid every penny of*



Mrs Helene Joklik.

*what she regarded as a debt, although the School had never demanded payment.*

*As we now look back, we recognise how we benefited from our scientific and technical studies at the universities we attended, beginning with the University of Sydney. But it was the logic and language taught at Cranbrook by the likes of Bell, Child, Hone, Felton and Perkins that provided us with the foundation on which to build.*

*We feel that there is no better way of expressing our gratitude for what we received from the School and our mother, in those turbulent times long past, than to afford others the opportunity of enjoying a Cranbrook education.*

*Sincerely,*

*Wolfgang K. Joklik*

*Gunther F. Joklik*

The President and Headmaster, on behalf of the School, expresses sincere thanks for, and appreciation of, the generous gift made by the two brothers.

Both brothers will be remembered by those who knew them at Cranbrook for the brilliance of their academic achievements both at School, at University and also for their outstanding success in their subsequent career.





**EDUCATION -- THE NEGLECTED FACTOR IN PRODUCTIVITY**

G. Frank Joklik  
President  
Kennecott Corporation  
Salt Lake City, Utah

Keynote Address at  
AIME Annual Meeting Luncheon  
Dallas, Texas

February 15, 1982

Mr. Chairman, Ladies and Gentlemen

My remarks today will deal with the present plight of the mining industry, the decline of productivity growth and the unfulfilled role of education.

There is no reason for me to single out the mining industry as the only one which is suffering from poor educational standards. My comments could apply equally to other industries, but my experience and the experience of most of you has been in the mining industry. What I have to say is based on my observations of inefficiencies, brought about by education which is inadequate for identifying, analyzing and solving problems; and of good men and women who will never realize their potential, and whose career paths are blocked because they did not receive a sound education.

Before venturing further into this difficult arena, a caveat: I stake no claim to being an educator; but since the products of good education, namely, enlightened and trained minds, are most important tools in operations and management, education interests me deeply.

I'll begin with a review of factors of productivity, one of which, in my view, is education; and then discuss how educational standards impact our business in fields such as labor relations, problem solving, communications and planning. Finally, I'll briefly suggest what can be done to improve education and, in turn, improve productivity.

### Productivity

At a time when the nation's utilization of its industrial productive capacity is only 73%, and nine out of a hundred persons are without jobs, productivity is a frequent news item and subject of interpretation, debate and exhortation. When the President is obliged to establish a National Productivity Advisory Committee, consisting of business and labor leaders, we know that low productivity has become a politically uncomfortable issue and that no near-term improvement is in sight.

In terms of gross domestic product per employee, the United States still leads all other industrialized nations; but the growth rate of labor productivity, which was running at 2 to 3% annually, from the end of World War II until the early 1970's, has dwindled virtually to zero. Less productivity growth means less room for improvement in our standard of living; and since productivity growth is lagging behind the growth of the money supply, it contributes to inflation.

Particularly in the mining industry, the productivity of labor is influenced by the amount of capital invested per worker. In Kennecott's operations, for example, the number of tons of material mined per man hour has risen steadily as a result of investment in larger, more reliable equipment. We're also investing in the modernization of our concentrators and smelters in an effort to increase the output of copper per employee.

But nation-wide, the annual growth rate of capital invested per worker has fallen from 3% to zero since 1974, which accounts for the present administration's efforts to stimulate investment by easing the burdens of taxes and unwise government regulations on industry.

Quantitative changes in the work force have also helped to drive down the growth rate of productivity. As a result of the coming of age of the baby boom generation and the increasing participation of women in the work force, the civilian labor force in the United States grew at the exceptional rate of 2.6% per year in the 1970's while the total population grew at only 1.1%. The labor force growth is predicted to decline to 1.3% in the 1980's and to 1% in the 1990's.

Have qualitative changes also influenced productivity? The quality of the work force is determined by its physical and mental skills; the Romans valued "mens sana in corpore sano"--a sound mind in a sound body. Physical skills are taken for granted in our sports-loving society. But the real competition is in terms of mental skills which cannot be taken for granted.

Although mental skills are a function of education, most analyses of productivity I've seen essentially ignore education as a significant factor.

## Education

Recently, I read a newspaper filler in which education was defined as the difference between what you learn at school and what you subsequently forget. That's like calling Bingham Canyon merely a hole in the ground. Education is the development of mental discipline and the ability to think logically, qualities which remain with an educated person throughout his life. Education need not be acquired in the class room. Self-made men such as Andrew Carnegie, Joseph Hirshhorn and John D. Rockefeller had little formal education. But in the biographies of such men one generally reads of a period in their lives when they experienced a thirst for knowledge which they satisfied by educating themselves.

During fiscal year 1981, state and local governments spent about \$100 billion on elementary and secondary education. About 99% of our young people now attend high school and three-fourths graduate, compared to only one-third in the 1930's and one-half in the 1950's. But as attendance has been rising, standards have been slipping. Scholastic Aptitude Test scores, which are intended to measure the verbal and mathematical competency of high school graduates, have been declining steadily since 1964.

Students are increasingly shying away from so-called "solid" subjects, such as English, mathematics and the sciences; instead, they are selecting subjects which schools have been forced by social pressures to incorporate in their curricula -- courses in environment, energy, parenting, career education and drug abuse.

That the equal educational opportunity we've attained isn't synonymous with equal ability or equal achievement is one reason for the declining academic standards in our secondary schools. Poor qualifications and motivation of teachers are others. There are probably few parents here who haven't had cause to complain, at one time or another, about the cavalier attitude of at least some of their children's teachers to the job of teaching.



Educators in the colleges and universities have taken pains to document the deficiencies of secondary schooling, because such data help explain the costly remedial teaching programs they have to offer in order to plug the gaps in the basic education of the high school graduates they admit. Although there is little quantitative evidence to support it, the conclusion must be that the graduation requirements of universities have fallen in sympathy with admission requirements -- a conclusion which is of critical importance to industry.

The shortcomings of our educational system are evidenced by declining literacy in English and mathematics.

Grammar and punctuation are ignored in most public schools; few high school graduates can, therefore, write an unambiguous sentence, let alone a coherent paragraph. Yet, according to Norval Rindfleisch of Phillips Exeter Academy, "writing is composing and composing is a decision-making process of great complexity, even on the simplest level. It's more than grammar, spelling, or punctuation; it's above all, thinking, feeling, ordering, organizing . . . Students often find out what they really know by being forced to write."

The ability to write can bring practical benefits. In a recent cartoon, a dapper-looking businessman is arraigned before the sergeant at the local precinct. "I realize," he says, "I'm allowed one phone call - so I'd like to call my publisher."

The decline of literacy in mathematics and science is less well publicized than that of language abilities, but is potentially even more harmful in this technological age. It's been estimated that one-half of all high school graduates take no mathematics or science courses beyond the tenth grade. The pity of it is that potential careers in engineering and science may thereby be nipped in the bud.

Comparisons with academic curricula in Japan, Germany, and unfortunately, the Soviet Union, show that the neglect of mathematics and the sciences by our students is by no means matched in those countries. This disparity is reflected in the much higher proportion of engineers graduated from their universities. Many of those graduates eventually work

in fields other than engineering, in management or the civil service for example, but their education enables them to understand and participate in the resolution of technological problems in their fields of work.

### Impact on Industry

In thinking about the impact of declining educational standards and, therefore, reduced mental skills on our industry, we could conclude that the decline is too recent to have affected productivity. Even so, it would be dangerous to rely on the educational standards of 15-20 years ago, considering the increasing complexity of industry; and the full impact, if yet to be felt, would wreak havoc on productivity in coming decades.

Fortunately, the dark cloud of declining educational standards has a silver lining, in that the amount of schooling received by our labor force has been rising. At our Utah Copper operations, for example, the percentage of those hired with 12 or more years of education has increased from 50% in 1960 to 90%. The higher level of education of the unionized workers qualifies them for assignments that are less restrictive than formerly and require greater mental skills; it enhances their ability to take advantage of the trend towards automation in our operations; it also increases the pressure on management to perform its duties effectively; and it gives union leaders an awareness of business realities which is an important factor in labor negotiations.

The relationship between labor and management in our industry has followed a rockier path than the exigencies of international competition permit. The reductions in the costs of production which we in the non-ferrous metals industry see as being necessary for our survival will require a team effort by the employees in all functions of our organizations.

Education permits the participation by all workers in problem solving and brings about a constructive attitude to the job which is essential to the achievement of improved productivity. A maintenance man with the right attitude, who devises a new way of effecting a difficult weld, may have more impact on a company's bottom line than a manager who has reorganized a staff department for the third time in as many years.

There's an anecdote about attitude for which I'm indebted to Frank McKee, President of the United Steel Workers.

It seems that a shoe manufacturing company decided to investigate the market for its products in darkest Africa, and sent off one of its bright, young men to do so.

After a couple of weeks, the young man phoned headquarters and said, "For Heaven's sake, get me out of here. These people don't wear shoes; we'll never sell anything here." So the company brought him back; but before giving up, they sent out another man.

After a week, he phoned back and shouted, "Send out all the shoes you've got; these people don't wear any yet!"

Problem solving requires education. Some high schools offer a course in "problem solving." Those who avoid the rigors of language and mathematics and take this course as a shortcut are doomed to disappointment. Only a sound education develops the ability to ask the right questions, analyze alternatives, draw conclusions and implement them.

In light of today's slim or non-existent margins between costs and prices, operating problems must be addressed with imagination and initiative. Engineers must beware of spending insufficient time and effort in the conceptual phases of new projects. Some feel comfortable to be done with critical questioning and to immerse themselves in the design of one alternative which may, after the expenditure of thousands of man-hours, prove to be inferior to other alternatives.

Effective communication by and within our industry depends primarily on the education of the communicators. The communications gap between technical and non-technical professional workers is widening because of the decline in the numbers of students who take courses in mathematics and science in high school and college.

The majority of our population, although enjoying the benefits of science and technology, in the form of a high standard of living, has no understanding of scientific principles. Most detractors of nuclear power

have not even a rudimentary knowledge of nuclear reactions. Self-styled environmentalists have no comprehension of the scientific basis of the issues about which they wax eloquent. Environmental "public interest" groups find fertile ground among the population for their demagoguery. Engineers in industry, on the other hand, are handicapped by their poor command of English in responding to their tormentors' emotional pitches.

