

# ROOTS OF THE CALUMET AND ARIZONA

## A Short History of the Calumet and Arizona Company

by H. Mason Coggin, PE & LS

### INTRODUCTION

*Me Pard was a fellow called Tony-  
A likeable chap all-around,  
A good one for drillin', hand-blastin'-  
A fair one, at catchin' hup ground.*

*'E' 'ated those chaps they called Texans,  
'E' 'adn't no use for a Finn,  
The Swedes, the Bohunks and Mexicans  
'E' 'ated them creatures like sin.*

*'E said it was God made the Dagoes-  
The Devil, e' said, made the Dutch,  
But oo' ever hit was made the Cousin Jack  
'E reckinned, 'e didn't make much.*

*(Ned White)<sup>1</sup>*

Of all of the ethnic groups that poured into Bisbee, Arizona at the turn of the century it was the Cornish Miner or Cousin Jack who brought the technology that allowed the camp to become a large industrial complex during the first half of this century.



Figure 1. Bisbee Downtown, 1899

*This is approximately how Bisbee looked at the time the directors of the Lake Superior & Western Exploration Company entered the district. The Copper Queen smelter can be seen making smoke in the bottom of Tombstone Canyon. Beyond the smelter stacks and just to the right the Copper Queen's Czar and Spray shafts can be seen. The C&A's initial location in the district was just beyond this property.<sup>28</sup>*

Bisbee is at once both quaint and beautiful. Its reason for being is the rich deposits of copper, gold and silver that once underlay its rugged limestone surface. Over a century of copper production from this camp produced enough copper to build a belt for the world sixteen inches wide and one inch thick.<sup>2</sup> Since discovery in the 1870's the history of the camp has been well documented. The tradition of mineral production was the result of the great economic genius of several people and the persistence of many hard rock miners.

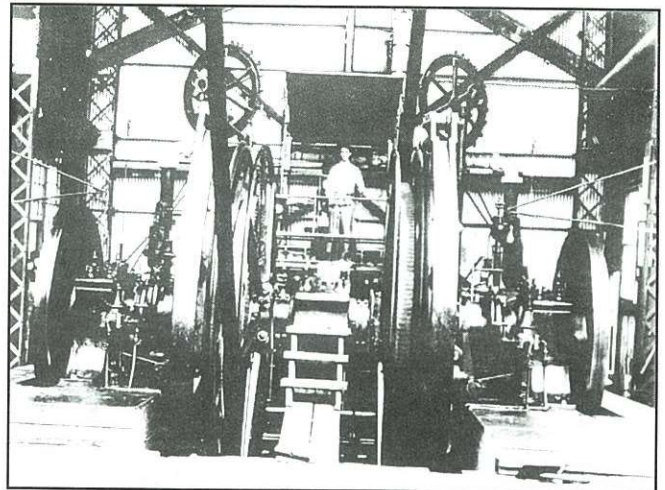


Figure 2. Spray Shaft Hoist, 1902

*This hoist allowed the Spray Shaft to be sunk to a depth of 1060 feet. It was started about 1889 by the Holbrook and Cave Mining Company and turned over to the Copper Queen in 1892. At that time no ore had been found in the mine. By 1894 it had become a major producer and impressive orebodies had been developed to the east of the shaft. It was these deposits that inspired the Hoatson's to take Graham's advice to purchase the Irish Mag. The ore reserves of the Spray were essentially depleted by 1913. The shaft site was covered by the waste from the Lavender pit dumps in 1968.*

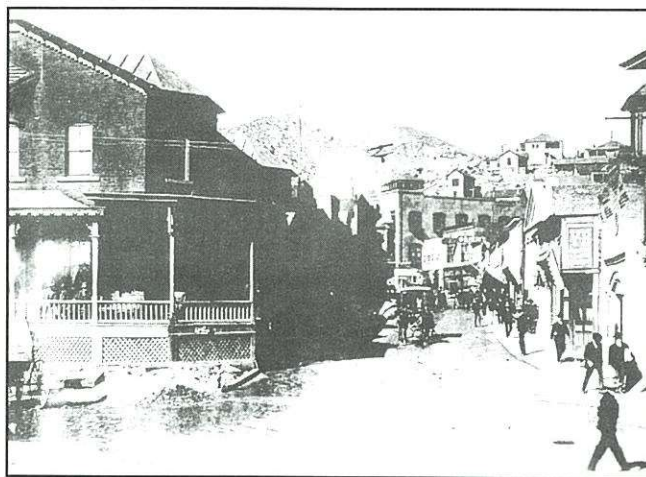
A question often asked by historians is, "Did James Douglas make Bisbee or was it

