# Driving the Kellogg Tunnel: Two Miles to Glory—or Ruination?

By Fritz E. Wolff, M.Sc

**Figure 1** Hand drilling blastholes at the Bunker Hill discovery outcrop.
Circa 1886. #8-x24, Historical Photograph Collection, University of Idaho Library, Moscow, ID

On a hot summer's day in July 1885, an out-of-work carpenter, Noah Kellogg, discovered an outcrop of silver-bearing lead mineralization.

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Kellogg was looking for gold, and had no training in what this gray material was, but his grubstakers knew, and in a matter of months a virtual forest of claim posts sprouted on the south bank of the Coeur d'Alene River in Idaho. This outcrop became the centerpiece of the new district, a town sprung up at it's feet in Milo Gulch—and after the courts had settled a myriad of conflicting claims, became the Bun-

ker Hill and Sullivan Mining and Concentrating Company (BHS). But there were problems: At that early date, what we now call the Silver Valley had no infrastructure to support a mining operation of any scale; just a trail or two—no roads, no rail and no machinery. Because of this situation, it soon became obvious that the unfolding prospect clearly exceeded the know-how and resources of a few argumentative prospectors. Real management and venture capital were needed. In 1887, Simeon Reed, a Portland financier with connections to the Crocker National Bank in San Francisco, paid $680,000 for the property and hired the best engineering talent available to turn the property into an economic venture: Victor Clement, the mine's first superintendent, followed by Fred W. Bradley, who was in turn succeeded by Frederick Burbidge—an English mining engineer educated at the Royal School of Mines.[1] As events unfolded, serious constraints imposed by the mountainous terrain—no storage room for waste, or mill tailings, and reliance on a problematic Bleichert aerial tramway—extracted a heavy toll on the operation's viability. Something had to be done. Would the life of the mine depend on a hoist and shaft perched precariously on the sixty-degree side slope, or on an egress tunnel two miles away on the valley floor?

Initially, work progressed rapidly on the rich vein, dipping at an angle of fifty degrees southwesterly from the outcrop's glory hole. (See figure 1). Miners dug three interconnected haulage levels into the mountainside, each separated by two hundred vertical feet. Production stopes fifteen to thirty feet wide and hundreds of feet long yielded run-of-mine ore assaying over thirty-five percent lead and as much as fifty ounces of silver per ton—incredible values by today's standards. Mined-out areas were backfilled with high-grade zinc mineralization, a metal with almost no use at the time.[2]

In September 1892, Superintendent Victor Clement, sitting at a desk in the embryonic company's clapboard office, penned a longhand report to