Communications within our organizations aren't necessarily more effective than are those between our industry and other segments of society. Poorly conceived and written reports to peers and to management cause misunderstandings and necessitate duplication of effort. Careful writing and critical reading are replaced by group sessions in which picture-book presentations are used as a means of communication. These presentations do not test the depth of the author's knowledge of his subject, nor the alertness of the audience.

The MIS function is a mystery to most managers because the understanding which most managers have of the workings and potential applications of computers is minimal. Complicated programs of information gathering and interpretation tend to be devised and implemented before the practical application of the results has been defined. Yet, a well educated and trained MIS staff can provide knowledgeable management with an invaluable channel of communication with the most complex operations.

The planning function, like MIS, suffers from mis-use and unrealistic expectations on the part of those who have not been educated in its proper use. The language of planning is occasionally marred by semantic shenanigans, such as the word "synergism," which is used to justify ill-advised mergers; or "strategy" and "tactics," which afford the user a vicarious military hue.

Planning documents qualify most nouns with adjectives such as "meaningful" and "significant" -- a warning signal that substance is lacking. The recent popularization of strategic planning theory, in terms of such jargon, has led to blunders, such as a wholesale transfer of a planning system from one industry in which it worked well, to another industry in which it led to erroneous conclusions and, worse still, actions.



The visual acuity of so-called long-range planners has grown exponentially. Paradoxically, some of these practitioners find it expedient to drastically alter their long-range plans every 12 months. Robert Burns, the Scottish poet, saw through them and wrote: "The best laid schemes o' mice an' men gang aft agley."

Charting the course ahead is management's most important responsibility. A planning function which effectively assists management in this endeavor is invaluable; but on occasions, managers whose educational background lacks breadth and depth, tend to reverse the relationship and abdicate their responsibilities to the planning function.

Good managers, according to Edward Wrapp, Professor at the Graduate School of Business at the University of Chicago, don't even waste time in producing fully grown decision trees; rather, "they start with a twig, help it grow, and ease themselves out on the limbs only after they have tested to see how much the limbs will stand."

### Remedies

I've dealt with several fields of activity in which education impacts the operations of our industry. Since, for the most part, I've complained about inadequate educational standards, I should devote some thoughts to raising them.

Earlier in my remarks, I pointed out that the rising enrollments in our secondary schools, during the past two decades, appear to have been contemporaneous with a documented decline of academic standards. The rapid growth of the student population evidently over-strained the school system.

A reversal of this trend has already begun and will continue in the years ahead, as is indicated by forecasts of reduced school enrollments in the 1980's and 1990's. Under the circumstances, we are faced both by a threat and an exceptional opportunity.

The threat is that funding of public schools by local governments and states will be cut in proportion to the declining numbers of students. The



quality of education received by a smaller student population would then remain poor or deteriorate further, as fixed costs accounted for progressively higher proportions of declining school budgets.

The opportunity is that by divorcing school funding from enrollment numbers, the quality of education could be raised by providing smaller class sizes, more individual attention by better qualified and motivated teachers, and more thorough instruction in fundamentals such as mathematics and language.

Since public awareness of the need for improving the quality of education is acute, there is reason to hope that local and state governments will be responsive and seize the opportunity. Perhaps the findings of the President's National Commission on Excellence in Education will add fuel to this benign blaze.

Universities and colleges should support the improvement of secondary education by insisting on minimum standards of admission and bucking the burden of remedial education. Certain enlightened educators, such as Dr. David Gardner, President of the University of Utah, are eloquent champions of this cause.

In addition to governments and educators, it's up to industry, the ultimate beneficiary of higher educational standards, to play its part by demanding academic excellence from its recruits, and affording those who can match their education with performance the career opportunities which will enable them to develop and utilize their potential.

H. G. Wells maintained that "Human history becomes more and more a race between education and catastrophe." Although education has fallen behind, history until now has proved that ground lost can be made up. On the other hand, a complacent attitude toward continuing mediocrity would only impede restoration of a healthy growth rate of productivity. In my view, educational standards, like other determinants of productivity, must not only be maintained, but must steadily rise to satisfy the increasing technological and social needs of our society, as well as meet military and economic challenges our next generation may face.

## What, If Anything, Is Wrong with the Minerals Industry? - a CEO's Perspective

by Frank Joklik

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When I was asked to speak to you, I cautioned that since my "retirement" from Kennecott, in June 1993, demands on my time have been heavy. I was, therefore, given a subject that looked easy at first glance - "what is wrong with the minerals industry?" I racked my brain, but made little progress until I happened to leaf through an old and trusty source of inspiration - Agricola's *De Re Metallica*. What is at the root of our industry's problems? Agricola knew, and he wrote:

"In some of our mines, however, though in very few, there are other pernicious pests. These are demons of ferocious aspect, about which I have spoken in my book *De Animantibus Subterraneis*. Demons of this kind are expelled and put to flight by prayer and fasting."

These demons began to appear in my dreams and I recognized their physical resemblance to some of those who maintain that there is a great deal wrong with the minerals industry. What to do? I resorted to prayer and fasting, as prescribed by Agricola. My nightmares vanished. There also has been a corresponding improvement in the fortunes of our industry.

I am, nevertheless, afraid there may never come a time when all the demons plaguing the minerals industry have been exorcised. A look back over my experience does not guarantee that the future will necessarily be rosy. Since part of my career has been in copper mining and processing, please forgive me as I draw on copper for illustrations. A recent publication of the United States Bureau of Mines is entitled, "Metal Prices in the United States Through 1991." It describes "significant historical events and their influence on copper prices." Over the past 100 years, these events include war periods, labor strikes, political insurgencies, operating accidents, government monetary policy and inflation, consumption growth and recession, cartel actions, speculation and nationalization. Considering such a broad array of impacts, mostly beyond the control of operating managers, how can we complain about the historical "volatility" of copper prices? Or, how can an industry buffeted by storms from every point of the compass, ever achieve "stability?" It might be more appropriate to ask: "Are we doing better or worse than we were at other times, in anticipating and responding to changes that affect our indus-

try?" Let's take a look at recent history, grade our performance today and then speculate briefly on the future.

The art of managing a mine or a processing plant is the ability to respond to change — preferably in plenty of time for a response to be planned and deliberate. To avoid a need for precipitate, unorganized action, the circumstances requiring action must be foreseeable and foreseen. Examples of such circumstances are changes in the physical and chemical characteristics of ore, obsolescence of equipment due to age or technological advance, or the imposition of environmental constraints on operating practices. Effective managers keep abreast of their current operations and scan the horizon for signs of future opportunities and problems. They concentrate the human resources at their disposal to take advantage of opportunities and forestall problems.

These precepts for effective management of changes in operating parameters are equally applicable to sea changes on a national or even world-wide scale. Such changes tend to be recognizable with the benefit of hindsight and are generally amenable to analysis in isolation. Although they are almost always associated with more or less far-reaching side effects, they can be dealt with individually, in terms of cause and effect. It is unusual for several such major changes to occur within the same time frame. But, in my experience, such a bunching of events did take place in the early seventies and, incidentally, coincided with a change in my career.

It happened at a time when I returned to the fold of Kennecott, after ten years in the exciting growth of AMAX's iron ore and aluminum businesses. When Ian McGregor, who was then running AMAX, learned of my defection, he said, "Aha! You have been lured by our rich cousins." Perhaps there was irony in his comment. Perhaps he could foresee an end to decades of affluence in the copper business.

The environment I discovered at Kennecott, in the winter of 1974, had not changed much since my departure ten years earlier. But the domination of world trade in copper by a handful of American and



British owned companies had ceased. Although the 1971 expropriation of Kennecott's Chilean mine, El Teniente, was still being digested, broad margins between copper prices and the costs of production were being taken for granted and reflected in generous payouts of dividends. Cycles of alternating periods of high and low metal prices tended to be of regular duration and provided little incentive for planning ahead. Not much had changed during the decade of my absence.

But then, all hell broke loose. The oil crises of the early 1970s and the ensuing inflation drove up production costs to levels that endangered competitiveness. Reduced growth of the national economy dampened the industrial demand for copper. The nationalization of mines in Third World countries put an end to the control of copper supply by the corporate oligarchy, the effect of which was exacerbated by subsidized expansion of production by the nationalized mines. Overshadowing these adverse influences on trading conditions was the growth of a worldwide environmental movement, the demands of which on industry were likely to reinforce the upward trend of commodity production costs.

During the 1970s, the minerals industry reacted to these threatening developments in a laid-back manner. The sea changes which later turned out to be secular tended to be regarded as cyclical. A return to "normality" was anticipated and incorporated in management philosophy.

But things did not return to normal. When the helm of Kennecott was entrusted to me, early in 1980, a brief recovery of the national economy, coupled with a lengthy labor strike, had caused a spike in metal prices which served as a band-aid to an ailing industry. After several decades of affluence, a long drought was foreseeable. The U.S. economy recovered, but copper markets did not because consumption remained at low levels and the oversupply of metal was reinforced by Third World producer policies that were influenced by objectives of full employment and hard currency sources, rather than market considerations.

Kennecott was in a vulnerable condition. Our forecasts convinced us that world-wide surplus inventories would take years to be reduced to normal levels and that, in the meantime, the company's relatively high cost of production would cause operating losses of a magnitude that could not be sustained. In response to this threat, a three-pronged strategy for survival was developed. The elements of this strategy were

1. Reduction of production costs, using the existing facilities and equipment.

2. Investment in new technology and equipment that would yield maximum benefits.
3. Diversification through discovery of opportunities for investment in new mines.

First, then, we set out to cut costs without major capital investment. At the same time, we began an evaluation of alternatives to replace worn out, outdated plant and equipment with modern facilities.

During the early 1980s, our cost cutting program trimmed away the fat in the operations. The program involved revisions of long-standing attitudes and assumptions, adjustments in management practices, attention to purchasing economies, transformation of labor relations, improvements in operations, and advances in process efficiencies.

The most difficult task was the permanent manpower reductions which affected all levels of the organization. Operating schedules were streamlined, redundancies eliminated, job functions combined, and work ethics improved. Layoffs on this order of magnitude had not previously been implemented in the minerals industry or, for that matter, in most other industries. They could not have taken place without prior conditioning through a program of communication in which the dire outlook for the industry was explained to the work force in a convincing manner.