Bisbee that made James Douglas?" Certainly, it was the success of James Douglas at Bisbee that brought the Copper Queen Consolidated Mining Company and Phelps Dodge Corporation into a position of leadership in the copper mining industry. There is no doubt that it was Douglas' metallurgical proficiency that made the production of anode copper profitable in this waterless, fuelless land. It was others, however, that brought in the necessary sophistication in geological and mining technology needed to find the scattered ore deposits of the Warren Mining District.

Douglas himself brought in some of this talent, but a major contribution was made by the Calumet and Arizona Company. The initial staffing and direction of this company was provided by a group of "Scots" and "Cousin Jacks" from Michigan's Calumet copper country. The Cousins, regardless of the passing generations that were born on American soil, referred to England as "the omeland" and "ome" was the "Old Country."<sup>3</sup> From the tin mines in Cornwall to the copper mines of Michigan, to the western copper camps these professional miners brought skills and discipline to underground mining. Their skills in hand-drilling, blasting, timbering, pumping and stopping were a point of tradition and outright snobbish pride; after all, they had mined tin for the Romans.<sup>4</sup> This pride and tradition can be recognized in the Cornish toast "To fish, tin and copper."<sup>5</sup>

The forerunner of the Calumet & Arizona Mining Company, the Lake Superior & Western Development Company, was formed in a room over a bar in Red Jacket, Michigan in 1899. It would be used as a development company to find and develop copper deposits. A new company would be formed and financed to mine the deposit after an asset had been identified. This would allow the formation of capital necessary for a large copper mining company with several shafts and a smelter.

The Scots and Cousins who formed this original company brought their technology to Bisbee, Arizona at all levels of management. It was this technology applied at the top levels that allowed the company to find and mine Bisbee's hidden mineral deposits. This company, later became the Calumet & Arizona Mining Company (C&A), and became an extremely profitable copper company in just a few years.



*Figure 3. Main Street, 1904*

*Activity in Bisbee's main street had grown feverishly by 1904. There were three major copper producing companies in the district working around the clock and more than a dozen exploration and development companies acquiring positions in the district and developing their properties. Main Street and Brewery Gulch were at the heart of the business district.*

During the darkest days of the great depression in the 1930's the C&A merged into the Phelps Dodge Corporation. After this marriage of necessity Phelps Dodge quickly adopted the C&A technology and absorbed it into its own operations. Building on this base Phelps Dodge became one of America's greatest copper companies. In this advanced technical position Phelps Dodge was able to survive the 1970's and 80's without being adsorbed by oil companies or foreign interests.

## CAP'N HOATSON AND THE LEGEND

The legend of the C&A's entrance into Bisbee according to Joralemon,<sup>6</sup> brings two vacationing Michigan mine captains to Bisbee in 1898. The father and son combination of Cap'n Tom and Jim Hoatson had worked their way up to prominent positions in Michigan's copper country. They had come to Arizona to escape the long winter in the Upper Peninsula and to see for themselves the "red elephant"<sup>7</sup> that was rampaging in the deserts of the Arizona Territory. It was a rude awakening for the Upper Peninsularians to find that there were other copper deposits in North America. The high-grade deposits in Bisbee and Butte had already won a wide reputation, and Arizona's Warren Mining District had an enthusiastic following in the industry journals. For an image of Bisbee in 1898 see Figure 1.

In turn-of-the-century Bisbee, the Hoatson's found cousins and friends who had journeyed westward at an earlier time. In the grand tradition of miners, they gathered at local bars at shift change. Ten hours of hard physical labor in dark and dirty conditions creates a terrible thirst. Miners who knew of the excellent management provided by the Hoatson's were probably anxious to demonstrate their knowledge by criticism of the Copper Queen's short management experience.<sup>8</sup>

Under these close working conditions, the information that a drift in fine ore from the Spray Shaft toward the side line of the Irish Mag Claim would have been a poorly kept secret. Miners would have been proud of this knowledge, and some may have known and disclosed that these claims were not controlled by the Copper Queen. In a similar manner the Hoatson's would determine that the Copper Queen had offered the owner \$50,000 for the property, that this offer had been refused and the owner was asking \$500,000.

