

JOHN C. GREENWAY, THE AJO EXPERIENCE

by H. Mason Coggin
Continued from Issue 1

Again writing to George A. Newett, Greenway describes the progress of the railroad.³³

The Ajo work is developing finely. Rate agreements with the Southern Pacific and El Paso & Southwestern Companies have been signed up. Permanent location of the railroad has been made and the work is now open for examination by contractors and we expect to award the contract about the middle of June. The road will cost approximately \$700,000.00 to complete. There is no gradient in the line from Gila out 36 miles that is over 1/2 of 1% and no curves of 3 degrees. From this point back to Gila there are no adverse grades, all grades being either level or minus. From the 35 mile post into Ajo, there is a gradient of approximately 1.25 percent. Rail heads should reach Ajo, if our plans carry, sometime in January.

I also hope to be able to have material for construction of the plant ready for delivery into Ajo when the road is ready for transportation in order that there should be no break between the completion of the road and starting of construction work.

We have not been able to develop the results in the 40-ton plant that we have gotten in the 1-ton plant, but the work is improving right along and Ricketts and I consider the process is in satisfactory shape.

Including the town, the railroad and the extensive water development plant, the overall cost of the development was estimated at \$7 million. Opposition to this large sum among the directors of the NCCC continued. They felt that it was too much to spend on a property that still seemed unproven. Some of the directors felt the townsite was an unnecessary luxury. Their reluctance forced Greenway to secure every dollar under

criticism. Earlier opinions that the Ajo ores could not be profitably handled were brought up and rehashed at the Board meetings.³⁴ Newett, in a letter to Greenway,³⁵ says, "I was very glad C&A directors decided on \$1.25 (dividend) as it is saving a lot of criticism. Most holders of the stock do not realize just what is being done for them at New Cornelia and other places."



AJO STATION c. 1917. Rail transportation was the best way to transport materials and supplies when the Tucson, Cornelia, and Gila Bend Railroad established this essential link between Ajo and the Southern Pacific Railroad at Gila Bend. Photo from George A. Newett.

Although beset with these difficulties, Greenway allowed no pause in his planning. If the project had not been struck by the Industrial Workers of World (IWW) near the end of construction, it would have been finished in April, three months ahead of schedule. As it was, they were delayed until May 1 leaving two full months before the promised July 1917 target date.³⁶ During this period, Greenway was traveling around the country inspecting and purchasing equipment for the project.³⁷

One of the financing techniques used by the C&A to fund this operation was the issue of \$4 million of sinking fund gold bonds at 6% convertible for \$10.00 per share. The C&A bought \$3.1 million of these bonds as soon as they were issued.³⁸ The remaining bonds were immediately picked up by the Directors and Officers of the C&A and the NCCC. The El Paso and Southwestern, who provided at least some of the funding and a great deal of expertise helped out with the costs and construction of the railroad.



EARLY AJO HOUSING, c. 1917. The tent house on the left was typical of about 50% of the housing in Arizona at the turn of the century. One of the NCCC's first activities was to provide adequate housing for all of its employees. In spite of the best efforts of the company some of these tent houses remained in Ajo until the late 1940's. M. Curley School in the background. Photo from George A. Newett.

During the middle of construction, and again at the end, the C&A Board of Directors toured Ajo to view the progress. Several photographs taken by George A. Newett, a director of the company, are attached.

Three Osgood steam shovels and 36 twenty-cubic-yard side dump railroad cars were delivered to Ajo as soon as the rail was completed. The equipment for crushing, leaching, and acid storage, the electrolytic tank house, power plant and other facilities were soon delivered to the camp.³⁹ With the new equipment on hand the plant was quickly completed.



VAT LEACHING, c. 1917. These are the vat leaching tanks that the NCCC constructed to hold the broken oxide ores while they were being leached. Photo from George A. Newett.

From the May 1, 1917 start-up until the end of the year, net profit from the operation reached \$760,000. The first 53,000 tons of ore averaged 1.58% copper. Reserves at year end stood at 30

million tons of oxide carrying 1.83% copper. Thirty-nine million tons of sulfides grading 1.75% copper had also been developed. The company began testing a flotation process for these ores the following year.

Just as the plant was starting, the U.S. declared war on Germany. Fiercely patriotic, Greenway joined the military, where his record during the next year was exemplary. He went into the Army as a major in the Corps of Engineers.

A large gathering of his friends organized a departure party in Bisbee before Greenway left for Europe. At that all-day community celebration, he described the vital need for copper in the war efforts of the United States and its allies.⁴⁰ During his service he was honored and decorated several times for heroic episodes by both the US and French governments. After the Treaty of Versailles he left France a brevetted General.