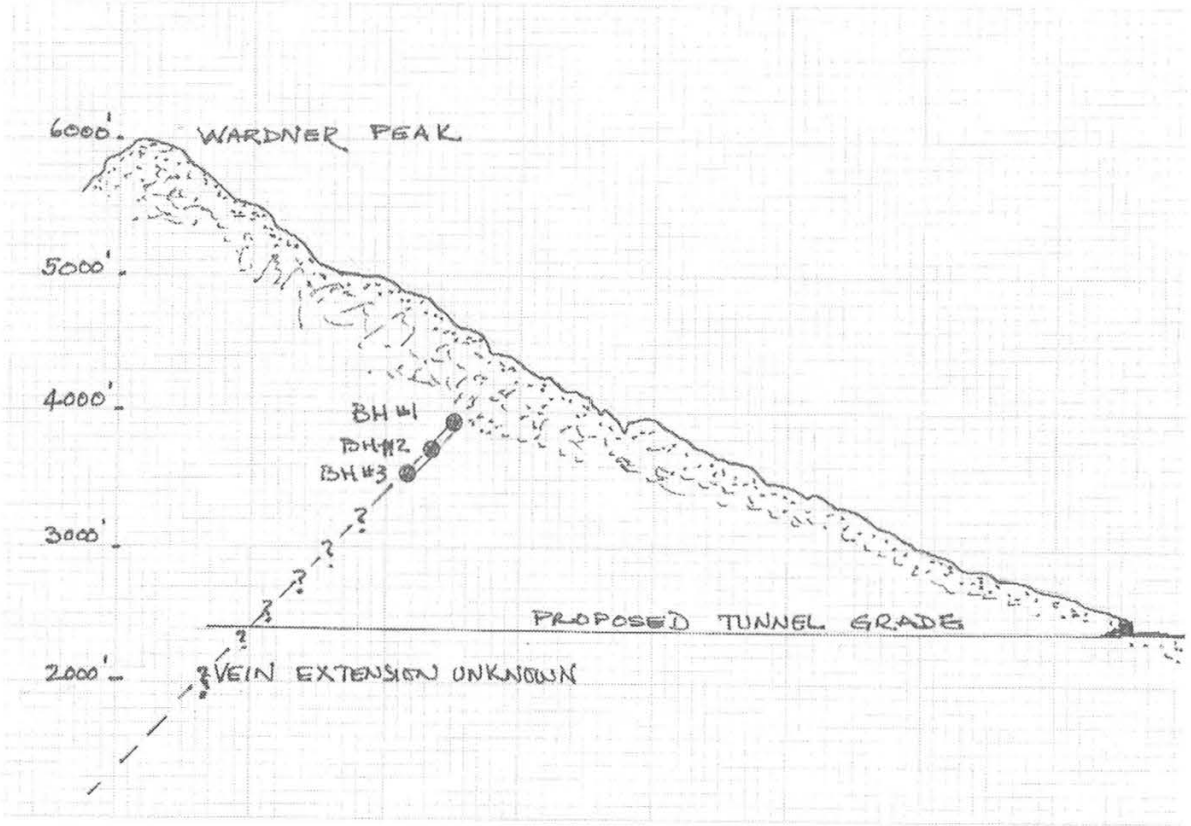


**Figure 2** Generalized cross-section: Relationship of Bunker Hill levels 1, 2, and 3 to proposed tunnel location. (View Westerly.)

(then) company president, John Hays Hammond. This letter is the first mention in surviving correspondence that the ultimate development of the mine depended on driving a lower-level tunnel to intercept the expected continuance of ore at greater depth (See figure 2). He is completely straightforward about what needs to be done:

> My Dear Jack,
> We should push for the big tunnel. I am getting bids for a small compressor . . . we will be able to run for a considerable distance for $10 to $12 per foot.[3]

But two years passed without a go-ahead decision. By May 1894, the logistics of handling material—supplies going in and ore coming out to the tram and down to the mill—strangled production for a number of reasons: Ore from the most distant development required hand-tramming 2,900 feet over roughly laid narrow-gage track until it reached a transfer point where horses plying the haulage drifts picked up the cars.[4] In addition, the Bleichert tramway proved more troublesome than originally thought; sometimes working as advertised, oftentimes breaking down or prematurely showering tons of ore on residents living two hundred feet below the catenary cables in an understandable state of anxiety.

Delay on the tunnel decision continued for two more years, by which time the total cost had escalated from $120,000 to $200,000—a cost roughly equivalent to $4 million today. So the gamble to proceed with the project, or not, became a pivotal decision for a young company struggling for survival in a period of depressed metal prices, and increasing pressure from the Western Federation of Miners (WFM) for increased wages. Deep pocket investors notwithstanding, everything was at risk—cash in the bank, earnings, future dividends—capital to build a smelter, to develop markets. What if it didn't work? What if the vein faulted off or terminated prior to reaching the tunnel elevation? A ten thousand-foot tunnel is a hard thing to ignore. In essence, the decision amounted to betting the company on the distance anyone thought they could see into the earth; about a molecule deep.

It is understandable in retrospect that Bunker Hill management did what many corporations (and governments) do today: hire a consultant. If the project is successful, the company can take credit for doing the right thing; if not, the consultant becomes a convenient scapegoat.

The company hired C. R. Corning as a consultant. His articulate reports began to crystallize the issue for management in support of Clement's proposal, coming down strongly on the side of the tunnel as opposed to the shaft option. In July 1896, after a visit to the mine, Corning wrote a lengthy report outlining some pros and cons of the decision to be made.

> As matters stand at present, I deem it highly advisable that preparations be made for the active pushing of the deep level tunnel so long since proposed, starting from the mill at Kellogg. I decidedly favor the tunnel for several reasons. It will permit of our extracting practically as much ore as may be desirable: whereas, a shaft will be limited in its output to whatever the present tramway may be capable of carrying. (scarcely over 600 tons per diem). Again, a shaft means placing the company much more at the mercy of a Union, as the works would have to be kept dry. Such a tunnel would be ten thousand feet long providing the vein maintains its present dip. It would cut the vein near the northern boundary of the Bunker Hill claim, probably between the Last Chance and Stemwinder ore shoots, neither of which is definitely known to encroach on our territory.[5]

Near the date in the right-hand corner of Corning's letter (above) is the notation: "Aboard the Steamship *Ionic* off Gibraltar." One conjures up a picture of Corning on a sun-drenched deck—perhaps wearing a straw-boater hat, blue blazer, and white cotton trousers while reading field notes and keying the report on a portable Underwood typewriter.

The tunnel option also provided an excellent

avenue for improved ventilation—always a key consideration underground, and a means of cutting production costs by *dropping* water to daylight from overhead workings as opposed to *lifting* it via a combination of breakdown-prone pumping contraptions and wood-stave pipe.

Corning's prescient statements were on target, given what we know in retrospect, that the tunnel would provide life to the Bunker Hill and Sullivan mine for the better part of a century. What he could not foresee was the extent to which the mixed-up Precambrian geology of north Idaho would turn the tunnel drive's closing hour into one of anxious concern for management.

Corning knew that commandeering the necessary real estate for tunnel's right-of-way posed a vexing problem. He recommended locating a long string of "quartz claims" across the countryside to gain ingress for the tunnel's centerline, "as a means of insuring title to ground over which the company has no control."[6] (A *quartz claim* in the parlance of the day was a convenient subterfuge for a standard 600-foot-by-1,500-foot mineral claim with no mineral on it and, quite possibly, no quartz).