Father and son climbed the steep

limestone precipice that comprised Mag Hill. The older Hoatson had completed over 35 years of underground mining, and as he sat on a rock to catch his breath and enjoy the warm February sun, he soon fell asleep. Legend has it that once asleep, he dreamed of the well prepared mine maps that were so familiar to him from the Michigan copper country.

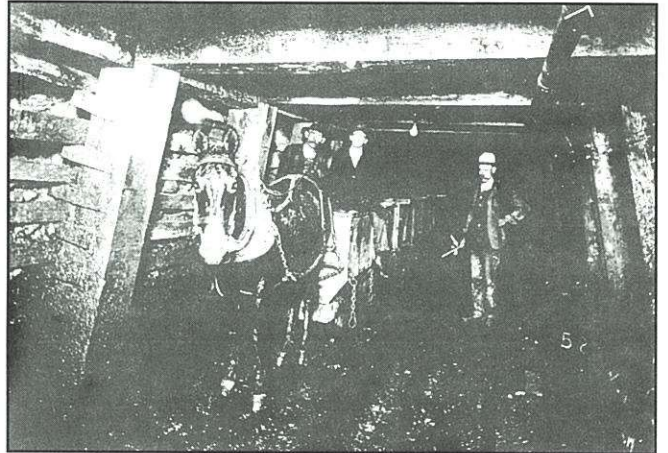


Figure 4. Mule Haulage, 1907

Mule Haulage was extensively used in early western mines for tramping trains of ore cars from the stopes. The ore was extracted to the shaft where it could be hoisted to the surface. This photo, which was taken in the Czar, shows a happy and contented mule pulling a string of four empty cars back to the stopes for another load of ore or waste.<sup>29</sup> Mules were prized by both the company and the teamsters as labor saving devices and were treated with great care and respect. Both the C&A and Copper Queen had established mule barns in all their workings where the mules were fed and rested between shifts. Even during strikes the mule tenders were allowed to cross picket lines to care for the stock.

Note the electric light suspended from the timbers and the candle stick carried by the shift boss standing by the train.

These maps were laid out like floor plans for a tall building. In rich colors of red, green, blue, yellow, brown and black ink on large sheets of starched linen, they showed the workings and geology on each level. The boundaries of the mine workings and various geological formations were shown as they crossed the plane of each plan. The maps in his dream, however, were not of any mine that

he had ever worked; instead, they were maps of the ground under his sleeping body. They showed a shaft nine hundred feet deep and the location of a massive copper ore body. On 100 foot levels, drifts ran horizontally in several directions to the boundaries of the claims. Stopes mined the rich ore between these levels.

The visions were still vivid when he awoke, and he was immediately convinced that this was to be the single most important discovery in the district. He convinced the younger Hoatson of his vision, and they immediately left for Calumet, Michigan, to raise money for the project. They needed \$50,000 to option the property and another \$200,000 for equipment, supplies and labor. They also would need money for a second property payment of \$100,000. If the mine was worthwhile they would be able to pay off the balance of the \$500,000 from operating proceeds.

### THE REALITY

Very early in the history of the Bisbee camp, Dr. Douglas had decided that the iron-stained outcrop of the volcanic neck that made up Sacramento Hill was the limit of the ore in Bisbee. He was so sure of his position that he never bothered to acquire the other claims in that area although they were offered and could have been bought cheaply. He had been quoted as saying, "The Copper Queen had all the ground it needed. If someone could find ore under those barren lime hills, he was welcome to it."<sup>9</sup>

Douglas had entered Bisbee 18 years earlier at the age of 43.<sup>10</sup> He must have been quite an anomaly in the early days of Bisbee. It was said that Bisbee had accumulated all of the bad element that left Tombstone to avoid law and order. Douglas personified the educated, highly cultured gentlemen of the eastern rich. He was well educated in Canada and abroad where he had studied medicine and the ministry. He had managed an insane

asylum, taught chemistry and had a series of financial failures in copper smelting. The populous of Bisbee was uncouth at its very best. Yet Douglas was instantly respected and admired. Perhaps it was his experience in dealing with the mentally ill that prepared him for the crowd at Bisbee. In fact, his principal asset was that he was well liked and trusted.