The Armistice created a copper glut and during the next year a large surplus of copper was stockpiled by producers. In the face of this surplus, Greenway was still able to convince the NCCC to install a second pump and start a 500-ton-per-day flotation pilot plant to test the sulfide ores.⁴¹



AJO HOUSES, c. 1920 This image of the Ajo housing was made by George A. Newett during a New Cornelia Copper Company Board of Directors meeting at the mine some time in the early 1920's. Apparently these are duplex houses in what was called Mexican town. Photo from George A. Newett.

The flotation process at that time had become the most accepted form of copper sulfide concentration from low-grade sulfide ores. It was developed after a woman who washed miners' clothes noticed that the soap bubbles would attract and hold the copper sulfide minerals. In this process the ore is crushed and ground to the con-

sistency of corn meal, mixed with water, oil and soap, and then subjected to a bubbling action. The sulfide minerals attach themselves to the bubbles and are brought to the top of the solution where they are skimmed off and the minerals collected. Thickened and filtered, this sulfide pulp is sent to the smelter where the sulfur is burned off and other impurities removed by fluxing. The resulting copper matt is first reduced to an oxide by introducing oxygen, and then the oxygen is removed by poling the mixture with green logs.



START OF MINING c. 1917. As soon as the railroad started bringing in the equipment the mining operation started. Photo from George A. Newett.

In spite of the recession and depressed copper market, the NCCC continued to build and improve the townsite and the community of Ajo. In 1918, the company built sixteen new houses for employees, installed a ten-ton-per-day ice plant and operated the New Cornelia Mercantile Company on a competitive basis. The community, like most southwestern towns, was segregated with Mexicans living in Mexican Town, Indians living in Indian Town and Whites living in Ajo. The squalid conditions of Mexican Town were so bad that the company made this the first segment of the population to receive new housing. Most of these homes were of the duplex type and housed two families. The anglo community in Ajo was the last to be rebuilt. Ajo families still lived in tent houses through World War Two.

The NCCC encouraged alternative stores to the co-operative and even provided them with incentives to enter the community. These incentives included reasonable rental rates and cheap utilities. The biggest advantage of the co-operative was a 15% profit refund made to employee customers in time for Christmas shopping.⁴² Studies by the company showed that

76% of the employees shopped at the cooperative, and, although prices were slightly higher, the quality was above standard.



AGUA CALIENTE SPRINGS OF ARIZONA, c. 1920. This is the stop on the Southern Pacific Railroad where the passengers to Ajo left the railroad to travel by motor car or wagon to Ajo. This photograph taken in the early 1920's shows the motorcars being readied for the two day trip. Photo from George A. Newett.

Early in the development of the town the company planned a plaza surrounded by trees, a gazebo and grass. A virtual oasis in the desert, it provided a well shaded area for picnics and parties. Stores, a theater, the TC&GB terminal and churches lined the plaza. To make life more enjoyable, the company built a large swimming pool for **ALL** of its employees as soon as the mine was on a stable and paying platform. During the summer of 1921 this pool served 11,647 customers and 48 people learned to swim.⁴³ The paved streets of Ajo radiated from the plaza. In the first blocks they planned a Christian church and a Catholic mission. Partially completed in 1921, these served a community of 747 employees, including 442 of European or American extraction, 297 Mexican or Indians and eight blacks. Ajo was on par socially with other Southwestern American towns and mining camps.⁴⁴

Ajo was first and alone in developing a leaching operation for its oxide copper ores, and first to resolve the electrowinning problems in recovering a directly marketable product. Economically, this mine made a substantial impact on Pima County. In 1919 it paid about 40% of the Pima County taxes, or about \$1.85 per man-shift. The average wage paid to workers at the mine was about \$5.90 per day.⁴⁵

Greenway began pushing the company to

build a sulfide mill in 1920 to accommodate the increasing sulfide ores. He received approval in 1922 and began to design a mill with a flotation capacity of 5000 tons per day. The new mill would require additional water, and the company immediately started its second water shaft, with a planned depth of 656 feet. Drifts into the aquifer would be driven horizontally from the bottom of the shaft to provide additional water flow to the pumping plant. The water requirement for the new mill was anticipated at 4,000 gallons per minute. Although this volume would not be considered large by Salt River Valley farmers' standards, it was a large volume to extract from the gravels that the NCCC had located several years earlier.



HOTEL CORNELIA. Was deserted and windows boarded over when the author took this picture in January of 1994.

Additional locomotives, dump cars and steam shovel equipment would be required to move the planned 5,000 tons of ore per day to the new sulfide mill. The deepening mine needed more track to reach the ore faces and more time per trip to spiral the ore from the mine to the mill on the 4% grades that still restrict rail traffic.

At year-end 1922, the NCCC was back to being a healthy cash-winning subsidiary of the C&A from the continued production of copper from oxide operation.⁴⁶

As the sulfide concentrator neared completion in 1923, the attention to planning for corporate success continued, as only three years of leach reserves remained and a smooth transition would be required to keep this subsidiary solidly in the black.