At Utah Copper, the reduction amounted to 33 percent, from 7,000 to 4,700 employees. Operating changes included the replacement of the rail system used to haul ore in the lower reaches of the pit by haulage trucks. The switch to trucks increased flexibility in mining and permitted Utah Copper to reduce the stripping ratio, raise the ore grade, increase the size of the ore loading shovels and reduce operating and maintenance manpower. Unfortunately, record cold and wet winter weather, coupled with continually declining metal prices, outpaced our improvements. The Bingham Canyon mine had to be shut down in the spring of 1985 and operations resumed only after we negotiated a new labor contract in 1986.

The new contract provided for changes in work rules that cleared the way for productivity-enhancing improvements in processing and operating practices. The resumption of operations at Bingham Canyon in 1986 was the quid pro quo for the concessions made by the unions, which amounted to a 35 percent reduction in the cost of hourly wages and benefits. The cumulative gain of the cost reduction program which began in 1980 was to double productivity and halve the real costs of copper production.

Meanwhile, plans to modernize the operations at Bingham Canyon had matured. One alternative was selected from the dozens analyzed. It comprised the



installation of an in-pit crusher and conveyor system and slurry pipelines for the transportation of tailings and copper concentrate. A new state-of-the-art concentrator was built near the mine, avoiding, in part, the costly rail haul to the existing concentrator. The whole project cost \$400 million, was completed ahead of schedule and within budget in mid 1988 and was immediately followed by a \$227 million expansion that boosted annual copper production to 300,000 tons. When these facilities reached full production, labor productivity reached three and a half times the level of 1980 and the real costs of copper production were 75 percent lower.

After the modernized facilities were commissioned in 1988, the smelter continued to be the black sheep of the integrated Utah Copper operations. Problems with the performance and availability of equipment and tightening environmental requirements reduced the effective capacity of the smelter. By 1992, this plant was able to process barely 60 percent of the concentrates produced by the expanded Utah Copper operation. After much soul searching, we came to the conclusion that the existing smelter should be scrapped and replaced by a brand new flash smelting and converting plant that would incorporate the most advanced technology available. In March of 1992, Kennecott and its parent RTZ Corporation announced an \$880 million project to build a new smelter and modernize the existing refinery. When it is completed in 1995, the smelter will be the cleanest in the world. Including a \$500 million expansion of the tailings pond which is under way, the head-to-toe modernization of the Utah Copper operations will have cost \$2 billion, which was justified by the prospect of at least another quarter century of profitable operation based on this jewel of a resource in the diadem of Mother Nature.

The third string to the bow crafted by the new management of Kennecott in 1980 was diversification to reduce the company's dependence on copper. Throughout the lean years of the early 1980s, an exploration effort was maintained in selected parts of the world. North America received the lion's share of funds expended, but South America and the Southwest Pacific were not neglected, as opportunities were identified. The emphasis on precious metals exploration and acquisition resulted in the development of six new mines—Alacran, Mexico; Rawhide, Nevada; Barney's Canyon, Utah; Ridgeway, South Carolina; Green's Creek, Alaska; and Flambeau, Wisconsin. The Crixas gold discovery in Brazil was sold for a handsome payment. The Lihir project, Papua New Guinea, is based on a huge volcanic-hosted gold resource. Its development depends on the outcome of continuing political and financial negotiations, and now appears to be imminent.

The new mines have appreciably enhanced Kennecott's earnings from its copper operations. But, as the 1980s came to a close, it was felt that the availability of important coal reserves in the U.S. presented an opportunity for diversification into the energy field. After lengthy analysis, we decided to initially concentrate on the Powder River Basin and negotiated the acquisition of Nerco, Inc. and Cordero Mining Company. In the ensuing purchase which was concluded last year, shortly before my retirement, Kennecott bought a billion tons of coal reserves and the capacity to produce in excess of 30 million tons per year. Finally, diversification was initiated into another form of the element carbon with a somewhat higher unit value. The discovery of diamonds in the Lac de Gras area of the Northwest Territories in 1990 and 1991 encouraged us to take up a major land position. Our subsequent work program turned up numerous diamond-bearing kimberlite pipes. Published information from the area gives every indication that gem quality diamond mines will be developed.

The restoration of national and international competitiveness of Kennecott was reinforced by the resurgence of copper prices which began in the second half of 1987. The longevity of this rally has confounded pessimists and demonstrates the extent to which the lean times of the early 1980s had depleted the domestic copper industry's ability to meet the demands of a broad economic recovery. Other copper producers responded to the challenge of heightened international competition by also trimming the fat from their operations. By the end of the 1980s, the U.S. copper industry had moved from the peak of the cost curve to a position of lower profile and had, thereby, set an example for other segments of U.S. industry to follow. We called it simply "cost reduction," which is now more fashionably known as "downsizing," "restructuring" or "re-engineering."

All in all, the copper industry and, more broadly, the minerals industry had responded with vigor and effectiveness to the onslaught of sea changes of the early 1970s. An overly critical eye would be needed to find substantial fault with today's industry in its technological and financial performance.

As the industry regained its health, it gradually focused on the environmental aspects of the business which it had been forced to subordinate during the struggle for survival. The quality of the industry's increased responsiveness to environmental concerns merits analysis.

The poor public image of the minerals industry is not new. Again quoting from my favorite 16th Century source, Agricola wrote: "the strongest argument of the detractors is that the fields are devastated by



mining operations...that the woods and groves are cut down. And when the woods and groves are felled, then are exterminated the beasts and birds...Further, when the ores are washed, the water which has been used poisons the brooks and streams, and either destroys the fish or drives them away."

No one who has visited the ravaged coal fields of Appalachia or the unreclaimed phosphate mines of central Florida, or has seen at close quarters the worst effects of acid mine drainage in Colorado, can come away with a feeling of warm friendship for the minerals industry in days gone by. These practices, formerly justified by the need for human survival and the growth of a nation, now lend force to public pressure for revisions of the 1872 Mining Law.

Environmental extremists complain about the purportedly imminent exhaustion of the earth's non-renewable mineral resources. They claim that the concept of sustainable development is not applicable to the extractive industries. Thomas Malthus and, more recently, the Club of Rome, forecast that we were going to run out of mineral and food resources long before now. They were wrong because they forecast demand growth as a geometric progression and supply as an arithmetic one. In the case of copper, the Club of Rome forecast exponential demand growth at a rate of 4 percent annually and concluded that the global reserves then published by the United States Bureau of Mines as 308 million tons would be exhausted within 21 years, that is by 1993. And here we are near the end of 1994, with published reserves of economically recoverable copper of 310 million tons within a reserve base of 590 million tons and total estimated land based resources of 1.6 billion tons. Exploration has clearly yielded much richer dividends than anticipated.

The current outlook for the supply of minerals has been temporarily clouded by trade of the former communist countries. On the one hand, the rapid growth of the economies of China and other southeast Asian nations represents new markets for mineral products. On the other, diminished demand in the former Soviet Union opened a flood of exports that has depressed prices of some commodities. But, these surpluses are in the process of being absorbed by the global economy and, in some instances, are being dampened by international agreement. The recent accord to curtail production in the aluminum industry, with the surprisingly overt concurrence of the United States government, is an interesting example.

On the demand side of the equation, consumption has grown at a much slower pace than the Club of Rome forecast, because of more efficient usage, substitution by cheaper commodities, and technological breakthroughs like optic fibers in the communications

industry. The forecast also failed to take into account technological and societal changes, as a result of which minerals left in the ground remain worthless. As examples, consider the nitrate mines of Chile, the uranium deposits of the Colorado Plateau, and the environmental pressures that are encroaching on the scope of the lead industry. Taking into account these factors, that enhance supply and mitigate demand, it is by no means unreasonable to apply the concept of sustainable development to the earth's non-renewable resources.

The current practice of environmental control of the minerals industry is mostly a reaction to the command-and-control philosophy of environmental legislation and its elaboration by the regulatory agencies. The Clean Air Act, the Clean Water Act, the Hazardous and Solid Waste Act, the Resource Conservation and Recovery Act (RCRA), the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), and the Surface Mining Control and Reclamation Act (SMCRA) govern the lives of today's mine and process plant managers, as they strive to minimize discharges to the atmosphere and to surface and underground waters. Zero discharge requirements are standard for the issuance of NPDES permits under the Clean Water Act.

Zero discharge to the atmosphere is more difficult to attain. The Utah Copper smelter presently under construction comes close, in that only six pounds of sulfur dioxide will be emitted to the atmosphere for each ton of blister copper produced. The engineering of this plant is an excellent example of "design for environment", since both environmental and economic considerations drove the implementation of the project. Such care in design is fairly original in the minerals industry.

Land reclamation is required by state and federal laws and is uniformly practiced in surface coal mining. Hard-rock miners are faced with questions of economic feasibility when it comes to reclaiming open pits at the end of mine lives. Contouring waste dumps and revegetating tailings ponds are standard practice, but the mind boggles at the thought of loading five billion tons of material back into Bingham Canyon.

The legacy left by a century and a half of mining, during which environmental regulations were virtually non-existent, remains to be dealt with. CERCLA, or Superfund, was a legalistic attempt to solve a problem the ramifications of which extend far beyond the reaches of courts of law. CERCLA has failed to gain admirers from any of the interest groups whose demands it was designed to satisfy. The so-called transaction costs associated with the implementation of the Superfund process are claimed by some to have out-



weighed the costs of remediating contaminated land and water.

To illustrate this point, the mining history at Bingham Canyon goes back over a century to the days when waste was dumped in the most convenient location and tailings were flushed down the nearest water course. Surface and underground lead-silver mining began long before the great open pit copper mine was developed and left metal-bearing residues in scattered locations along the western margin of the Oquirrh Range. Most of this land is now owned by Kennecott. The EPA placed these sites on the CERCLA list and, after going through the Hazard Ranking process, threatened to declare the whole property, including the current operations, as a Superfund site. Although there was not a shred of evidence that anyone's health had been threatened, we devised a clean-up program costing tens of millions of dollars and proceeded to move the metal-bearing waste rock and tailings to lined repositories. We attempted to negotiate an agreement with the EPA covering this voluntary remediation project, but had difficulty coming to an equitable settlement, which demonstrates the inflexibility of the current CERCLA law and regulations. Meanwhile, mining and mineral processing companies will continue to be reluctant to cooperate with the EPA, as long as cooperation can draw harsh penalties.

