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Yanks and Aussies: A Symbiosis
A Look at Some Illustrative Careers

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Australians and Americans, especially those from the American West, have much in common: among other things, they both superimposed an Anglo-Saxon culture on an indigenous population; they both experimented with transplanting camels to their deserts; they have both caused much consternation by changes made to their common mother tongue. Their mining history for the past century and a half has been intertwined in a symbiotic relationship that has been beneficial to both nations. In 1848 when the California gold rush began, Australians, like those from many other countries, flocked to the Sierra Nevada, a Spanish term, which translates as the Snowy Mountains.

> One of the eleven foreign vessels that sailed into San Francisco Bay on October 6, 1849, came from Sydney, Australia, where the symptoms of gold fever rivaled those in Paris. Throughout Sydney placards and broadsides displayed bold headings: 'Gold. Gold in California!' Newspapers proclaimed 'the extraordinary news.' A shopkeeper in Hobart, Tasmania, offered a new invention called 'California Gold Grease'. If the purchaser covered himself with this grease and rolled down a California hill, only loose gold would adhere to him. The fever spread even more virulently when ships returned to Australia from San Francisco with reports of cargos that had sold for prices beyond belief and of hundreds of people who, penniless a year before, now sported about with fortunes of $10,000.
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> By 1850 in Sydney and other Australian harbors, nearly every ship that could float was undergoing repairs or scheduled to sail for San Francisco. Berths sold quickly, and wharves piled up with barrels of nails, crates of ready-made clothes, bottled beer, woolen blankets, and bricks.[1]

The American version of the history of Ballarat and Bendigo is that the Australians who returned home from California saw similar geographical formations in their home mountains, and the gold rush of 1851 followed. A bit more of American history: the first American president, George Washington, was trained as a surveyor, and Thomas Jefferson, like most of his

peers in the Age of Enlightenment, was well informed in natural science. In the 20th century we had two engineer presidents: Jimmy Carter, from 1977-1981, and from 1929-1933, Herbert Hoover, a graduate of Stanford University in mining engineering. Employed by a London firm, Bewick Moreing, Hoover made his fame and a considerable fortune in Western Australia at the Sons of Gwalia mine.

> Hoover was not the first American engineer in Australia. British investment companies had been importing Americans to Australia for some years prior to 1897, and would continue to do so after he left BMC's employ in 1907. Yet Hoover was surely the most successful … He made no apology for trying to impose an American regime over the international mining industry by importing American personnel and methods to Australia, New Zealand, China, and Burma. While in Australia he was known as "Hail Columbia Hoover" for his preference for American "experts and techniques."
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> Hoover's American biographers … accept the view that he and his fellow Americans were instrumental in shaping an industrial transformation in Australia. Australian nationals, in contrast, argue that Americans did not dominate the Australian mining industry [and] cite counter evidence showing that Hoover had limited knowledge of Australian metallurgical problems, and that many of the major technological advances were led, not by Americans, but by native Australians or by British and Continental engineers and financial leaders. The opening of new goldfields in the undeveloped hinterlands of Australia … triggered a temporary influx of experienced gold miners and managers from the American West. This foreign influence diminished as British nationals gained experience and as more and better regional engineering schools came into being.[2]

I've been talking so far of something that everyone recognizes as History, with a capital H. As an oral historian in California, I am particularly irritated by the notion that history is only in the far distant past, and that mining is something that only happened in the mid-19th century. I have actually been asked whether I have done any oral history with people from the Gold Rush. To date, however, I have not found any interviewees who were alive then. Oral history is based on the assumption that history is happening now, and that it is important to preserve eyewitness accounts of significant events for the benefit of future historians. The Regional Oral History Office at the University of California at Berkeley launched its project in 1985 to document the lives of significant figures in the mining industry. Technological and social changes have taken place in the 20th century, particularly in the last half, which are of great historic importance. Among these are advances in equipment and extractive processes, concern for environmental protection and safety in the workplace, recognition by governments of the strategic

importance of mineral resources, and globalisation in education and finance. Thanks to modern recording devices, we can preserve significant recollections to be invaluable resources for scholars in years to come. We have completed more than sixty volumes of oral histories in the mining series, comprising nearly 100 interviews documenting careers from 1912 to 2004.[3] The faculty advisor for this oral history project is Professor Douglas Fuerstenau, professor of Materials Science at the University of California, and also a member of your Australian Academy of Science. Just last month he delivered the opening plenary lecture on the history of flotation chemistry research at the Flotation Centenary Symposium in Brisbane.