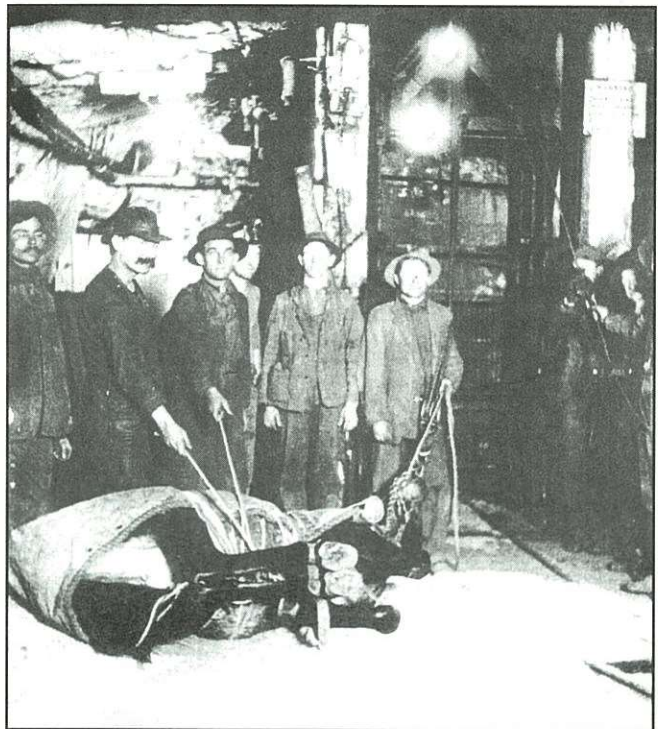


Figure 5. Loading Mules, 1907

Getting mules into the mine was a major undertaking. To keep the animals from hurting themselves during transport in the small shaft and cage compartments they were securely wrapped in this canvas sweater, bound and hoisted into the cage shown in the background. Once underground, where this picture was taken, the wraps were removed and the mule released into his new environment. As indicated by the attendees present, moving the mules was a labor intensive effort.

Note that in this photo one of the miners is wearing a carbide lamp. However, the shaft and station area are being illuminated by electric lights.

In 1881 he had been hired by Phelps Dodge & Company, a metal trading firm, to examine the United Verde Mine at Jerome in the Arizona Territory. Here a deposit of copper-rich bornite outcropped on the

surface. It was 300 feet thick and could be traced on the surface for a half mile along strike. He wrote back that the prospect was a promising one, but, "Its remoteness would make it impossible to operate successfully until there was a railroad in Northern Arizona's Verde Valley."<sup>11</sup>

On a later examination trip to Bisbee, he found a mineralized outcrop that was less than 50 feet in diameter and was surrounded by what appeared to be some of the most barren limestone in North America. Bisbee at that time was somewhat further from a railroad than Jerome but an interest in the property could be acquired for only \$40,000.<sup>12</sup> The property was immediately acquired and Douglas asked to take a percentage in the property instead of his usual fee.

Success at Bisbee did not come easy. The ore had a bad habit of terminating, and new ore leads were not easily found. The ore bodies were high grade, but they were small and elusive. Douglas had run out of ore several times and was about to fold up operations when luck bequeathed the Copper Queen and through either a new discovery or through skillful negotiations Douglas arranged a purchase or a merger with a neighbor. Through phenomenal good luck and the application of business acumen the camp was succeeding and Douglas was acquiring a reputation from its success.

Over the years, Douglas and the Copper Queen managers had developed a policy of paying only modestly when acquiring properties. With the Copper Queen smelter and their capture of the water source for the district, they became overly confident of being the ultimate buyers of any worthwhile mining claim in the district. Mineral exploration is a process of eliminating doubt, and the Copper Queen may have felt that they could eliminate some of this doubt by buying or merging only with those properties that had a blocked-out ore reserve. This is still a popular philosophy with large mining companies.

### THE IRISH MAG CLAIM

About 1890, a drunken Irish miner and prospector named Jim Daly or Daley<sup>13</sup> located claims on a limestone ridge south of the Copper Queen and west of Sacramento Hill. He called these claims the Irish Mag group in honor of his favorite lady of Brewery Gulch's tenderloin. He approached Douglas and tried to sell him the claims but was refused.<sup>14</sup> The rebuke to Daly started a right-of-way feud with the Copper Queen. In a heated dispute, Daly beat up a Copper Queen watchman. Bill Lowther, the local constable, tried to arrest Daly over the incident but was shot and killed in the attempt. Daly avoided prosecution by fleeing into Mexico where he died from excessive Mexican alcohol.