The definition of contamination that represents a threat to human health is a major bone of contention between the EPA and industry. There are well documented examples of arbitrary standard setting that have resulted in the wastage of large sums of money. At the Smuggler Mountain Superfund site near Aspen, Colorado lead, zinc and cadmium levels found in soils exceeded EPA standards; but the lead blood level of preschool children living in the area was shown to be less than 50 percent of the U.S. general population. Local residents rose up in arms over the costly remediation proposed by the EPA and, so far, have maintained the upper hand.

The lack of rationality applied to standard setting is symptomatic of a lack of good science that has, all along, tainted the environmental debate. As you know, perceived threats of ozone depletion, greenhouse effect, acid rain and asbestos emissions are causing expenditures of tens of billions of dollars, but are based on doubtful scientific evidence. We are dealing here with significant chunks of GDP for which there would be alternative uses in combating poverty, ignorance and disease.

Sound education is the antidote to public hysteria and misleading standards of health and safety. I recently attended an advisory board meeting at one university at which an undergraduate course titled

"Earth Systems," is attracting scores of students. The curriculum is an exceptionally heavy work load that includes core science subjects, as well as an introduction to the environment in which we live. The graduates from this kind of program are the people we need in positions of responsibility at the regulatory agencies for a dialogue between government and industry to be fruitful.

To summarize these comments on mining and the environment, the mining industry is generally meeting federal and state standards for land reclamation, control of emissions to air, soils, surface water and ground water and the safe disposal of hazardous wastes. But we cannot deny that an even more proactive attitude by the minerals industry is warranted in preventing pollution, designing for environment and voluntarily cleaning up historic contamination.

The future of the minerals industry depends at least partly on the industry's acceptance by the public. Complaints that we are not well understood are as old as the hills. Diatribes against regulatory agencies and the public tend to backfire. On the other hand, I am encouraged by the fact that every time I pick up an industry journal, I find reference to yet another conference with variations on the theme of mining and the environment. I recently chaired a section of an international symposium entitled "Industrial Ecology," sponsored by the National Academy of Engineering. Our section dealt with the extractive industries. My initial skepticism regarding a worthwhile outcome of the meeting gave way to satisfaction with a constructive dialogue between representatives from industry, academia and environmental groups. Assuming that through communication the image of the minerals industry in the eyes of the public can eventually be improved, what are some of the other problems and opportunities ahead?

In the most general context, I do not doubt that, no matter what directions are taken by our post industrial society and how far the service sector expands at the expense of the manufacturing sector, the products of the minerals industry will continue to be indispensable to the well-being of mankind. For several decades now, and certainly since the oil shocks of the early 1970s, the intensity of use of most minerals by industry has declined. In other words, the rate of growth of minerals consumption has not matched the rate of growth of the world economy. This phenomenon has been most marked in the industrialized countries but has also, contrary to earlier expectations, played a part in the industrialization of the developing nations. The world-wide availability of new technologies is enabling the developing nations to by-pass traditionally intensive uses of mineral products. For example, copper is no longer an important commodity



in the development of a telecommunications system. But declining intensity of use does not imply the end of growth of demand. World-wide economic growth will continue to more than offset the less intensive application of the products of the minerals industry.

I do not wish to imply that growth of the minerals industry will entail corresponding growth of the industry's work force. In the United States, technological advances are bringing about a more efficient industry, less intensive in the use of human resources. The June issue of the journal *Mining Engineering* was devoted to high-tech surface mining. A series of articles had titles such as "Radio Remote Control Mining," "Computer Applications in the Explosives Industry," "Earth Moving in the Information Age," "Automating Surface Mines," "New Developments in Mining Truck Electronics," "Computers: The Catalyst For Information Accessibility," and "Mining Equipment into the 21st Century." *The Wall Street Journal* recently ran a story on remote control of underground mining by INCO and Noranda. The article concluded that it's just a matter of time before the only people underground will be repairmen.

In 1980, the United States mining industry employed just over a million people. The estimated work force in 1993 was down to 600,000, despite an overall increase in production over that period. In some ways, this technological revolution with its reduced dependence on manpower, is analogous to the industrial revolution of the 19th century. We need to bear in mind that, as our numbers diminish, so will our political clout, which lends urgency to calls for redoubling our efforts to obtain a fair hearing for our industry in Washington. I can say from personal experience that individuals can make a difference in the political process. When I talked about the problems of overproduction of copper by Third World producers, my mind went back to the Kennecott campaign, in the early 1980s, for relief from the subsidization by commercial banks of Third World projects that were made to appear economic only by virtue of such preferential financial support. Legislation we proposed was passed by Congress, over the strenuous objections of the Secretary of the Treasury and other government officials with whom the banks had lobbied heavily. Our lobbying team consisted only of our general counsel and myself, both part-time.

The contention that the world-wide demand for minerals will continue to grow, again raises the question of availability. I have already commented on the effectiveness of minerals exploration over the past couple of decades. Looking to the future, I am encouraged by the spread of exploration from the traditional countries - the United States, Canada, and Australia -

overseas to South America, West Africa and other regions. Not that there is a need to abandon hope of further major discoveries in North America, more specifically, in the United States. Who would have thought, thirty years ago, that exploration in the western states would propel this country from being an insignificant gold producer to becoming the second most important producer in the world? Or that the broad application of solvent extraction-electrowinning would play such an important role in the expansion of copper production? New opportunities may not come easily, but the record teaches that continued effort will again yield the unexpected.

It is, nevertheless, interesting to reflect on the reasons for the current globalization of the search for new sources of minerals. This is by no means an historically unprecedented phenomenon. Impulses that drove explorationists to discover the African Copper Belt, the Bolivian tin province and the gold fields of the Klondike were more remarkable than is the recent surge of exploration in many parts of the world. I believe that attributing today's geographic redistribution of exploration funds to environmental constraints and potential changes of the mining laws in North America does not tell the whole story. At one time, there was a theory that pollution due to mining should be exported to less developed countries whose environmental codes had not yet been promulgated. But most developing countries already have enacted environmental laws that are enforced to varying degrees. When I was involved in planning the Lihir gold project in Papua New Guinea, I found that their environmental laws and regulations were just as exacting as their U.S. equivalents are.

Several magnets are drawing exploration and development funds to Africa and South America. First, many gold and copper producers in North America and Australia have enjoyed several years of profitability and, therefore, have plenty of money to spend on greener pastures. Second, the banking industry tends to follow the herd. Third, increasingly sophisticated geological modeling has defined areas of high potential and narrowed them to manageable targets. And finally, the countries concerned have encouraged exploration by liberalizing taxation regimes and conditions of foreign ownership.

The discriminating audience I have addressed today is well aware of the waves of exploration that have swept over temporarily favorite regions of the world and of the ephemeral nature of political attitudes which can change overnight from benign to hostile. One's admonition has to be, obviously, "go for it" while the opportunity beckons. That, after all, has been the romance and glamour of our industry and will never

cease to attract men and women of courage, vision and adventure.

To conclude, our industry has cured most of its ills that were highlighted by the events of the early sev-

enties. Our heightened attention to the environment should, in time, soften the critical attitude of the public; assuming we succeed, our industry will change and grow in harmony with the evolving aspirations of the world community.

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May 27, 1993

## CONGRESSIONAL RECORD—SENATE

S 6651

## G. FRANK JOKLIK

Mr. HATCH. Madam President, on June 1, a great mining industry leader, G. Frank Joklik, retires as president and chief executive officer of Kennecott Corp. I rise today to salute Mr. Joklik and to thank him for his contributions to the industry and to Utah.

Kennecott is one of the oldest and largest mining companies in the United States, headquartered in Salt Lake City, and one of the premier companies in Utah and in the United States. It has several operations throughout the United States. Many of my colleagues have had the opportunity to meet Frank Joklik during many of his trips to Washington and in recent years at the Senators' Ski Cup in Park City, UT—something he has always supported as a great Utahn.

I would like to take a moment to pay tribute to Frank on his retirement. He is truly one of the most outstanding industry leaders I have had the pleasure to know and work with during the past 17 years. He must be given credit for the rejuvenation of one of Utah's greatest resources, the Bingham Canyon Mine, and for ensuring a financially sound Kennecott, which has benefited not only Utah, but our country as well.

The story of Kennecott's turnaround is the story of an unprecedented revival of a traditional industry. At a time when heavy industry is supposedly on the decline in the United States, Kennecott climbed back from the edge of extinction to become a world leader in mining productivity, cost competitiveness, and environmental protection.

When Frank Joklik became president of Kennecott in 1980, its facilities were aging and production costs were high. At that time, the world copper prices began to decline to historic low levels, and Kennecott's future became uncertain.

Between 1980 and 1989, under Frank Joklik's distinguished leadership, Kennecott increased labor productivity fully 3½ times and cut unit costs of copper production by 75 percent in real terms. Kennecott's Bingham Canyon and concentrating facilities were fully modernized, and the Kennecott mine is now one of the lowest-cost copper producers in the world. Culminating its decade long renewal, Kennecott announced on March 11, 1992, a plan to invest \$880 million to build a new copper smelter and modernized copper refinery in Utah. When construction is completed in 1995, Kennecott's Utah copper operation will be the most technologically advanced and cleanest in the world.

The exceptional Bingham Canyon orebody, a productive work force, and the most technologically modern and environmentally sound facilities, ensure that the Utah copper operation is one of the most competitive copper producers in the world. The Utah property, in combination with Kennecott's other mineral interests, have positioned Kennecott to be financially sound and ensure the livelihood of approximately 7,600 high-quality jobs into the next century.

Mr. President, the Salt Lake Tribune printed an editorial last week that briefly summarizes the accomplishments of Frank Joklik as Kennecott's leader during these difficult times. I ask unanimous consent that this editorial be included in the RECORD at the end of my remarks.

The PRESIDING OFFICER. Without objection, it is so ordered.

(See exhibit 1.)

Mr. HATCH. I wish Frank, and his dear wife, Pam, great happiness as he retires from Kennecott. Knowing Frank as I do, I know he will continue to be actively involved in the Salt Lake community. As a matter of fact, he has already agreed to be the new chairman of the Salt Lake City Olympic Bid Organizing Committee, which is heading up Salt Lake City's effort to host the 2002 winter Olympics. He will continue to be a giant in our city and a strong presence in the affairs of our State.