There is much talk today of globalisation, and for some industries this is a new concept, but miners, for all that they work so closely with the terrain, are mobile, and for a very long time have transported their skills and technical innovations from continent to continent. To a high degree they have not carried what some have called 'social baggage', but have used their common background as engineers to override national identities. Let us look at a few of the oral histories[4] which speak of the activities of Yanks and Aussies as they transcend national boundaries in what I call a symbiotic relationship.

James Boyd

One of our first oral histories was of James Boyd, an Australian-turned-American whose remarkable career included achievements in academia, government, and industry. His maternal grandparents, named Cane, lived near Ballarat. James was born in 1904 in Kanowna in Western Australia, where his father Julian Boyd worked as a mining engineer. Julian was wounded at Gallipoli during World War I. James Boyd graduated from California Institute of Technology and received his Doctor of Science degree in geology from the Colorado School of Mines in 1934. He stayed on as professor and later dean. In WWII he served as a colonel in the U.S. Army and was adjutant to General Lucius Clay, directing the reconstruction of German industry. He returned briefly to CSM, and then was appointed Director of the U.S. Bureau of Mines. He left government service for two decades in top-level service to industry, as vice president of Kennecott, and president of Copper Range, and then was called back to Washington as Executive Director of the National Commission on Materials Policy. Australia's loss of James Boyd was certainly America's gain.[5]

John Gustafson

Homestake Mining Company's involvement with mining in Australia was due to geologic work done at Broken Hill in the 1930s for Western Mining Corp. by a young Harvard-trained geologist, John Gustafson. He later became president, CEO, and chairman of Homestake, and in the 1960s led Homestake to form joint ventures in Western Australia at Windaara and Koolanooka. Homestake president Harry Conger's oral history recalls modernizing Kalgoorlie gold mines in the 1970s when the price had dropped. His account may differ from what you have heard from other sources:

> For $3 million cash we took a 42-percent position in this partnership and quickly assessed that the old underground operations - at these gold prices, there was no way they were going to make money; they had to be shut down. So there was a lot of agonizing over that in Kalgoorlie … But after some discussion, that was agreed to be done, with the proviso that when the gold price got above $250, I think it was, we would reopen those old workings. ... They installed a crusher that was on the property somewhere but in such an awkward place that it wasn't useful; they picked that up and put it in a place where it was useful, so the trucking was reduced on surface to get the rock to the plant. Just good stuff. … They really did streamline the handling of the material and materially improved the operation. This all happened with this $3 million that we invested. Well, it's always better to be lucky than smart. Would you not believe that the gold price started to rise? Within several months of having consummated this deal! It became cash positive within two or three months, and so that operation never looked back. As you might expect, our partners Western Mining and KLV said, "You stole this from us. You got this huge position for $3 million. That's terrible." Of course, they're envious that we were able to do that. But you see this plaque here [shows a plaque dated 1984 from the mayors of Boulder and Kalgoorlie, saying "with thanks for saving Kalgoorlie"].[6]

John Turney

John Turney's oral history was recorded as part of a project to document the development of the McLaughlin Mine in northern California in the 1980s. John's family as far back as his great-grandfather was involved in Australian mining. His father graduated in metallurgy from the Bendigo School of Mines; John was born at Mt. Isa, graduated from Monash University, worked in Queensland and then received his Ph.D. at Colorado School of Mines in America. In his oral history he tells how he developed and patented the now widely used process for treatment of refractory gold ores by high-pressure oxidation in an autoclave. In January 1981 the McLaughlin ore body had been

delineated and preliminary drilling had been done. By this time, concern for air quality put severe restrictions on treatment of ores, as Turney's oral history makes clear:

> ... traditionally, what everybody did, if you had a refractory sulfide, you'd put it in a roaster, you'd heat it up, and break down the sulfide with heat, which would then evolve sulfur dioxide, which goes up a stack.