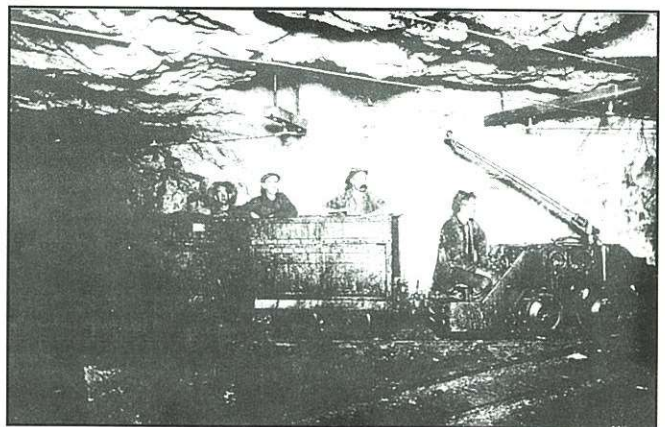


Figure 6. Trolley Locomotive, 1909

*Following close on the heels of the electric lights were the electric trolley locomotive and other conveniences. Although electric lights, trolley locomotives and machine drilling were commonplace on Michigan's Keweenaw Peninsula it was apparently not until the C&A showed up in Bisbee that they were adopted by the Copper Queen.<sup>30</sup>*

Several parties tried to claim Daly's estate. Angela Diaz, a woman who had been living with him in Bisbee, claimed to be his wife and said that she had advanced him money to secure title to the claims. She, in turn, sold whatever interest she might accrue to Martin Costello, a Tombstone barkeeper.<sup>15</sup> A second Mrs. Daly rode the train into Bisbee from Leadville, Colorado and laid her claim to the Daly estate. Andy Mehan, a saloon keeper

from Brewery Gulch<sup>16</sup>, produced a bill of sale and claimed that he had bought the property from Daly in Mexico just before he had gone on his last man-killing drunk. Two storekeepers from Tombstone named Cohen<sup>17</sup> foreclosed a mortgage on Mehan and assumed his rights to the Daly property. Ownership was fought out in the courts, at the delight of the local lawyers. The judge finally awarded the estate to Martin Costello, who got title to the Irish Mag and four other claims.

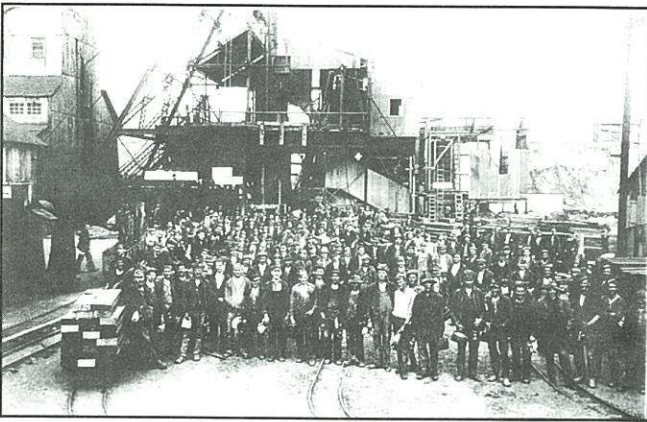


Figure 7. Junction Shaft, 1909

The day shift at the Junction Shaft gathered for this image before going underground. It is easy to see that this group is going on shift rather than coming up because their faces are clean.

The Junction Shaft was sunk on the Wander claim to a final depth of 2,727 feet. It was started in 1903 by the Junction Development Company. This company was one of many created by the original directors of the Calumet & Arizona on capital that was acquired for exploration purposes. If the venture was successful at finding copper the company was sold or merged into the C&A.<sup>31</sup>

The Junction, as it turned out, was one of the most productive mines in the Warren Mining District. From a combination of oxide and sulfides it produced vast amounts of copper, lead and zinc. It was also one of the major sources of gold that made Bisbee Arizona's largest gold producer.

Because of its technologically advanced hoisting system and its fast hoists it was the central hoisting shaft in the district until the mid-1960's.<sup>32</sup>

The Copper Queen, in the meantime, continued to prospect and find ore closer and closer to the Mag sideline. Douglas was trying to acquire the Mag from Costello, but Costello

was asking the unheard of price of \$500,000. At that time, this would have been the most expensive mineral prospect in Arizona.<sup>18</sup> There were a few shallow prospects on the Mag property but no showing of ore. Douglas offered \$50,000 and was refused. It was apparent that he was backing off from his earlier position that there was no ore south of Sacramento Hill.