I pay tribute to G. Frank Joklik as an outstanding individual, as a great mining industry leader, as a servant to the local community, and as one of my true friends.

He is a great man. His wife is a great woman. They both have given a great deal to our great State and to our great city of Salt Lake City. I just want to personally pay this tribute to them at this time, since he retires next Tuesday, and just say my very best to both of them.

I thank the Chair and yield the floor.

## EXHIBIT 1

[From the Salt Lake Tribune, May 23, 1993]  
THE MAN WHO REBUILT KENNECOTT

Though their accomplishments were separated by nearly a century, the names of Daniel G. Jackling and G. Frank Joklik deserve mention in the same breath. The former began open cut copper mining in Bingham Canyon in 1908, and the latter saved that operation from ruin in the 1980s.

So, when Kennecott Corp. announced earlier this year that Mr. Joklik would retire June 1 as the company's president and chief executive officer, observers of Utah business were quick to praise him as the savior of one of the state's most prominent businesses.

For many years, Kennecott was Utah's largest private employer, a titan of the copper industry. But under the heady spell of American affluence following victory in World War II, management and labor began a dance of death. They enhanced compensation at the expense of plant modernization.

By 1980, when Mr. Joklik took over Kennecott's helm, the Utah copper giant was down for the count. Copper prices were low, production costs high, mining and milling operations antiquated.

The new CEO, an old hand who had joined the firm in 1958, took drastic action. He slashed perquisites and "outplaced" hundreds of managers while maintaining production levels. He oversaw the sale of Utah-based Kennecott to Standard Oil of Ohio and its parent, British Petroleum, persuading the new owners to invest \$400 million in a massive modernization effort.

In painful negotiations, he persuaded labor unions to make major wage and benefit concessions in order to foster the modernization. Employment plummeted. It was a bitter pill for many workers, but the operation survived to continue rewarding jobs for those who were able to remain.

Mr. Joklik supervised a subsequent sale to RTZ of London, one of the largest mining concerns in the world. It, in turn, has begun an \$880 million project to bring a new, state-of-the-art smelter on line in 1995.

In short, Mr. Joklik literally has rebuilt Kennecott. Today's company employs only a fraction of the workers of yesteryear, but it is one of the most efficient copper operations in the world, well placed to compete in the world marketplace.

What could have become another rusty relic of American industrial decline has emerged instead as a success story, and O. Frank Joklik deserves much of the credit.

RECEIVED  
JUN 8 1993  
G.F.J.



**Utah State Legislature  
OFFICIAL CITATION  
HONORING G. FRANK JOKLIK**

AN OFFICIAL CITATION OF THE LEGISLATURE OF THE STATE OF UTAH HONORING G. FRANK JOKLIK FOR HIS ILLUSTRIOUS AND EXEMPLARY CAREER IN MINING AND HIS 13 YEARS AS PRESIDENT OF KENNECOTT CORPORATION.

*Be it hereby made known to all by the Utah State Legislature:*

WHEREAS, G. Frank Joklik has served as President of Kennecott Corporation since 1980; and

WHEREAS, during these 13 years Kennecott has undergone its most expansive development since the inception of open pit mining more than 80 years ago; and

WHEREAS, Frank Joklik has guided one of Utah's most vital industries from the darkest days of closure of the Bingham Canyon Mine to the revitalization with modern technology and new facilities; and

WHEREAS, he has also effectively addressed environmental challenges and gained support for financing the largest capital investment ever made in the state of Utah which totals more than \$1 billion; and

WHEREAS, the modernization of Kennecott means continued life for the Bingham Canyon Mine, with its significant jobs, tax base and supply purchases in Utah well into the next century; and

WHEREAS, Frank Joklik has been recognized nationally and internationally for his accomplishments; and

WHEREAS, he has ably served on civic, community and business boards and councils; and

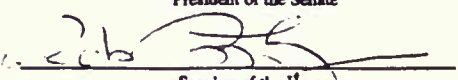
WHEREAS, he has been joined in community service and interest in the betterment of Utah by his wife Pamela; and

WHEREAS, he continues as Chairman of the Salt Lake City Bid Committee for the 2002 Olympic Winter Games:

NOW, THEREFORE, BE IT KNOWN, that the Legislature of the state of Utah honors G. Frank Joklik, on the occasion of his Kennecott retirement June 1, 1993, and recognizes the significance of his mining career, his foresight and determination in bringing this vast mining enterprise into a modernized World Class competitor and for his continued interest in bringing about a successful Salt Lake City bid for the Winter Olympics.

BE IT FURTHER KNOWN that copies of this citation will be sent to G. Frank Joklik and to the Board of Directors of Kennecott Corporation and the Board of Directors of the Salt Lake City Olympic Bid Committee.

\_\_\_\_\_  
President of the Senate

  
\_\_\_\_\_  
Speaker of the House





Michael O. Leavitt  
Governor

## Commendation

Whereas, G. Frank Joklik was born in Vienna, Austria, grew up in Australia, and came to the United States in 1953 as a Fulbright Scholar at Columbia University; and

Whereas, G. Frank Joklik began his career as an exploration geologist with Kennecott Corporation in 1954, and in 1980 became president of Kennecott Corporation; and

Whereas, G. Frank Joklik is an active member of the community, serving on several business and community boards, both locally and nationally, and is an active member of the National Academy of Engineering; and

Whereas, G. Frank Joklik is heavily involved in the effort to bring the Olympic Winter Games to Salt Lake City in 2002, and has put forth incredible time, talent, expertise and resources to further the cause; and

Whereas, G. Frank Joklik, along with his wonderful wife, Pam, have been invaluable assets to our community;

Now, Therefore, I, Michael O. Leavitt, Governor of the State of Utah, do hereby commend and thank

G. Frank Joklik  
"A Giant In Our City"

for his dedication and service to the citizens of the State of Utah, and wish him continued success in all of his endeavors.



Governor: *Michael O. Leavitt*

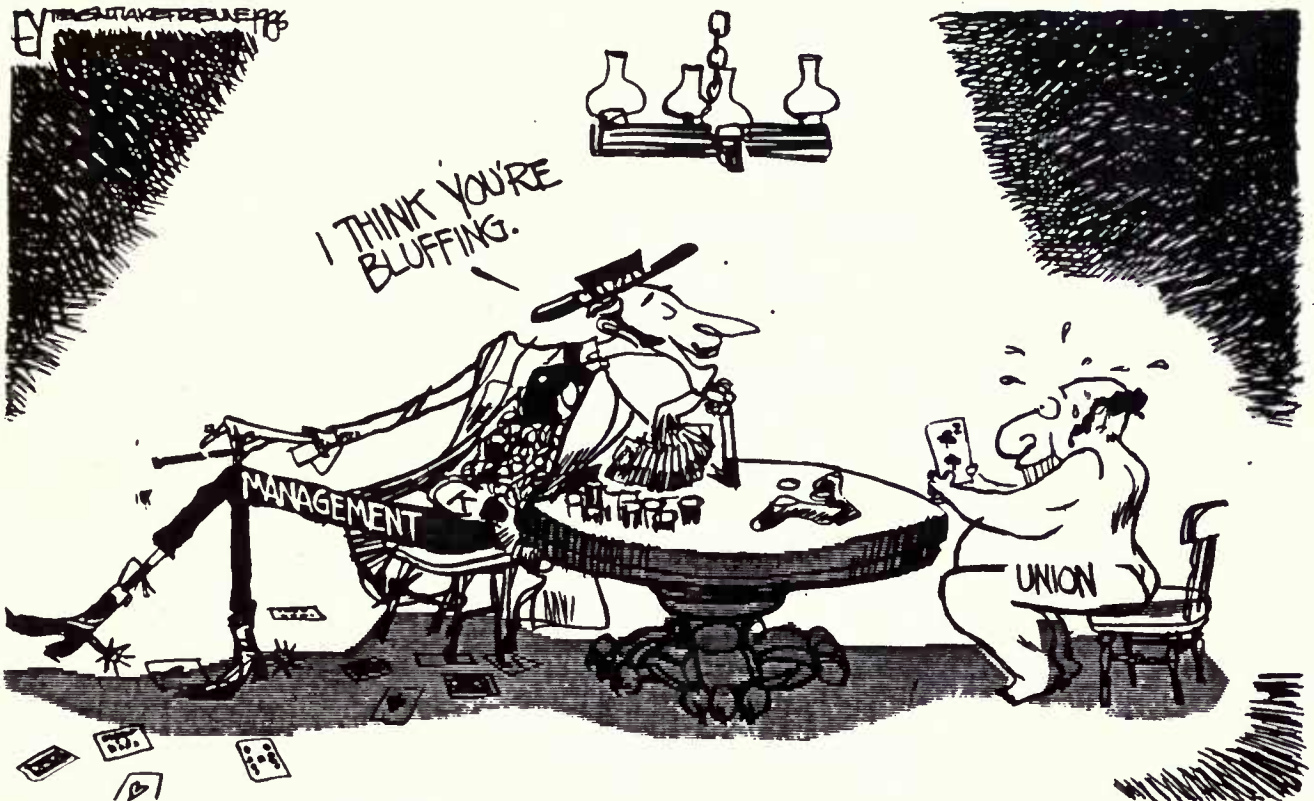


# The Salt Lake Tribune

Tuesday Morning—June 10, 1986

Section A

Page 16



A Friendly Game of Poker at the Kennecott Saloon



# Applications Accepted

**U**tah Copper Division is now accepting applications, *subject to possible future needs*, in all job categories, including production, maintenance and utility jobs. The date of commencement of employment has not yet been ascertained.