**Figure 3** Frederick Burbidge, Superintendent of Kellogg operations. #8-11072, Historical Photograph Collection, University of Idaho Library, Moscow, ID.

Another imperative required purchase of two land parcels near the proposed portal. The first posed no problem, owned as it was by a cash-desperate Noah Kellogg, who had by that time given away or drunk his way through most of his $150,000 share in the discovery. On the other parcel, foundations for two saloons had been laid, and the company feared that a town would spring up on the site. A claim not owned by BHS, the Jackass, lay right in the center of the proposed right-of-way. A remark made by management at the time, is a poignant reminder of how drastically communication has changed in the post-telephone, post-satellite, world: the principal owner was a Catholic priest—"who is now at a mission on the Yukon River, and cannot be reached until *(seven months later)* the Spring breakup"[7] [Author's italics].

In a series of moves best described as the "end justifies the means," enough real estate to start the drive came into company hands. After drilling and loading the first tunnel round in mid-May 1897, the mandatory shout of "Fire in the hole!" echoed across Jackass Flats. Just for a historical perspective, the first tunnel shot took place within a few hours of the Castle Gate coal mine robbery, eight hundred miles away in Utah, where Butch Cassidy and Sundance Kid had stolen $8800 in payroll gold.[8]

As the recently appointed superintendent of Kellogg operations, a tough and loyal Frederick Burbidge (See figure 3) assumed responsibility for driving the tunnel along with all BHS mining and milling operations—clearly an enormous job. News of the tunnel's progress played but a small part in his initial reports to the head office, but after six months of intense work, Burbidge wrote in his October report: "Progress in the tunnel is much slower than we have expected—the rate of advance being only 5 or 6 ft. per day—of 3, eight-hour shifts. The chief trouble is the bad air, which causes a great loss of time

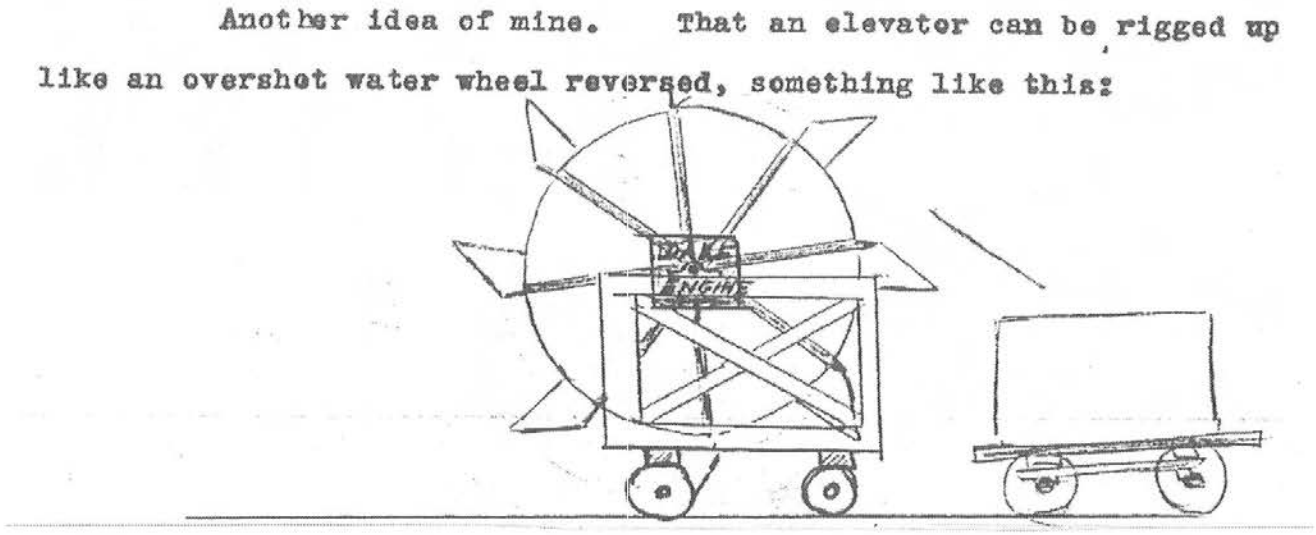


**Figure 4** Conceptual sketch of mechanical mucking machine. (F. Burbidge)

and makes the men sick."[9] Even though an exhaust fan was in place to suck powder fumes from the face, it was able to run only when the water level in Milo Creek was sufficient to keep the Pelton wheel and dynamo turning—only in the early morning during late Fall.

The use of stick-dynamite was fairly well advanced at this juncture in 1897—in terms of efficient rock breaking; but what appears less advanced is the technology and processes for manufacturing supporting products like fuse and caps. The inconsistent quality of these crucial links in the chain, gave a new meaning to the term misfire or *bootleg hole* because the failure of any one component created an extremely touchy problem for the shift following the shot.