An alternative option was to treat the sulfides under pressure with oxygen, which had been done successfully in a laboratory.

> I think people knew you could do it in a reactor, but whether it was practical, everybody would have said no ... Because the equipment wasn't available to do it. That's really what part of the real story of McLaughlin is about … We were trying to do something that was very radical in the sense that you had 40 percent solids in a reactor, and then you were going to just let this thing down from a high pressure to a low pressure through a valve. Nobody did anything like that. Nobody.

Turney tells this 'real story' of doing research, working without FAX or computer help. He travelled to South Africa, Canada, and Europe in search of ideas, materials, and equipment.

> What we then ended up having to do was, the sizing of the letdown system and the autoclave, basically the thermodynamics, the heats of reaction and that, we did out of the back of the book. We basically pulled out a thermodynamics book and worked out how much heat would be generated, and the calculations that we did based on that theory proved to be fairly close to our numbers that we measured two or three years after startup, where we actually physically measured temperature in and out, worked out heats of reaction, and came up with parameters. Those numbers now have become standard. The industry is using that as a standard number to design these things. We didn't have that. We had to work it out … What we patented was essentially the process, the linking together of pressure oxidation with gold recovery, and the conditions under which you could do that. So it's really the concept; that was what was patented. No physical hardware was ever patented.[7]

Turney's interview is valuable for its clear explanation of the process of technological transfer, from theory to operation, of continuous treatment of an exothermic slurry: modifying the plant to meet changing conditions, and also the challenges of training staff and of meeting concerns of various groups of stakeholders. Others of his associates interviewed in this series have paid tribute to his superb talents as a teacher, trainer, and manager He continues to work with Homestake's successor company, Barrick, as General Manager, Engineering and Development, in Perth.

Alexander 'Bud' Wilson

Another American company with strong ties to Australian mining is Utah, now part of BHP-Billiton. Alexander 'Bud' Wilson's oral history will be a valuable resource for anyone wanting to research this period in Australian history. In 1989, Wilson was awarded the insignia of the Order of Australia by the Australian government for his part in developing the Queensland coal mines. Wilson tells of going to Australia for the first time in 1961 when he was head of the mining division of Utah Mining and Construction Company, and serving on a committee, consisting of representatives of Utah, Cyprus Minerals, and Consolidated Goldfields, putting together a joint venture for the Mt. Goldsworthy mine:

> That committee was a great example of the old saying that a camel is a horse built by committee [laughs], that was fun. And we got it built, in spite of all the stupid arguments that take place over the years. We had to build a railroad, or have a railroad built into the mine. One of the arguments we had was whether to put in bridges over the intermittent stream beds, or as the locals were wont to do, build on the bottom of the stream with the theory that it's easier to reconstruct road or railroad track that's washed out than it is to reconstruct a bridge. We had big arguments about bridges or low-level crossings, we called it. This committee evolved itself into an operating committee, which acted as a board of directors would function. It was a good association--a lot of fun, and that project made money, which helped. All of members of that committee of development and operation were engineers. So, that worked out pretty well.

Wilson tells how Utah's development a few years later of the coal fields in the Bowen Basin very nearly was called off because of the difficulty of treating the metallurgical coal, and makes it clear that metallurgist Charles McArthur saved the day:

> The exploration people became very concerned about the lack of consistency in these coal seams. There was a time when they were almost ready to give up. It was Charlie, really, who developed the plant flow sheets that made it possible to clean up that coal and produce a high quality coking coal. There's a long story behind that, but Charlie went out to Queensland and built and operated a power plant for three months down in a place called Gladstone, to develop the metallurgical systems that we use in a plant to transform that Blackwater coal - medium to low quality coal - to a high quality product. Much of the credit should go to Charlie for having been wise enough to know that there was a way to treat that coal. We rented one room in the offices of our attorneys in Brisbane. It was out of that room that we conducted our negotiations. It was called the Canegrowers' Building. As I recall, it was a three-storied building. In those days, Brisbane was not much of a city. I think the Canegrowers' Building was probably one of the tallest buildings in town - three stories. Now, you wouldn't believe it. There's skyscrapers all over the place.