Jobs and hourly rates of pay include, but are not limited to:

|                                                                                                   |                        |
|---------------------------------------------------------------------------------------------------|------------------------|
| <b>Lead Craft Workers</b><br>(Electrician, Machinist, Boilermaker-Welder-Layerout)                | <b>\$12.84</b>         |
| <b>Shovel Operator</b><br>(15-yd and larger)                                                      | <b>\$12.84</b>         |
| <b>Craft Workers</b><br>(Journeyman)                                                              | <b>\$10.63-\$11.70</b> |
| <b>Heavy Mobile Equipment Operators</b><br>(Mine Haulage Trucks, Dozers, Large Front-End Loaders) | <b>\$8.75-\$10.63</b>  |
| <b>Process Equipment<br/>Production Operators</b><br>(Furnaceman, Mill Operator)                  | <b>\$7.21-\$11.70</b>  |
| <b>Light Equipment Operators</b><br>(Forklifts, Small Loaders, Service Trucks)                    | <b>\$6.60-\$7.21</b>   |
| <b>Laborers, Helpers and Janitors</b>                                                             | <b>\$5.70-\$6.60</b>   |

In addition to the wages noted above, Kennecott provides a competitive and comprehensive benefits program, including medical, dental, life insurance, pension plan, paid vacation and holidays.

All potential employees must complete an application to be considered for employment. Applications may be obtained from the Utah Copper Human Resources Office at 8362 West 10200 South in Copperton between the hours of 9:00 a.m.-4:00 p.m., Monday through Friday, or by calling (801) 322-7589.

NOTICE TO ALL APPLICANTS: Labor union strike condition may exist.

## Kennecott

*An Equal Opportunity Employer (M/F/V/H)*

# Copper's Future in Utah is in Crisis.

**N**o doubt about it, the domestic copper industry is in crisis.

The United States is using just as much copper as it has in the past. Today, however, more and more of it is coming from Chile, Peru, Zambia and Zaire. These countries can produce copper below the cost of production here in the U.S. despite the fact that domestic producers such as Kennecott have slashed their costs in recent years.

Many U.S. copper mines are closed and most of these will never reopen. If the Utah Copper Division is to be a survivor, it must meet this crisis. We must effectively compete with domestic and foreign producers, even at today's depressed copper prices.

## We Must Have Modernization and Labor Cost Reductions to Meet This Crisis

Kennecott's parent company, Standard Oil, has given the green light to a \$400 million modernization of Utah Copper's facilities. The announcement stressed that the modernization of Utah Copper would continue only if significant labor cost reductions were achieved.

Management has made commitments to help Kennecott survive. In addition to the modernization effort, other operations have been streamlined, and lower costs for energy, equipment and supplies have been negotiated. The staff has been cut and salaries and benefits for salaried employees have been reduced.

Now it is time for Labor to make a commitment to the future of Utah Copper: A commitment to reasonable work practices and a wage and benefit package that makes sense in today's copper market.

Utah Copper jobs are in crisis, but we have an opportunity to survive. Clearly, the choice is in the hands of Kennecott workers. The future of the company as we know it today hangs in the balance.

**We Can...We Will...We Must...**

# Kennecott

Kennecott  
 10 East South Temple  
 P.O. Box 11248  
 Salt Lake City, Utah 84147

# Kennecott

July 2, 1986

To All Represented Employees:

This weekend our nation will celebrate the 100th anniversary of the Statue of Liberty and the rededication of that monument to the ideals and challenges of the future.

Kennecott, although not quite 100 years old, is also in the process of rededication. The Company and all its employees are also faced with these challenges. These challenges are of operation and employment. We want to operate Kennecott and to continue to provide jobs and opportunities for our employees.

The contract upon which you will be voting on July 7, 1986, provides an avenue upon which we can all travel so that we can face these challenges. The contract provides a solid basis for job opportunity and continued income for you and your family.

The reopening of the Utah Copper Division will provide work for employees who have been laid off for many months, and the \$1,000 bonus will be paid to thousands of Kennecott employees upon the ratification of the contract.

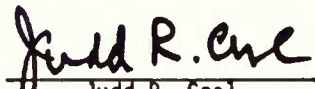
This \$1,000 bonus is "up front." It is not something that may or may not happen in the future. It's money in your hands now!

This weekend (July 4, 1986) as we celebrate the rededication of the Statue of Liberty, let us also celebrate the rededication of Kennecott and its employees to the future of the copper business and to working together to make a better life and community for us all.

We believe it is time to agree that the interests of the Company and its employees are exactly the same. Please vote to ratify, and let's face these challenges together.

Very sincerely yours,

  
 G. Frank Joklik  
 President

  
 Judd R. Cool  
 Sr. Vice President

/bb1



# Modernized Bingham Copper Mine Extends the Vision of D.C. Jackling

By Joe Rolando  
Tribune Business Writer

**COPPERTON** — The completion of Kennecott Utah Copper's \$400 million modernization keeps alive legendary mining engineer D.C. Jackling's 80-year-old vision to engage in large-scale copper mining in nearby Bingham Canyon.

The natural extension of that assessment Friday by G. Frank Joklik, president and chief executive officer of British Petroleum Minerals America, was his observation that the modernization will allow Kennecott to achieve "substantial cost reductions," allowing it "to compete with any [copper producer] in the world."

Kennecott Utah Copper is an operating unit of BP Minerals America.

Mr. Joklik was the first of four speakers at a luncheon ceremony outside Kennecott's new grinding and flotation facility near Copperton marking completion of the modernization program.

Utah Gov. Norm Bangerter also addressed the crowd of several hundred invited guests and cut a ribbon symbolizing completion of the modernization.

The luncheon ended a tour of Kennecott's Bingham Canyon mine and new grinding and flotation facility for the guests.

Among the components of the modernization the guests observed was an Allis-Chalmers gyratory in-pit crusher, which reduces copper ore, delivered by 170- and 200-ton trucks, to 10-inch size or less and delivers it at 900 feet a minute to the new grinding and flotation facility some 5 miles away.

The conveyor, consisting of six belts, moves the ore from the mine pit through a 3.25-mile long tunnel, formerly used by trains, which hauled the ore.

Kennecott spokesman Brian Kammerer, a tour guide on one of the guest buses, noted that the mine's ratio of ore to waste is about 1-to-1. He said that means each day the trucks haul about 77,000 tons of waste to the perimeters of the mine and dump about 77,000 tons of ore into the in-pit crusher.

Mr. Kammerer said Kennecott is still using trains to haul another 30,000 tons of ore from the mine to the two-decade old Bonneville concentrator. Kennecott had planned to close the rail-haul and Bonneville concentrator after the modernization.

But continuing high prices in copper made it expedient to continue

their operation, at least temporarily. Mr. Kammerer said no date has been set for discontinuance of the rail-haul.

Mr. Kammerer said Kennecott is steepening the slopes of the mine to further increase the recovery ratio of ore relative to waste.

Mill concentrate from the grinding and flotation complex goes as a slurry in a six-inch, 17-mile long line to the smelter. The tailings of the flotation are slurried in a 48-inch line to the tailings pond where water is recovered and returned for re-use.

Mr. Joklik said Kennecott's modernization, an extension of Mr. Jackling's vision for the Bingham Canyon Mine, is particularly significant because the engineer's idea was the first application in the world of mining a low-grade ore body in an open-pit profitably. A heroic-size bronze statue of Mr. Jackling stands under the Utah Capitol rotunda.

For Utah, the modernization has significant economic value, said Mr. Joklik. It means Kennecott will be able to continue to provide employment and value to the economy for "another 30 years or longer."

Mr. Joklik said the modernization, which began in February 1986 and took 33 months to complete, was finished on schedule and within budget. He said the construction work force peaked on October 1987 with 1,100 workers.

Some 700,000 engineering man-hours were required to prepare plans for the modernization, said Mr. Joklik. Fabrication, construction and installation took 3 million man-hours, he said.

"The modernization project was conceived in early 1980 at a time when an important change took place at Kennecott, a change of culture," said Mr. Joklik. "There's no denying that prior to 1980 Kennecott was not noted for the efficiency of its operation. Yet, the post war environment had been forgiving in that lucrative metal prices enabled most copper producers to maintain good profit margins while production costs soared."

But he said in the early 1980s world economic growth was slowed by the oil shocks of the late 1970s, and copper demand had been falling below expectations.

At the same time, Third World copper producers in South America and Africa had greatly expanded copper production capacity at government subsidized projects and were not about to be guided by the

laws of supply and demand, said Mr. Joklik.

That, he said, impressed Kennecott with the need to plan for harder times. And the modernization program was just one of the company's major strategies.

Mr. Joklik recognized "the sacrifices" of most of the company's employees and the support from the community from 1980 to 1985 when Kennecott affected significant cost reductions without making capital investments.

"Unfortunately, these achievements were overshadowed by the impact of the collapse of metal prices and the two harshest winters on record," he said. "We had no choice but to shut down the Utah Copper Division."

Both the boards of Standard Oil Co. (Ohio), then Kennecott's parent company, and British Petroleum, which owned 52 percent of SOHIO, approved funding for the modernization in December 1985.

Mr. Joklik said, "Six months later, in July 1986, Kennecott reached another milestone, a new labor agreement with our unions, which permitted resumption of operations."

He said it was because Kennecott's 2,900 union and salaried employees "accomplished the resumption of operations and transition from an old plant to a modernized Utah copper operation in exemplary fashion," that British Petroleum Minerals America Thursday awarded each a \$2,000 bonus.

Patrick J. Gillam, managing director of British Petroleum and the person responsible for the company's international mineral business, called the modernization a "marvelous outcome of effort we have put in investing and managing our work to success. It also says something very important about BP's corporate philosophy: . . . to be in business where we have knowledge and strength and can achieve excellent results and to make our presence heard. That is what modernized Bingham is all about."

Robert B. Horton, managing director of British Petroleum and chairman of BP America, praised the tenacity and intelligence of those instrumental in modernizing Kennecott.

"You notice I haven't mentioned luck," added Mr. Horton. "Much has been said about excellent recovery of copper prices and how fortunate we were with our timing. But I would remind you, 'God helps those who help themselves.' So today BP America is presented not with a bouncing new baby, but rather a . . . brother, who to everybody's surprise, stands



# Kennecott wants to make Lihir profitable

**Billion-dollar gold mining development yielding lower-than-acceptable return**

by FRANK HAFlich

SALT LAKE CITY—Kennecott Corp. faced with a lower-than-acceptable projected return from its proposed Lihir gold development in Papua New Guinea, plans additional feasibility studies to find ways of making the billion-dollar project more economic.

And, despite some international nervousness about political instability in that island nation and current low gold prices, Kennecott remains committed to Lihir.

"It's a huge resource and we are certainly confident of developing it within the next few years," Frank Joklik, president, said here at a briefing last week. Papua New Guinea's prime minister, Rabbie Namaliu, recently visited Salt Lake City and reviewed the project with Kennecott officials.