> We have lost three rounds through misfires. Whether these are due to poor fuse, poor caps, or poor powder, or all three, it is hard to determine. The fuse occasionally goes out before reaching the cap, and caps have been heard to explode without exploding the powder. An accident occurred last night . . . One of the men had spit his fuse and started out, and had gone a little way when the charge exploded. A large piece of rock hurled down and struck him breaking one or more ribs. Some tests made by Mr. Burch today show the fuse to burn at 3 ft. per minute, whereas it should burn at less than one foot per minute. Again, the fuse is so brittle a great deal of it cracks in uncoiling, even though it be fairly warm.[10]

Lifting shot rock away from the tunnel face and tramming it to the surface took so much time, that Burbidge became frustrated to the point of trying all possibilities. In an innovative attempt to solve one problem, another is born—in this case an ethnic conflict.

> We lost considerable time during the week . . . preparing to run the heading full size, . . . partly on account of trouble with the shovellers. I let a contract to some Dagoes, but the drill men and others at the tunnel threw every possible obstacle in their way, and abused them to such an extent that they quit. What little they did was the best and cheapest loading we have done at the tunnel, and I am trying to induce them to return to work with the guarantee that they shall have proper treatment. Failing this, I propose to let a contract for 2000 feet of tunnel, and let all of our present crew go.[11]

Dissatisfied with the time required for hand-mucking, imposed either by human lethargy or prejudice, Burbidge's thoughts turned to mechanization. A miniaturized underground steam shovel was one idea, a conveyor belt another. He sketched an overshot bucket wheel excavator powered by an engine (See figure 4) as another possibility—an embryonic forerunner of the Eimco mucker developed in the 1930s.

Tunnel progress during 1898 and 1899 continued more or less on schedule—in a good month the crew advanced as much as 354 feet. But in February 1899, only 53 feet.[12]

An unforeseen event related to wages stopped tunnel progress altogether in the Spring of 1899. The issue was a relatively simple one by today's standards: should muckers be paid $3.50 per day—the same as machine men and timbermen—or $3.00 per day as was the practice? The wage levels themselves had not changed in seven years. The workweek consisted of ten-hour shifts on thirteen consecutive days—Sundays off every other week.

Fearful of what wage demands might mean to the company's profits and unionization in general, BHS management fought all attempts by the (WFM) to organize the workforce. Pinkerton Agency detectives working covertly as miners, infiltrated union membership meetings, at considerable risk to their health and well-being; one agent was even elected union secretary at the Burke local. Daily reports to the Mine Owners Association (MOA) on union activities were signed, for example; "Operative 15" or "Operative 108." The company used coded telegrams to convey sensitive information. Mysterious messages left at "specific drops" by pro-union workers added anxiety to an already tense situation. One note, a piece of foolscap tacked to the BHS mill flume, read: "Who are those guys? Where did they come from? What do they want?"

On 29 April 1899, all hell broke loose.[13] An angry mob of eight hundred WFM miners congregated at 10:00 a.m. near the Gem Mine in Burke, and commandeered the Northern Pacific Railway's engineer, Levi Hutton, holding two Winchester rifles to his head. "Pull out for Wallace, and be damned quick about it," he was told. Fortified with 60 cases of dynamite stolen from the Frisco Mine's powder house, guns, and a generous supply of Periwinkle Rye whiskey, the "Dynamite Express's" two passenger cars and eight box cars crawling with angry miners, sped down-grade toward the Wallace station ten miles away. Here, an astute telegraph operator realized what was taking place and wired ahead to Burbidge of the danger. Burbidge did what any good manager would have done with the news: loaded up his family, the rest of the staff, and left for Spokane.[14]

Switching from the Northern Pacific tracks to a siding, owned by the Oregon Railway and Navigation Company which serviced the brand-new BHS mill, the mob placed three thousand pounds of powder at strategic locations inside and blew it to matchsticks. The recorded time was exactly 2:26 p. m. Lumber and cast-iron shrapnel rained down on the town of Kellogg a mile away, and littered the tunnel portal and staging yard (See figure 5).

The uprising made front-page news in papers across the United States, and understandably became the immediate focus of intense intra-company discussion. Two months later, Burbidge wrote a concise picture of the aftermath in his fiscal year-end report, submitted July 20th:

> "On May 3rd, the Governor of Idaho proclaimed martial law in Shoshone County, and at his request United States troops were sent in to assist in restoring order. Upwards of 1000 men were arrested for supposed complicity in the rioting, and although a great many were subsequently released, about 200 remain in prison at this date. The County Commissioners and Sheriff, who failed to take any steps to prevent the rioting, although advised of its approach, have been removed from their offices."[15]

Work on the tunnel came to a standstill until crews could be reassembled. Progress resumed in due course over the summer of 1899, but October found the crews encountering another hazard, this time water. "It has been very wet—more so than at any time heretofore—and the ground has run into the

**Figure 5** Bunker Hill millsite—aftermath of the union uprising. #8-x13a, Bunker Hill and Sullivan mill, Explosion 1899. Historical Photography Collection, University of Idaho Library, Moscow, ID.

tunnel from far above the timbers. It has been necessary to bulkhead the face most of the time. Last week the progress was *one foot*" [author's italics].[16] (Note: This is probably the point of advance, standing at approximately 6,900 feet from portal, where the tunnel intersects the Osburn fault—one of, if not *the*, major tectonic features in the district. This strike-slip fault transposes the south and north sides of the Silver Valley seventeen miles or more in an east-west direction.[17]

Local knowledge assumed that the tunnel headed in the general direction of the BHS upper workings, but the exact bearing, South 20 degrees West, proved to be a closely held company secret—for the reason that it trespassed directly underneath the Empire State company's Last Chance Mine. (See figure 6). Sweeny was a feisty Irish immigrant, whose battle with BHS over the Apex Law and "Extralateral Rights"—to pursue ore under another's claim sidelines—took district courts years to settle, eventually in BHS favor. In the meantime, there was no love lost between the two companies.