Two new shovels, three locomotives and 20 railroad cars prepared for assault on the sulfide ores. As a part of the scheme to switch over to sulfide ores, the mine planned to start roasting their own ores for the sulfur gas that it used to reduce the iron in its now famous process.



THE PLAZA, c. 1923. Complete with Flag pole, it was the only grassy plot of ground in the 300 miles between Tucson and Yuma. Photo from George A. Newett.

After a slow start the Ajo flotation mill operated at 50% capacity during 1924, when it treated 1.8 million tons of sulfide ore and leached 1.2 million tons of oxides. The expansion was completed and Ajo increased production to nearly 64 million pounds of copper.⁴⁷

With this increase in copper production, NCCC got a substantial boost in earnings and income. On assets of \$33 million and through sales of nearly \$9 million, the company was able to hold an operation profit of just under \$3 million dollars. They paid out \$675,000 in dividends and produced nearly 64 million pounds of copper. As a bonus, the flotation of the sulfide minerals also recovered 106,000 ounces of silver and 10,675 ounces of gold. This precious metal aspect at Ajo remained an important contributor to Ajo's production throughout its operation lifetime.

The NCCC continued to improve the condition in the townsite. Through generous donations which were matched by contributions from the community, the Ajo Federated Church was completed early in 1926. The Catholic Mission had already been dedicated on Thanksgiving Day, 1925, in an all-day ceremony of prayer and thanksgiving.⁴⁸

The NCCC organized, funded and then transferred title to their utility to the Ajo Improvement Co. in 1925 to provide lights and water to the community.

Continued exploration and blocking out of new reserves was successful, and at the end of

1925 reserves stood at 54 million tons, with an average grade of 1.41% copper as sulfides. The oxides dwindled to just slightly over 3 million tons averaging 1.25% copper.



GREENWAY HOME IN AJO. When this picture was taken the new owners of the home were planning on turning it into a bed and breakfast for tourists. Photo by author 1994.

John C. Greenway resigned as General Manager of the Calumet and Arizona Mining Company on June 20, 1925. For years a rift had been developing between Greenway, the president of the C&A, and several of the directors over a commitment that Greenway made regarding a small mine in New Mexico. The C&A acquired the 85 Mine, located about five miles south of Lordsburg, New Mexico, to provide flux for the Douglas smelter. Greenway made a verbal commitment during the negotiation to provide the former owner with 9,000 tons of ore from the mine. After reviewing the contract, the C&A attorney observed that the contract was not binding and they did not need to honor Greenway's commitment. Greenway claimed that it was a moral obligation and that the company should deliver the 9,000 tons to Doer and his Kansas City Smelting and Refining Company. After several letters and telegrams, Greenway submitted his resignation.⁴⁹ The other officers and directors apparently convinced Greenway to stay on board, but the rift had already started and Greenway had his own programs, including politics, dam building and developing new mines. His untimely demise ended these plans.

Perhaps the real reason for Greenway's resignation can be found in a letter from Gordon R. Campbell's to Harry A. Clark of May 23, 1925, wherein he says:

*My dear Harry:
When I arrived at Arizona early in
April, Mr. Greenway handed me a let-*

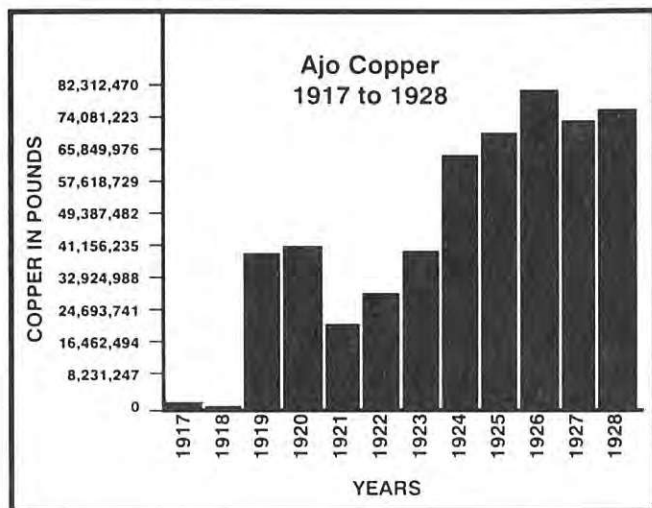
ter which, much to my surprise, proved to be a tender of his resignation as general manager of Calumet & Arizona Mining Company and of New Cornelia Copper Company. He asked that it be presented to the directors immediately and this was done at our meeting at Ajo. It was considered advisable to defer action for the reasons that several directors were not present and that we might have opportunity to consider and formulate our policy as the result of his resignation.