Figure 1: *The Order of Australia pinned on Alexander M. Wilson, by Governor General, Bill Hayden, on 24 April 1989.*

Source: Courtesy of Regional Oral History Office, The Bancroft Library, University of California, Berkeley

At least part of Brisbane's prosperity resulted from the coalfields development, and Wilson's oral history tells in intimate detail of three years of negotiating - what he called 'badgering - before Queensland's parliament passed an act in December 1968 allowing Utah to open up mines, build the railroad, build a port, and export coal. Some things are similar in every country. He says at one point: 'The Labor Party opposed anything that the government wanted to do, just as goes on in our own congress'. He subsequently became a member of the BHP board and recalls:

> The meetings were fast and furious. I flew to Australia at least once a month. I could do the whole turn-around in five days. That was tough … I learned that the Australians are a lot different from Americans. I don't want to be critical. But an example: the BHP directors were very conscious of their position of being the director of the largest corporation in Australia. They were very conscious of their role in the Australian business community and their role in society.
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> One of the directors was a chairman of a real estate development firm in Sydney. That firm got in trouble; as I recall, the managing director of the firm misspent money, - so there was a great big flap in the newspapers. I received a call in San Francisco from the chairman of BHP … 'Be sure and make the meeting next week, because we have some serious matters to discuss … the matters that they wanted to discuss were should Ogilvie be asked to resign from the BHP board. Well, by golly, …they asked Ogilvie to defend himself; he stood up and said his piece: while he was chairman of the company, he had no knowledge of what this

> fellow was doing and thought it was unjust that he be held responsible. The chairman excused him from the meeting, and the chairman said, 'We shall now vote. An aye vote is to ask Alex to resign. A nay vote is to the contrary'.
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> I was sitting on Balderstone's left. There were twelve of us at the meeting. Balderstone started on his right, and every person voted 'aye' until it got to me, and I voted 'no.' I stood up, and I said, 'I come from an environment in which we believe people innocent until they're proven guilty.' I said, 'We are about to ruin the reputation and the life of a man on newspaper accusations and innuendo. I think it is terribly wrong'. So the chairman said, 'Right-o. Now we'll take another vote'. Everyone voted 'no'.[8]

Paul Schipke

Paul Schipke was mine manager at the Utah Company's San Juan Mine in New Mexico, in the United States, in 1988, when his superior called him in and said,

> 'Paul, they want you to go to Australia. Something's brewing over there … this isn't the army, but you're getting volunteered army style'. … So I said I'd be delighted to go to Australia to work at Mount Newman Mining Company [as manager of the ore processing plant] They were developing a new little iron mine and a new process that was technically fairly challenging. They asked me to go to San Francisco and talk to a few people about the situation. I was told that it's going to be very difficult with labor relations … there was a strategy that had been put together that was not going to work: basically the strategy that had been devised by the general manager of the Newman operations down there, a South African, and he decided that he was going to follow the footsteps of the Robe River dispute … he hadn't done the detail and the preparation … and the whole thing blew up about the time I got there. The unions, all six unions, went on strike. A lot of the problems were they were fighting for turf among themselves. Terrible, terrible labor conditions.
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> For two or three weeks it was chaos. They were firebombing swimming pools, throwing brake fluid on cars, shooting windows out with slingshots – not guns, but slingshots – out of vehicles and some houses. I had a young foreman call me one night and asked me what to do. He says, 'You're my boss; I need some help. I got a bunch of drunk union guys outside my house and they've threatened to break down my door and rape my wife'. I said, 'Well, call the police'. He said, 'Well, I did. The police just asked me if I'm staff or union, and I said I'm staff'. They said, 'You deserve everything that happens to you', and they hung up … I said, 'Get yourself a baseball bat and wait'. A lot of name-calling and threats, but none of them went through the door ….
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> The women in town … made a real effort to keep all of this out of the schools and out of the stores … I think they did a really good job in keeping back all the violence and the ugliness away from the families … the women did have a real calming effect there, but after-hours and on the picket line, it was pretty rough'. That was my welcome to Australia.

His oral history goes on to tell of a good experience at Mt. Newman once the strike was settled, and later when he was working at Kalimantan in Indonesia, he sent crews back to Australia for training, another example of international transfer of skills and knowledge.