If Lihir gets the green light, it would mark the return of Kennecott to large-scale international mining development since it ceased to be independent in 1981, when it was acquired by Standard Oil Co. of Ohio. Great Britain's RTZ Corp. Plc took over Kennecott in 1989 when it purchased the BP Minerals group of British Petroleum, which by then had acquired all of Ohio Standard. Kennecott, which is primarily a copper producer, owned the El Teniente

copper mine in Chile until it was nationalized by the Allende government.

Joklik acknowledged, however, that an initial feasibility study on Lihir indicated that while a return on investment is projected, it would fall short of the goals sought by the unit of RTZ, one of the world's largest mining companies.

"There was an ROI demonstrated," Joklik said, describing it only as "modest." Kennecott would "like to see something higher than that," he added.

But Joklik showed little patience for another aspect of the project outsiders might consider an obstacle: Civil unrest in Papua New Guinea that has resulted in the shutdown of Bougainville Copper Co.

"I think we can regard that as a fairly separate issue," Joklik said about Bougainville, whose operator and largest shareholder is coincidentally another RTZ affiliate, 49-percent owned CRA Ltd. of Australia. He emphasized that other companies are continuing to operate natural resource ventures in Papua New Guinea. Local issues affecting Bougainville, he maintained, do "not necessarily throw a cloud of impossibility" over other projects in that country.

Feasibility studies for Lihir have been based on an operation

averaging output of 750,000 troy ounces of gold per year in the first five years of operation. The \$1-billion total capital cost includes mining, processing and ancillary facilities.

Listed reserves for Kennecott's majority share of Lihir, at 12.6 million ounces, are larger even than the 12.5 million ounces listed for Kennecott's main property, the Bingham Canyon copper mine near Salt Lake City.

Kennecott hasn't yet made a formal request to lenders for preliminary loan commitments. This could come in the fourth quarter of next year. Once the mining lease is approved by the Papua New Guinea government, it could be an estimated 26 months before production begins at the site in the northeastern part of the country.

The relatively low cash flow now projected for Lihir explains why Kennecott expects to contribute 40 percent of the project's equity compared with a more conventional 20 to 30 percent, P.J. Bernhisel, vice president of finance and law, said.

But Bernhisel also pointed out that Kennecott is evaluating two aspects of mine operations that could make the project more economic. For one, it is performing additional drilling to identify higher-grade zones that might be mined out in the early phases of operation in order to increase cash flow. He said Lihir's ore body is of a generally uniform grade and it doesn't con-



FRANK JOKLIK

tain a bonafide "high-grade section." By contrast, another gold mine recently started in Papua New Guinea, Placer Development Ltd.'s Porgera operation, does have a distinctly high-grade zone that reportedly is being used to increase initial cash flow.

Moreover, Kennecott is re-examining some potential processing alternatives not considered accessible at the time the first feasibility study was made. One example: Improvements in circulating fluid-bed roasting technology.

Kennecott owns 80 percent of Lihir while Niu Gini Mining, a publically held company based in Sydney, Australia, owns 20

percent, 12 percent of which is carried by Kennecott. The Papua New Guinea government has an option to take up to 30 percent of Lihir, although past projects typically have seen it acquiring about 20 percent. This would leave Kennecott's share at 64 percent.

Joklik pointed out that development of a mine at the Lihir site "presents an engineering and financial challenge." The deposit's large size and advantageous location adjacent to a natural deep-water harbor is offset to some extent by thorny mining and processing problems.

"The deposit contains geothermal water at temperatures in excess of 100 degrees Celsius," Joklik explained. "And the refractory minerals will require capital and operating cost-intensive processes to recover the gold."

To finance Lihir, Kennecott probably will seek project financing through export credit agencies rather than bank loans. Export agencies are eager to assist equipment builders and engineering contractors in their countries and are also more likely to accept a seven- to 10-year mine payback compared with banks, which in general want to see a payback three or so years earlier. Just as important, non-recourse terms after nine completion are more likely to be available from credit agencies, affording some measure of political insurance.

## The Man Who Rebuilt Kennecott

Though their accomplishments were separated by nearly a century, the names of Daniel C. Jackling and G. Frank Joklik deserve mention in the same breath. The former began open cut copper mining in Bingham Canyon in 1906, and the latter saved that operation from ruin in the 1980s.

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What could have become another rusty relic of American industrial decline has emerged instead as a success story, and G. Frank Joklik deserves much of the credit.

FRIDAY, December 2, 1994

## The Salt Lake Tribune

## OUR VIEW

The Salt Lake Tribune's Editorial Position

## The Right Olympic Pitch

Good for Frank Joklik! Finally, somebody has stepped forward and pointed out what should have been obvious: that economic benefit is not the sole, or even the most important, reason for staging the 2002 Winter Olympics in Salt Lake City. No, dollar signs simply cannot measure the most enriching Olympic benefits — those unquantifiable boosts of the human spirit, both for the athletes and their hosts.

This has been lost in the recent din over the Olympics and the supposed erosion of public support for them. The Salt Lake Olympic Bid Committee, which has steered the city into the favorite's position for next June's site selection, has found the noise unsettling enough that it has decided to try to resell Utahns on a sound idea.

So Joklik, the bid committee's chairman, brought the feel-good Olympic message Tuesday to the same Rotary Club podium that Jon Huntsman had used three months earlier to downplay Utah's economic need for the Games. The point of the Olympics, Joklik correctly pointed out, was never just to stimulate a now-prosperous economy; there is so much more to it than that.

Sure, economic concerns are inciting the Olympic naysayers, but the bid committee has gone to enormous lengths in its budgeting to insure that Utah taxpayers are not left with a post-Olympics bill. As Joklik noted, 15 percent of the committee's proposed \$800 million budget is earmarked for contingencies — a cushion against overruns. And that doesn't include Gov. Leavitt's insurance fund, by which any Olympic

overrun would have to reach an unfathomable \$100 million before state taxpayers owe another penny.

Olympic skeptics can express their fears of a budget collapse, but they cannot seriously assail the conservative figures in the bid committee's budget. Nor can they dismiss Joklik's estimates of a \$1.75 billion impact on Utah's economy and \$100 million in state and local revenues, generated by the Olympics.

But it is beyond all these dollar signs that the true impact of the Games resides — in the spirit of Olympism that brings young men and women of different cultures together in the common language and celebration of sport. That may sound tinny in this age of commercialism, but that is still the crux of the Games — the pursuit of excellence by athletes, often against great odds.

The only others whose spirits can soar with the Olympians are their hosts, the members of the community that has welcomed the world into its home for two memorable weeks.

For Salt Lake City, this would be a unique opportunity. It would become the first major American city to stage the Winter Games; indeed, it is the only American city so well-equipped to do it. In a sense, that invests the opportunity with an imperative.

Joklik aptly described the Olympics as "a once-in-a-lifetime opportunity" for the people of Utah. And that is what Utahns must weigh against the nebulous fears of phantom deficits — the opportunity to partake in a united community endeavor that would become a defining moment in the life of this city and this state.



PETE V. DOMENICI  
NEW MEXICO

## United States Senate

WASHINGTON, DC 20510

COMMITTEES:  
BUDGET  
APPROPRIATIONS  
ENERGY AND NATURAL RESOURCES  
AGING

February 2, 1989

Mr. G. F. Joklik  
President BP Minerals America  
10 East South Temple  
P.O. Box 11248  
Salt Lake City, Utah 84147

Dear Frank:

As Chairman of the Senate Copper Caucus, I wish to offer personal congratulations to you as Copper-Man-of-the-Year.

The modernization of the Utah Bingham Canyon operation as one of the world's most efficient copper operations was a noble accomplishment--especially in relation to the dire predictions that were being made about the future of the U.S. copper industry in the early 1980s.

Under your leadership the tough and necessary decisions were made at Bingham Canyon. This operation is now extremely efficient and competes favorably with overseas operations. The modernization at Bingham Canyon well demonstrates what can be done to keep the United States strategically strong.

I join others in recognizing the tremendously successful modernization of Bingham Canyon and your award as Copper-Man-of-the-Year.

Sincerely,



Pete Domenici  
United States Senator



E. J. (JAKE) GARN  
UTAH

SD 505 DIRKSEN SENATE OFFICE BUILDING  
TELEPHONE: 202-224-5444

JEFF M. BINGHAM  
ADMINISTRATIVE ASSISTANT

## United States Senate

WASHINGTON, DC 20510

COMMITTEES:  
APPROPRIATIONS  
BANKING, HOUSING, AND  
URBAN AFFAIRS  
ENERGY AND NATURAL  
RESOURCES  
RULES AND  
ADMINISTRATION

January 25, 1989

Mr. G. F. Joklik, President  
BP Minerals America  
10 East South Temple  
P. O. Box 11248  
Salt Lake City, Utah 84147

Dear Frank:

I don't have to remind you that copper is a tradition in Utah, where families take great pride in having worked at the Bingham Canyon operation. In the past, as well as today, the citizens of Utah depend upon the Kennecott operation for stable employment and a strong economic foundation.

During the early 1980's when a major depression hit the copper industry in Utah and the west, your perseverance, tenacity, and leadership were unfailing. You had the foresight to understand the importance and continuing potential of the Bingham Canyon operation not only to Utah, but the nation as well. When the future of the copper industry in the U.S. was in doubt, you kept faith and led the modernization of Kennecott.

Today, the Utah operation is fully modernized and is one of the world's low cost copper producers. A national asset has been preserved. This world class mineral deposit will now continue to serve the strategic needs of the United States well into the next century.

With this in mind, it is an honor for me, along with the rest of the copper industry, to congratulate you as Copper-Man-of-the-Year!

Sincerely,

  
Jake Garn

JG/rwf

ORRIN G. HATCH  
UTAH

KEVIN S. MCGUINNESS  
ADMINISTRATIVE ASSISTANT

135 RUSSELL SENATE OFFICE BUILDING  
TELEPHONE: (202) 224-5251

**United States Senate**  
WASHINGTON, DC 20510

COMMITTEES:  
LABOR AND HUMAN  
RESOURCES  
JUDICIARY  
INTELLIGENCE  
OFFICE OF TECHNOLOGY  
ASSESSMENT  
SELECT COMMITTEE  
ON SECRET MILITARY  
ASSISTANCE TO IRAN  
AND THE NICARAGUAN  
OPPOSITION

January 26, 1989

Mr. G. F. Joklik  
President  
BP Minerals America  
10 East South Temple  
Post Office Box 11248  
Salt Lake City, Utah 84147

Dear Frank:

I join all members of the Copper Club in congratulating you as Copper Man of the Year. I can think of no one more worthy of this honor.