With the tunnel heading rapidly approaching the Last Chance property, BHS management decided to address the trespass issue, and in the process displayed a disingenuous side of their own. A proposal was brought forward for condemning portions of the Last Chance and Emma claims in the name of obtaining right-of-way—wherein the real reason lay in expropriating ground thought to contain valuable ore. The condemnation proceedings fell apart however, and Burbidge spelled out the dilemma faced by the company—whether to continue and go for a jury case, or seek a court-appointed appraisal. This latter

course of action had serious drawbacks, described in a report written in February 1900:

> If appraisers are appointed, they may make an inspection of the tunnel and call for a survey which will show that *we are not heading for that ground through which we are seeking to condemn a right-of-way*. It will probably be better to let this drag along . . . until we get through the ground in controversy into our own [author's italics].[18]

In a comment that underscores the precarious nature of BHS attempting to sneak through foreign property by stealth, one of the shift bosses, Joe Klever, informed Burbidge he had heard blasting shots fired in Empire State's Skookum stope directly above the tunnel heading, which meant the reverse situation could be equally true. Burbidge worried about this potentially dangerous turn of events: "The fact that we hear the reports of their shooting shows there is very little chance of our getting through to the vein without the shots in the tunnel being heard by them. If they hear us . . . they will probably try to enjoin us or head us off in some way."[19]

The outcome of this drama has been lost to history. Management probably decided to delay the tunnel rounds until after the Empire State shots had subsided and the workings above were unmanned.

It's possible to assume that a full year after dynamiting the mill some slackening in labor/management tensions had taken place. But such was not the case—martial law still ruled the day, and danger hung over camp like a blanket of smelter smoke. In a letter to Fred Bradley dated 22 June 1900, Burbidge described an attempted shooting of Joe MacDonald, a fellow member of the MOA:

> I learned just as I was leaving Wardner today that an unsuccessful attempt was made this morning to assassinate Joe MacDonald. I did not get much detail—but understood that