> It was a successful exchange program, taking a superintendent of a coal preparation from one of my mines in Indonesia, having him go and work at a similar plant in Australia to see how their work processes were, how they did their maintenance, how they handled their crews, how they did their planning and budgeting. These things were very, very beneficial. They were usually for a two-to-three-month period. When people came back, they all said the light came on, they really see what we were trying to teach them, and they really contributed after that.[9]

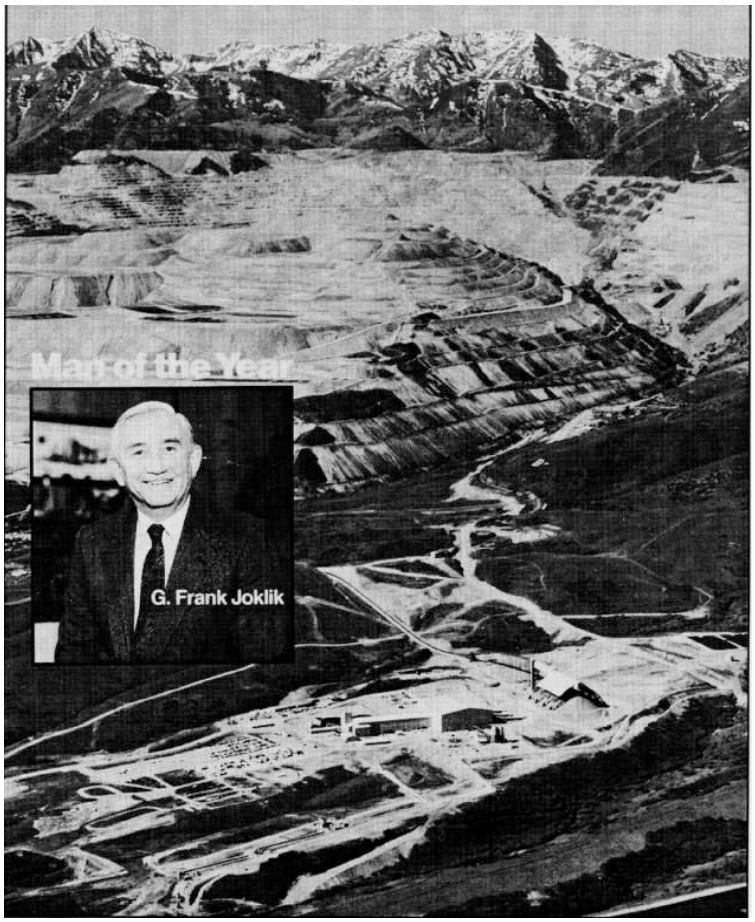
Frank Joklik

Frank Joklik was born in Austria, but spent his formative years in Australia, receiving his Ph.D. in geology from the University of Sydney. He was general manager at Mt. Newman for Amax corporation from 1963-1967, and his oral history gives a detailed account of the development of the geology, challenging the traditional theory of surface enrichment and introducing a concept of deep folding, which led to defining the Mt. Whaleback hematite deposits. His story catches some of the excitement of the mid-1960s when the Japanese market for iron was stimulating exploration in Australia.

> My first trip to Mt. Newman was on the 21st of August, [1963] … There wasn't a single drill hole in this iron ore deposit … 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 …. 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.[10]

Frank Joklik went on to later success in the United States, applying the talents he had developed in Australia to the massive challenge of modernizing Kennecott's Bingham Pit Mine and Copperton smelter in Utah. He was named Copper Man of the Year for these achievements.

Figure 2: *Frank Joklik.*



Source: Courtesy of Regional Oral History Office, The Bancroft Library, University of California, Berkeley

Roy Woodall

As historians we are interested in the big changes in mining in the past 50 years or so: in more efficient equipment and processes, in concern for the environment and worker health and safety, and high-tech and scientific methods of exploration. A fine illustration of application of modern science to mineral exploration comes from our most recent oral history, which is yet to be completed, with geologist Roy Woodall, graduate of the University of Western Australia. He completed the Master of Science degree at the University of California and was told by his advisor, 'Go back to Australia. We cannot teach you much more. Go and apply what you have learnt to find ore deposits'. Undoubtedly you all know of his stunning success in locating significant mineral deposits: bauxite in Western Australia, nickel at Kambalda, uranium at Yeelirrie, and the Olympic Dam Mine, a copper-uranium-gold deposit. His detailed accounts of these efforts will be a treasure trove for future historians. The story of

Kambalda in the 1960s includes the new element of care for the environment, far in advance of this concern generally.