Your interest in the continued viability of the copper industry, enabling you to bring about a modernization project at the Utah Bingham Canyon Mine in a time of market uncertainty, is a tribute to your leadership.

I have always admired your great courage, vision, and relentless drive to accomplish the goals you have set for yourself and for the industry, and I am pleased to see them formally recognized tonight.

The copper industry and all associated with it are better today because of your tireless efforts.

I applaud your important contributions.

Sincerely,



Orrin G. Hatch  
United States Senator

OGH:smd

MORRIS K. UDALL  
2d DISTRICT OF ARIZONA

235 CANNON HOUSE OFFICE BUILDING  
202/225-4066

CONGRESS OF THE UNITED STATES  
HOUSE OF REPRESENTATIVES  
WASHINGTON, DC 20515

COMMITTEES:  
INTERIOR AND INSULAR AFFAIRS  
CHAIRMAN  
FOREIGN AFFAIRS  
OFFICE OF TECHNOLOGY  
ASSESSMENT

February 1, 1989

Mr. G. F. Joklik  
President  
BP Minerals America  
10 East South Temple  
Post Office Box 11248  
Salt Lake City, UT 84147

Dear Frank:

As Chairman of the House Copper Caucus and a Representative from "The Copper State", I want to personally congratulate you on being selected Copper-Man-of-the-Year!

My Uncle Jesse once said, "If you want to hit a target, you have to shoot straight." Frank, you exemplified this thinking at Bingham Canyon by increasing efficiency, boosting productivity and employing the latest technology all of which made Bingham Canyon one of the low cost copper producers in the world. Your achievement is all the more significant because you avoided government protectionism or other short-term measures when many had lost faith in the future of the industry. You made the difficult but necessary decisions. You shot straight and "hit" the target.

I join your colleagues in the copper industry in congratulating you for being named Copper-Man-of-the-Year.

Sincerely,



Morris K. Udall



STATE OF UTAH  
OFFICE OF THE GOVERNOR  
SALT LAKE CITY  
84114

NORMAN H. BANGERTER  
GOVERNOR

January 31, 1989

Mr. Thomas J. Kennedy  
The Copper Club  
Meeting in Session  
The Waldorf - Astoria Hotel  
New York City, New York

Dear Mr. Kennedy:

News of the selection of Frank Joklik as Copper man of the Year is most welcome news in Utah. Since 1980 when he first came to Kennecott's Bingham Canyon Mine, we have seen the copper industry undergo the most dramatic changes in nearly a century.

We in Utah salute Frank for not giving up in the face of tremendous odds. We salute him for bringing forth the modernization program and gaining the financial support from British Petroleum. Most notably, we salute him for the stability and strength he has brought to Utah's copper mining industry today as well as extending far into the next century.

We congratulate you on your selection.

Sincerely,

*Norman H. Bangerter*  
Norman H. Bangerter  
Governor

NHB/jo





THE SECRETARY OF THE INTERIOR  
WASHINGTON

January 18, 1989

Mr. G. F. Joklik  
President  
BP Minerals America  
10 East South Temple  
Salt Lake City, Utah 84147

Dear Frank:

Let me express my personal congratulations as you receive the Copper-Man-of-the-Year Award.

Over the years you have been a leader in Washington and elsewhere throughout the United States in helping to restore the competitiveness of the U.S. domestic copper industry. This personal effort, in modernizing the largest copper mine in the United States--Utah Bingham Canyon--has created long-term employment for copper workers, and a beneficial tax base for the community. Furthermore, you have helped to keep the United States a major producer of copper.

It was indeed a pleasure working with you in your capacity as a member of the National Strategic Materials and Minerals Advisory Committee. You played an important role, not only in copper, but in other strategic materials issues.

I join all of your colleagues in the copper industry in honoring you on this occasion. Again, my heartfelt congratulations.

Sincerely,



UNITED STATES SENATE  
WASHINGTON, D. C.

ORRIN G. HATCH  
UTAH

May 21, 1993

Mr. Frank Joklik  
Kennecott Corporation  
10 East South Temple  
Salt Lake City, Utah 84147

Dear Frank:

It is a pleasure for me to add a few words to the many accolades I know you are receiving on the occasion of your retirement from Kennecott.

I have enjoyed our past association and appreciated the opportunity to work together with you on many occasions. You have always been able to see a problem clearly and been willing to expend any amount of effort to solve it. I truly admire the great skill and ability that you have exercised for the benefit of both Kennecott and the state of Utah over the years.

Congratulations on this exciting milestone of your career. I am counting on your continuing involvement in the community, and I look forward to a continuing relationship. Elaine and I are grateful for your friendship and extend our very best to you and to Pam.

Warmest personal regards,

A handwritten signature in black ink, appearing to be "Orrin G. Hatch", written over a large, loopy circular flourish.

Orrin G. Hatch  
United States Senator

OGH:rld

ROBERT FOSTER BENNETT

19 May 1993

G. Frank Joklik  
President and Chief Executive Officer  
Kennecott Corporation  
10 East South Temple  
P. O. Box 11248  
Salt Lake City, Utah 84147

Dear Frank:

"The good works that men do will live long after them," to paraphrase Shakespeare, is a description of your stewardship of Kennecott. One of the real pleasures of my run for the Senate has been the opportunity it created for us to get acquainted. As President of one of our state's great companies, you have set an example of enlightened leadership, and I salute you for it; as I thank you for your friendship.

Frank, you have assured the people and the State of Utah, the continuation of a world-renowned enterprise that was faced with extinction. Without your vision of modernization, and the tenacity to see it through, Kennecott likely would not today be producing copper, gold, silver, molybdenum, jobs, and tax payments that benefit all Utahns.

Your commitment to modernize, build and maintain an environmentally-sensitive, integrated copper producer, with mine, smelter and refinery, is a contribution that our children and grandchildren will long enjoy. I appreciate what you have done to revitalize Kennecott. I support what you are doing with your community service, and wish you every success in your future undertakings.

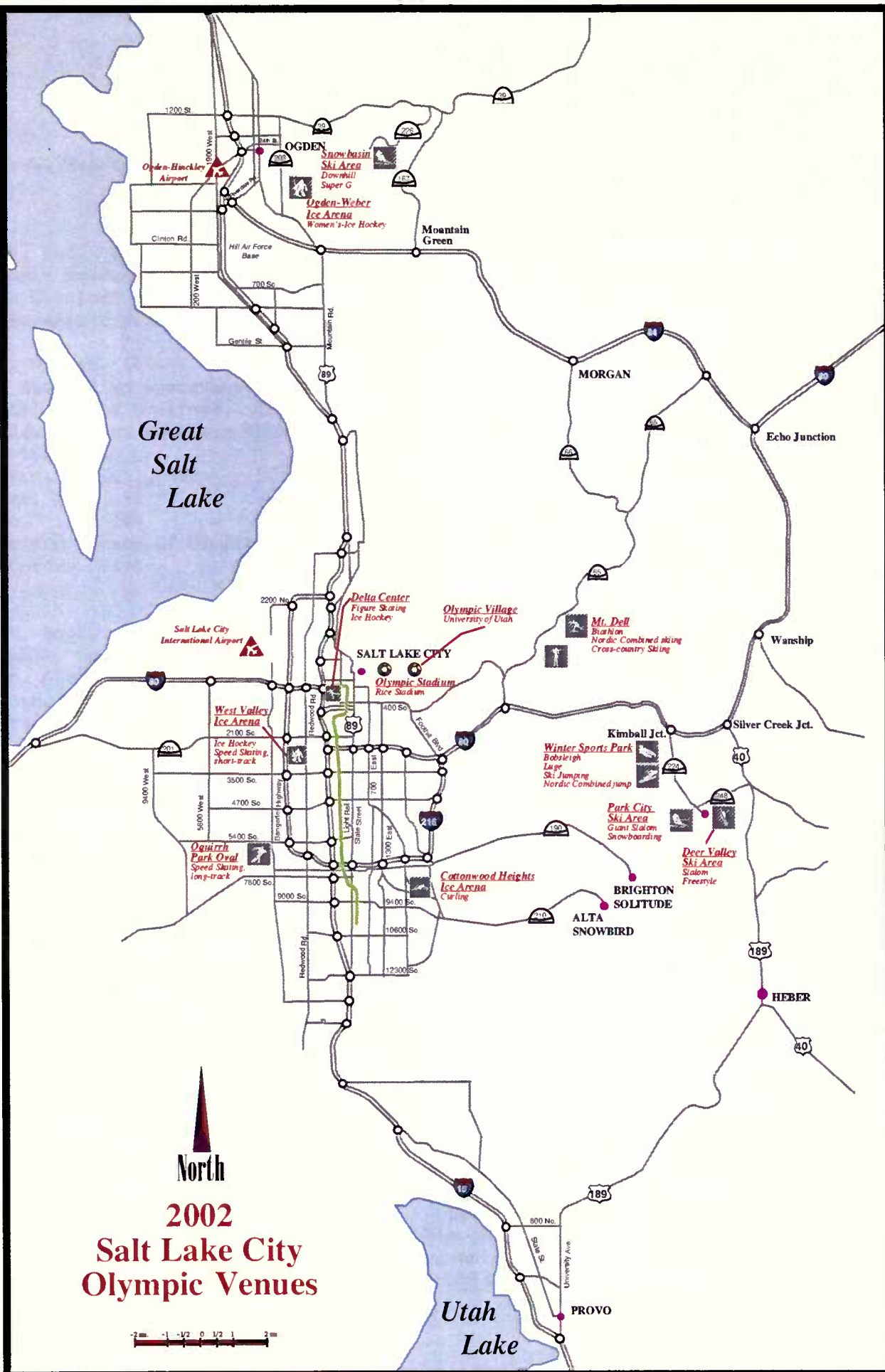
Joyce and I send our personal best wishes for a happy and productive retirement.

Sincerely,



ROBERT F. BENNETT

RFB:rma





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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, 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.