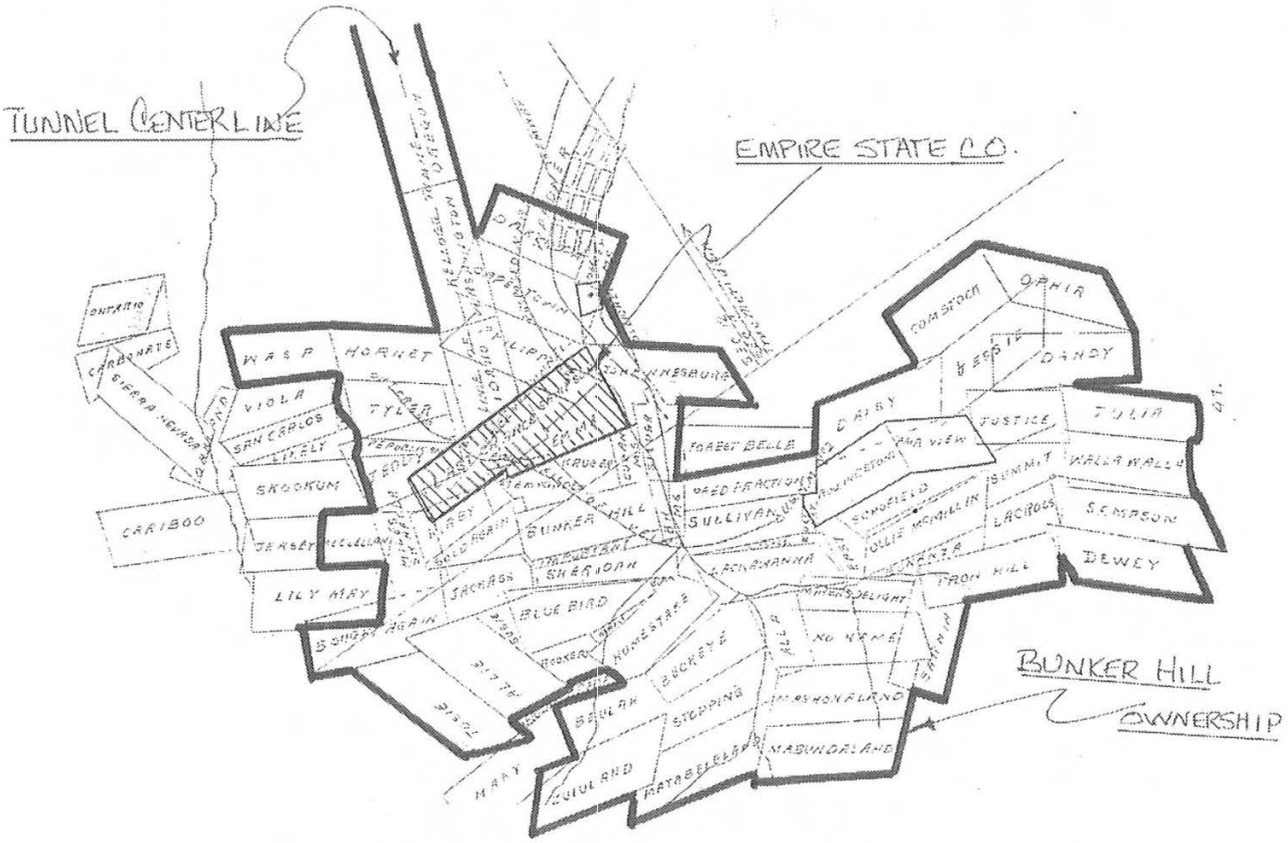


**Figure 6** Relationship of Kellogg Tunnell centerline to Empire State's *Last Chance* claim. May, 1901.

four shots were fired at him as he stood outside his office by parties concealed in the brush on the mountainside opposite. None of the shots struck him very fortunately. It is highly improbable that the miscreants who did the shooting will be captured. It is an important occurrence as indicating the desperate character of the dynamiters who made such an attempt despite the presence of U.S. troops. Tom Greenough, who came down today said that he was warned . . . to keep a watch out for himself as similar attempts would be likely made against him and me. I should think this last outrage will have the effect of rousing the law and order people to active work for carrying the election.[20]

As the tunnel drive advanced to within a few hundred feet of the much-anticipated vein intersection, management scrutinized every round, looking for some indication their big gamble had paid off. Depressing as it was, the fact remained that no mineralization showed up in daily examinations of the heading. Finally, in late December 1900 a stringer of galena several inches wide was cut 8,259 feet from the portal. This occasion gave some credence to the company's statement that "*The* vein was cut on December 24."[21] This was not quite the same thing as saying "The downward extension of the rich ore from our upper workings has been cut," but the statement had an encouraging ring to it.

The drive continued into barren ground, deadending ten-thousand feet from the portal. After three and one half years of hard-won progress, a di-