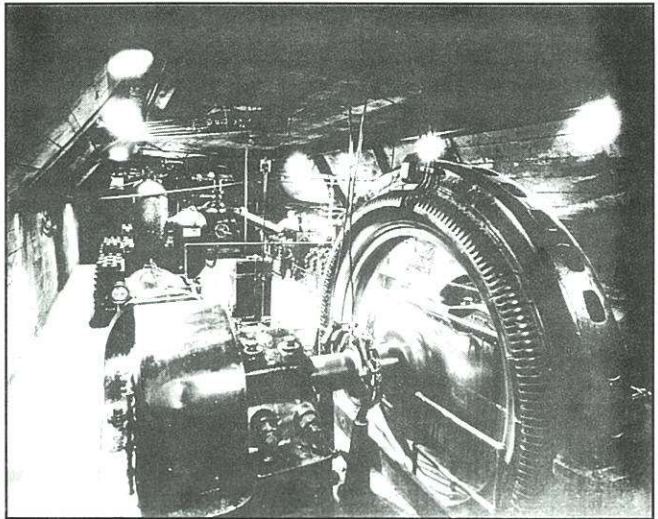


Figure 8. Junction Pump Station, 1910

The Junction Shaft was also the major pumping facility for the district. It was served with pumping stations on the 2700 and 2200 levels for fresh waters and had an acid pumping station on the 1800 level. In this capacity it served both the C&A and Copper Queen until the merger of 1931 and then the Phelps Dodge Corporation until 1990's.<sup>33</sup>

## TRUTH ACCORDING TO THE C&A

According to a testimonial made to Charles Briggs<sup>19</sup>, president of the C&A, the initial directors and officers of the corporation were Charles Briggs, President; James Hoatson and James Milligan, Vice Presidents; Norman MacDonald, Treasurer. John H. Holman, Joseph L. Lathrop, John Graham, Gordon R. Campbell and W. Arthur Phipps were directors. The company was registered under the Laws of West Virginia with a capital stock of \$200,000 represented by 20,000 shares, each having a par value of \$10.00.

The mission of the company<sup>20</sup> was, "To acquire and develop mining claims believed to contain commercial copper-bearing ore bodies." When (and if) the exploration of these claims were successful, the properties would be sold to a mining company to be organized at a later date. With a developed mine and a blocked out ore reserve, this new company would be able to raise sufficient capital to purchase, equip, and operate the mine on a commercial scale.

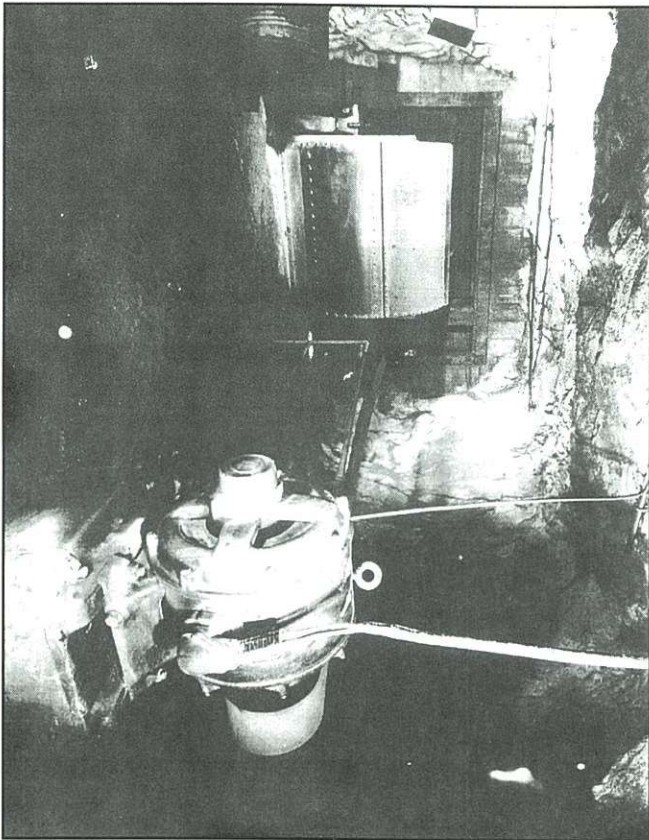


Figure 9. Campbell Fan, 1920

*Michigan copper and iron mines were deep requiring large ventilation fans to circulate fresh air into the workings. This fan was installed on the 1600 level of the Campbell Shaft by the C&A to insure adequate ventilation.*

The promoters were to manage the operations of the company and take down stock as compensation. The one exception, Graham, was sent as a scout to Arizona to contact property owners and make the preliminary arrangements. For this work, he would be paid a small salary and expenses.