> We developed a town site at Kambalda where you could be dismissed from employment if you removed any natural vegetation higher than about three or four feet without the resident manager's permission. All our car parks had to be established without the removal of any trees. This was long before there was any pressure on mining companies to be environmentally responsible. It is still a beautiful, leafy, if somewhat arid mining town.

Figure 3: *Roy Woodall*.

Source: Courtesy of Regional Oral History Office, The Bancroft Library, University of California, Berkeley

Throughout his oral history, Roy Woodall emphasizes the importance of establishing trust all up and down the chain of command from top executives to workers. This is his account of the initial drilling at Olympic Dam and how important it was that his superiors trusted in him:

> The first hole … thirty-eight meters with one percent copper. It almost missed the ore body … The second hole was on another target … It was barren. The

> third hole was barren. The fourth hole … was also barren. The fifth hole had a similar width but low grade. One percent copper under 1,000 feet of cover was not economic. I bet nine companies out of ten would have stopped … It is costing about a hundred thousand dollars to drill each hole … So how important confidence is between the board, the managing director, and us guys drilling expensive holes out in the desert where you can't even see anything but sand dunes and getting such poor results. It got worse. The sixth hole was barren. The seventh hole was barren. The eighth hole had a measly 14 meters at 1.2 percent copper. The ninth hole was worse. The tenth hole, 170 meters of 2.1 percent copper with a very significant uranium bonus and a gold bonus! … This is the best example you will ever see of the problem of exploring for concealed ore bodies when you have got 1,000 feet of barren rock on top. Now, there is no doubt in my mind that in the United States and Canada and Australia there are great ore bodies, but once they get covered up by six sequences of barren rock, they are jolly hard to find.

Jolly hard, indeed!

Conclusion

So – mining history is being made even now. Miners work at one of mankind's oldest enterprises, and at the same time, as nations today become ever more interdependent, miners foreshadow the future when materials, ideas, and technology will be shared across national boundaries. Thus in looking at the oral histories of Australian and American mining men I believe we can appropriately use the word symbiosis, which according to Webster's dictionary means, 'The living together in intimate association or even close union of two dissimilar organisms ... used of cases where the association is advantageous, or often necessary, to one or both, and not harmful to either'.

Endnotes

[1] James Holliday, *Rush for Riches*, Oakland Museum of California and the University of California Press, 1999, p. 92.
[2] Ron Limbaugh, 'Pragmatic Professional', *Mining History Association Journal*, 2004, pp. 48f, 55.
[3] An increasing number of the oral histories are available online, and all of them are available as bound volumes at cost for anyone who is interested. Our web site address is: http://bancroft.berkeley.edu/ROHO/collections/subjectarea/natres/mining_western.html
[4] The following citations are from the Western Mining series, Regional Oral History Office, University of California, Berkeley:
[5] James Boyd, *Minerals and Critical Materials Management: Military and Government Administrator and Mining Executive, 1941-1987*, 1988, 253 pp.
[6] Harry M. Conger, *Mining Career with ASARCO, Kaiser Steel, Consolidated Coal, Homestake, 1955-1995: Junior Engineer to Chairman of the Board*, 2001, 324 pp.
[7] John Turney, 'McLaughlin Metallurgist: Pioneering Autoclaving for Gold', in *The Knoxville Mining District, The McLaughlin Gold Mine, Northern California,* vol. VII, 20012, 560 pp.
[8] Paul Schipke, *Mining and Environmental Engineer for Utah-BHP Company, 1972 - 1997*, 2004.
[9] Frank Joklik, *Exploration Geologist, Developer of Mt. Newman Mine, President and CEO of Kennecott, 1949-1996; Chairman, 2002 Olympic Winter Games Committee,* 1997, 395 pp.
[10] Roy Woodall, exploration geologist, oral history in process, 2005.