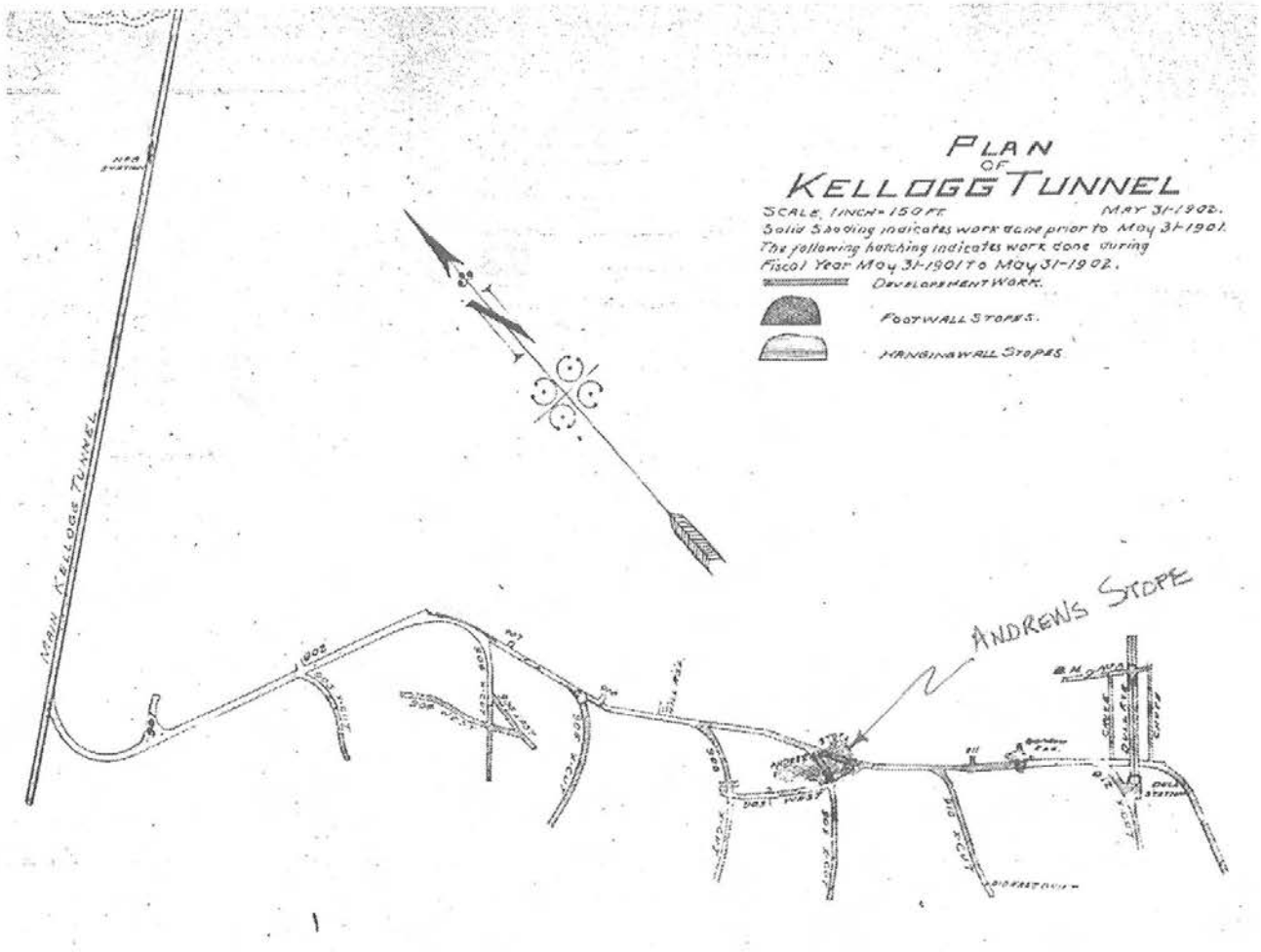


**Figure 7** Exploration drifting after tunnel completion. May 1902.

rective went out to stop the advance. One can speculate it might have been very quiet in company circles at this time. Ore was supposed to be in sight, but was not—the fruits of a $200,000 expenditure remained out of reach.[22]

What was said at that barren heading has gone unrecorded, and anything written at the time has been lost—either by accident or on purpose. A very concerned Fred Bradley and Burbidge, taking council at the dark terminus must have wondered what to tell the stockholders, or if indeed anything. The likely question of the day was: "Where do we go from here?"

Since the tunnel alignment had aimed at the westward trend of the upper veins, still nine hundred feet above the tunnel level, the crew was directed to back their machines several hundred feet toward the portal, and begin excavating a curving exploratory drift to the southeast—giving credence to the old adage, "When hunting for elephants, go where elephants have been." This proved a wise strategy. Round by round, each day's work during 1901 revealed an increasing and encouraging degree of overall mineralization.[23] Persistence and patience paid off when miners in the "909 West Crosscut," later to become the "Andrews Stope," cut a thick vein of silver-rich ore (See figure 7).[24] This is the top of the famous March orebody which enriched corporate coffers for twenty years, and provided the capital for exploration of other structures; finally resulting in a network of one hundred-eighty miles of underground openings and reaching from an elevation of 3,600 feet to 1,700 feet below sea level.

Frederick Burbidge stayed the course until the valuable vein extensions were found, displaying considerable determination and courage to see the tunnel drive through to completion in the face of tremendous upheaval and personal danger—caused in no small part by the company's distinct anti-union policy. A report from Pinkerton operative #15 gives us an indication of what course "personal danger" might take at that time:

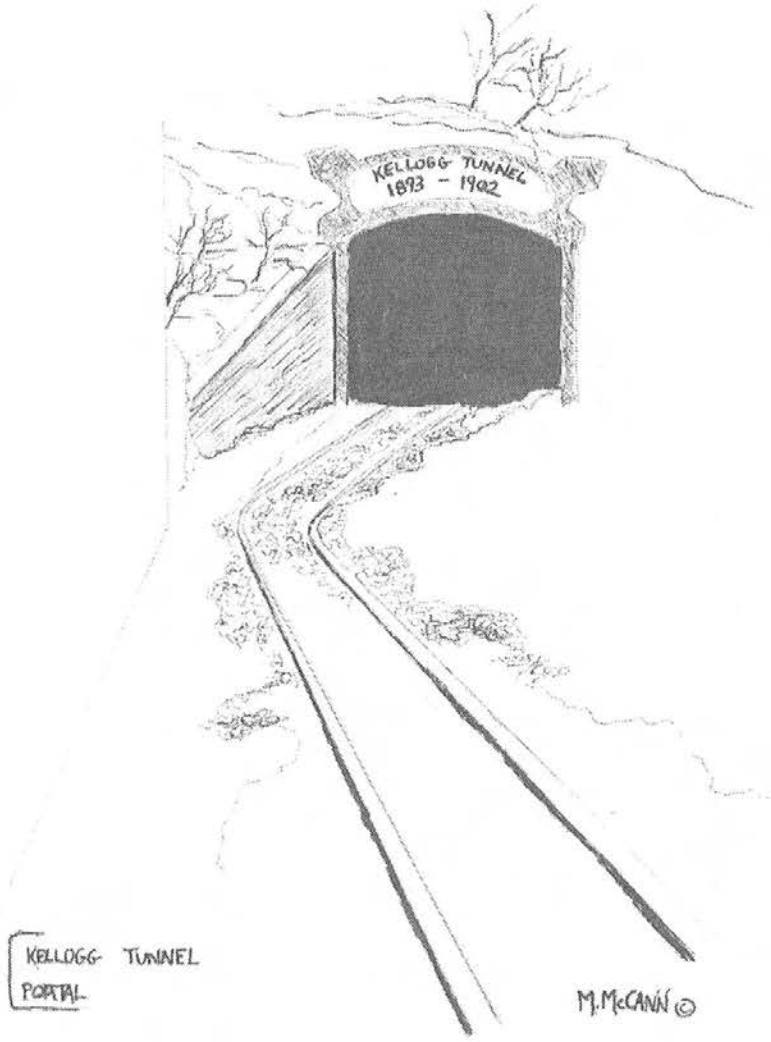


**Figure 8** Sketch of the Kellogg Tunnel portal as it appeared July 1977, by M. McCann. (Courtesy of Mary McCann)

> Burkbridge [sic], or a man of a similar name, formerly superintendent of the Bunker Hill & Sullivan, is in danger every time he goes up the Burke canyon. If he ever goes down into the Frisco mine he is, in the vernacular of the men, a "goner." They are going to kill him on the cage if they have to run it into the head sheave. They are bitter against him.[25]

Today the Kellogg Tunnel still stands—a slender thread to daylight from deep beneath Wardner Peak. A full century after its oft-interrupted completion, miners intent on giving the Bunker Hill mine a renaissance use it daily. Over the years, 4.5 million tons of lead metal and 430 million ounces of silver have been hauled on its narrow-gage track to the outside world—from a different perspective, that total production would make up a train of flatcars five hundred fifty-miles long. In addition, it provided a round trip for every miner, timberman, hoistman, electrician, pipefitter, shift boss, and foreman that worked there. Its first proponent, Victor Clement, may have relied on instinct or made only an educated guess—but he was dead right in 1892 when he wrote to John Hays Hammond: "We should push for the big tunnel" (See figure 8).

## Notes

1. Patricia Hart, and Ivar Nelson, *Mining Town*. (Seattle: University of Washington Press, 1984), p. 38.
2. Umpleby, J. B., and Jones, E. L., *Geology and Ore Deposits of Shoshone Country, Idaho*. U.S. Geological Survey Bulletin 732, 1923, pp. 50-57.
3. Letter, V. M. Clement to John H. Hammond, 12 September 1892. Bunker Hill Mining Co. Manuscript Group 367, Special Collections, University of Idaho Library, Moscow, Idaho. (Hereafter cited as Bunker Hill MSS.)
4. Report, C. R. Corning to Bunker Hill and Sullivan Co., President and Board of Directors, 14 May 1894. Bunker Hill MSS.
5. Report, C. R. Corning to General N. H. Harris, 14 July 1896. Bunker Hill MSS.
6. *Ibid.*
7. Report, Frederick Burbidge to F. W. Bradley, 29 October 1897. Bunker Hill MSS.
8. Kelly, Charles, *The Outlaw Trail*. (Lincoln: Bison Books Edition, University of Nebraska Press, 1996.)
9. Report, Burbidge to Bradley, October 1897. Bunker Hill MSS.
10. Report, Burbidge to Bradley, 7 December 1897. *Ibid.*
11. Report, Burbidge to Bradley, 15 December 1897. *Ibid.*
12. Manager's fiscal-year-end report, 31 May 1899. *Ibid.*
13. General Correspondence File, folders 93-99. *Ibid.*
14. J. Anthony Lukas, *Big Trouble: Murder in a Small Western Mining Town sets off a Struggle for the Soul of America*. (New York: Simon and Schuster, 1997), 112.
15. Cover letter for Manager's fiscal-year-end report, 31 May 1899. Bunker Hill MSS.
16. Report, Burbidge to Bradley, 30 October 1899. *Ibid.*
17. Fryklund, Verne C., *U.S. Geological Survey Professional Paper*, 1964, p. 9.
18. Report, Burbidge to Bradley, 16 February 1900. Bunker Hill MSS.
19. Report, Burbidge to Bradley, 25 May 1900. *Ibid.*
20. Report, Burbidge to Bradley, 22 June 1900. *Ibid.*
21. Manager's fiscal-year-end report, 31 May 1901. *Ibid.*
22. Stanley A. Easton Taped Interview. Stanley Easton Papers, 21 October 1957, MS Group 5, University of Idaho Special Collections, Moscow. "Late in the summer or mid-fall of 1902, I reported to Kellogg to take over. The situation was as follows: the tunnel on the valley floor level started by Clement back in the '90s had been gradually extended until it had cut the structure at which ore could be expected to be found. All of the orebodies in the upper levels indicated a strong westerly trend and the tunnel had been projected to cut this point, but unfortunately, when the tunnel reached the indicated area, the rock *structure* was found but there was no ore." •Also, author, personal observation, 1956.
23. Report, Al Burch to Bradley, 21 December 1901. Bunker Hill MSS.
24. Manager's year-end report, 31 May 1902. *Ibid.*
25. Report, Operative 15 to Stanley Easton, 13 January 1906. Folder #1578, *Ibid.*