After very careful consideration and after canvassing the whole situation, it was the opinion of every member of the board of directors and it was therefore unanimously agreed that the resignation of the general manager should be accepted, effective June 30 next, and that no general manager should be appointed to succeed him for the present.

By the same unanimous judgment it was agreed that you should be made "manager"? Of Calumet & Arizona Mining Company proper; that E.E. Whiteley should be made "assistant manager;" and that M. Curley should be named as manager of New Cornelia Copper Company.⁵⁰

Interpretation of this letter at this late date is difficult. In the preceding years Greenway had been elected to the Board of Directors for the corporation but was not made its president. There have been other recent changes in the corporate structure, and perhaps he was disappointed in not being promoted. At any rate they did not replace him as General Manager but created other positions that were more subordinate to the President and the Board.

Greenway alone was responsible for the C&A's involvement in Ajo. He had pushed a reluctant corporation into acquiring the property and he had succeeded where other noted mine operators had failed. He made the mine a technical and financial success in the face of their stated doubts. It was his imagination, his leadership and most of all his perseverance that made Ajo successful. This success can be seen by graphing Ajo's copper production from 1917 to 1928:



In spite of Greenway's early demise, Ajo would continue to produce great quantities of copper for the New Cornelia Copper Company and the Calumet and Arizona until that company's merger with Phelps Dodge during the great depression of the 1930's. Operations would be suspended for a few short years in the mid-30's only to be restarted, rebuilt and revamped to one of the primary sources of revenue for Phelps Dodge and one of the all time great copper producers for the United States.

EXHUMATION AND REINTERMENT

As a post script, Jack Greenway, who was born two years before the general's death, was raised by his mother at the Arizona Inn in Tucson. He was never involved in the mining industry, and his ties to his family reach back to his mother's ancestral home in Virginia. Jack has provisions in his will to be buried with his mother in the family vault in Virginia. He has also provided that his father be removed from his Ajo vault to join them there. When that happens Arizona will lose the last sad remains of one of its most important pioneer developers.

It is doubtful that any monument to General Greenway could be built over his grave in Kentucky that would be as meaningful, dramatic or as appropriate as his Ajo Open-Pit copper mine. Perhaps some future generation will recognize his contribution to the development of Arizona and build a great monument to John C. Greenway at the open-pit overlook.⁵¹

33. Greenway, John C., *Letter to George A. Newett*, June 2, 1915, letter in possession of author.
34. Watkins, Robert A., John C. Greenway, *Arizona Mining Journal*, Oct. 1917, pgs. 1-3.
35. Newett, George A., *Letter to John C. Greenway*, Dec. 13, 1915, in author's possession.
36. Watkins, Robert A., John C. Greenway, *Arizona Mining Journal*, Oct. 1917, pgs. 1-3.
37. Greenway, John C., *Letter to George A. Newett*, March 25, 1916, in author's possession.
38. *C & A Annual Report to Stockholders 1916*
39. *C & A Annual Report to Stockholders 1916*
40. Wathins, Robert A., John C. Greenway, *Arizona Mining Journal*, Oct. 1917, pgs. 1-3
41. *New Cornelia, Annual Report to Stockholders 1918.*
42. *New Cornelia, Annual Report to Stockholders 1918.*
43. *New Cornelia, Annual Report to Stockholders 1921.*
44. *New Cornelia, Annual Report to Stockholders 1924.*
45. *New Cornelia, Annual Report to Stockholders 1920.*
46. *New Cornelia, Annual Report to Stockholders 1922.*
47. *New Cornelia, Annual Report to Stockholders 1924.*
48. *New Cornelia, Annual Report to Stockholders 1925.*
49. John C. Greenway, *letter to Mr. Kuno Doerr*, July 12, 1920. The Greenway Collection Arizona Historical Society, Tucson, Arizona, 85 Mine folder.
Mr. Charles Briggs, *letter to John C. Greenway*, July 12, 1920, The Greenway Collection Arizona Historical Society, Tucson, Arizona, 85 Mine folder.
John C. Greenway, *letter to Mr. Charles Briggs*, August 7, 1920. The Greenway Collection Arizona Historical Society, Tucson, Arizona, 85 Mine folder.
John C. Greenway, *letter to Mr. Charles Briggs*, August 13, 1920, The Greenway Collection Arizona Historical Society, Tucson, Arizona, 85 Mine folder.
50. Gordon R. Campbell, president of the C & A, *letter to Mr. Harry Clark*, about to be manager of the C&A, May 23, 1925, copy of letter in author's possession.
51. John Campbell Greenway has left Ajo for the last time. *Ajo Copper News*, Ajo, AZ, Nov. 8, 1995. ✕



Artwork from the Manhattan Cowboy Mining Company Stock Certificate, Circa 1906.