John Graham, had worked as a miner for the Copper Queen Consolidated Mining Company at Bisbee and had provided information and shown samples of ore from the Irish Mag to his old boss, Captain Tom Hoatson. At the time the company was formed, he was an employee of the Tamarack Copper Mine in Calumet, Michigan. James Hoatson was selected to make an examination of the property. He had been associated with copper mining in Butte, Montana, as well as the Michigan copper country. His judgment would be based on his personal experiences.

After visiting the property, James Hoatson corroborated Graham's report and added that the claims would prove very valuable and recommended their purchase. The litigation on the Irish Mag claims was still in progress, and Hoatson had to wait six months for the title to be cleared. At that time, Costello set the asking price at \$500,000. It was indeed a high price, but Graham was able to talk Costello into taking \$50,000 down. The balance was to be paid over the next five years.<sup>21</sup>

### RAISING THE CAPITAL

Up to this time, the C&A stock had not been offered to the public, and the development company had limited funds. Gordon R. Campbell<sup>22</sup> an attorney and a director of the C&A, was sent to Arizona to examine the titles. Campbell's favorable title opinion brought about the public offering of the company's stock. The promise was made to the investors that if the project proved to be successful, they would receive several times their costs of the original stock. On the other hand, if no ore were found the total investment would be lost.

Because of the sterling character of the original officers and directors of the company, the stock was quickly sold among a small group of close associates. Many of these original stockholders were miners and

merchants in the Calumet area. As soon as the funds were available Briggs and Milligan returned to Arizona to make the first payment of \$50,000 and to start preparations for shaft sinking. Ground-breaking took place on November 1, 1899.

Shortly after this event, faith in the company started to decay when unfounded rumors began to circulate: certain influential men in the area were reported to have gained information that the claims were worthless. The directors and promoters of the company stuck to their original statement that if successful the shareholders would receive several times their original investment, but if no ore was found, the total sum invested would be lost. They also added that they did not want unwilling stockholders and that any investor who wanted out would have his original investment returned. Some of the investors took the later option, and the company had to take the initial offering outside of the Michigan copper country so that sufficient funding was available to continue shaft sinking.

Among the new investors solicited was Thomas F. Cole, a miner, business man and president and general manager of the Oliver Iron Mining Company, a rich subsidiary of the United Steel Corporation. The principal display was Campbell's map of the Warren Mining District showing the properties controlled by the Copper Queen Consolidated Mining Company and the properties optioned by the Lake Superior & Western Development Company in contrasting colors. What was known of the workings of the Copper Queen and the nearest ore bodies also were shown on the map. It was explained that the Copper Queen was the only operating company in the district, that it had entered the district in 1881, and that it had earned \$676,252.78 in the first year of its activity. Hoatson explained that the equipment and technology being used by this inexperienced company were crude, but that the ores

averaged a phenomenal 16.29% copper and carried important values in gold and silver.<sup>23</sup>

Cole was obviously impressed. He immediately bought several of the original subscriptions and encouraged George E. Tener of Pittsburgh to visit the property and invest if he thought it was worthwhile. With the support of these two important gentlemen, the recently depleted funds were replaced and development of the Irish Mag shaft continued.

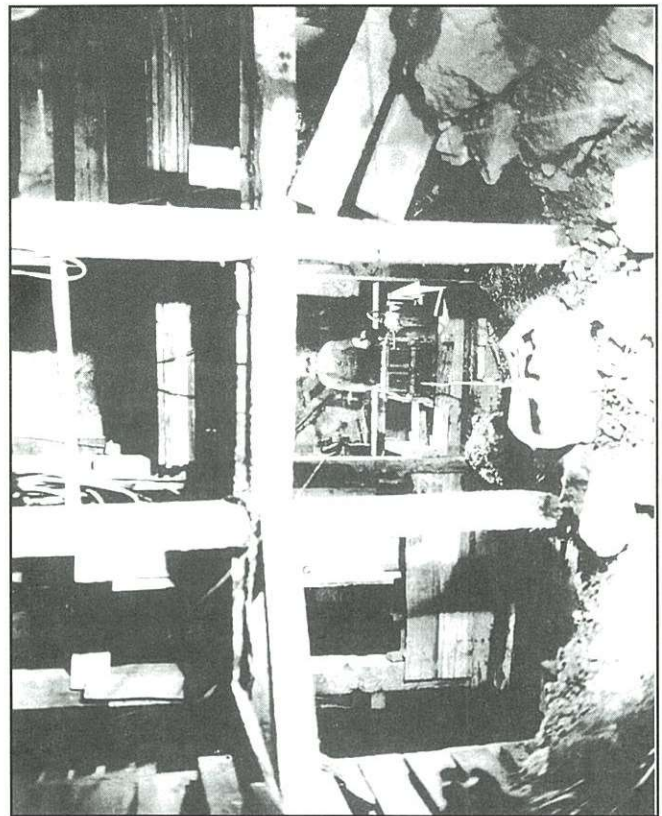


Figure 10. Square Set Mining, 1950

*The forests of Michigan's Upper Peninsula provided the timber for square set mining. Extensive timber use was required in Bisbee due to the "heavy" nature of the ground. The adaption of square set mining by the Cousin Jack was a natural outcome from his experience in Cornwall.*<sup>34,35</sup>

## THE GRAND GAMBLE BEGINS

By the fall of 1900 the shaft had been sunk to 750 feet, but no ore had been found. The company, in the meantime, had all but run out of money. Several times additional



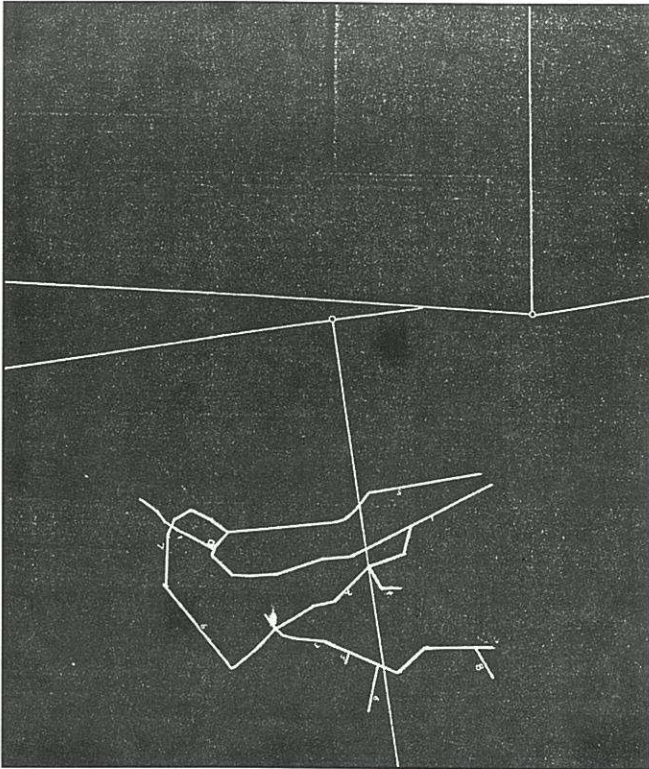


Figure 11. Copper Queen 6th Int, 1916<sup>36</sup>

This is a portion of the map filed with the Arizona State Tax office in 1917 showing the 6th Interior Level of the Southwest Mine of the Copper Queen Consolidated Mining Company. It shows the location of the underground drifts and crosscuts on a scale of one inch equals two hundred feet. The solid straight lines terminated in a small circle, are the boundaries of various mining claims projected onto level maps. This form of mapping was typical of the technical work done by the Copper Queen at the turn of the century. This map was simply updated and submitted in 1917.

subscriptions had to be obtained. With no ore showing in the shaft and little money left from the last fund raising, Captain Hoatson gave instructions to drift northeastward from the shaft on the 650 and 750 foot levels. Fate, in the Warren Mining District, has usually rewarded those with faith and perseverance: consequently, these drifts ran into high grade ore in February 1901. Initial reserves were estimated at over 500,000 tons averaging in excess of 7% copper.<sup>24</sup>

Next Month...

The conclusion of *Roots of the C & A*, including the listing of all reference material and bibliography.



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