Discovery of Mining Camps in South–Central Nevada

By Joseph V. Tingley,
Thomas P. Lugaski,
and Alvin R. McLane

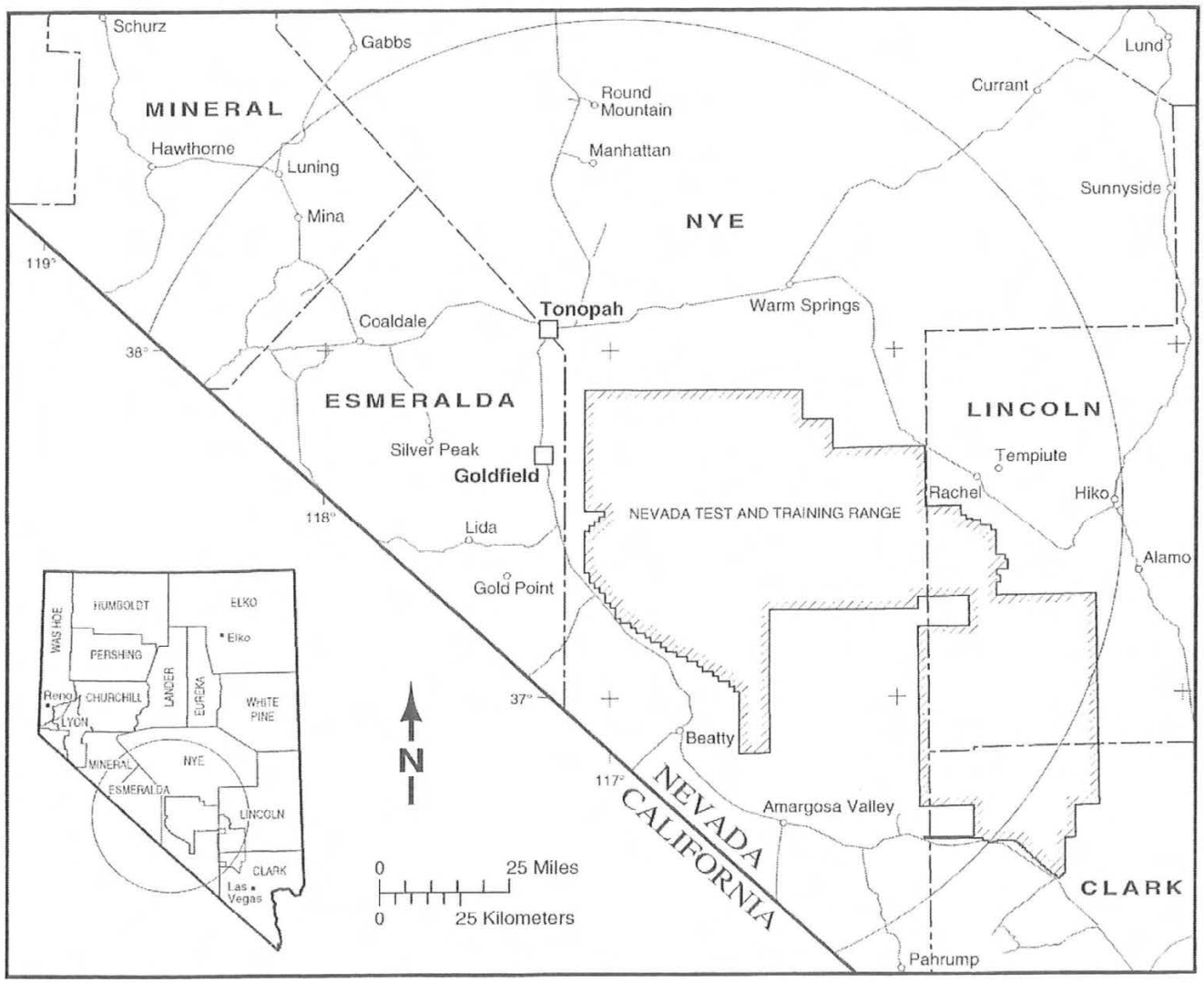

Figure 1: South–central Nevada. The area of interest lies within the large circle, roughly centered on Tonopah and Goldfield

Mineral discoveries in south–central Nevada (Fig. 1) in the late 19th and early 20th centuries occurred during three rather distinct boom periods. The search for minerals in each period was inspired by a prospecting concept very different from the one which had driven the preceding period. As each boom got underway, prospectors sought their fortunes by using the char-

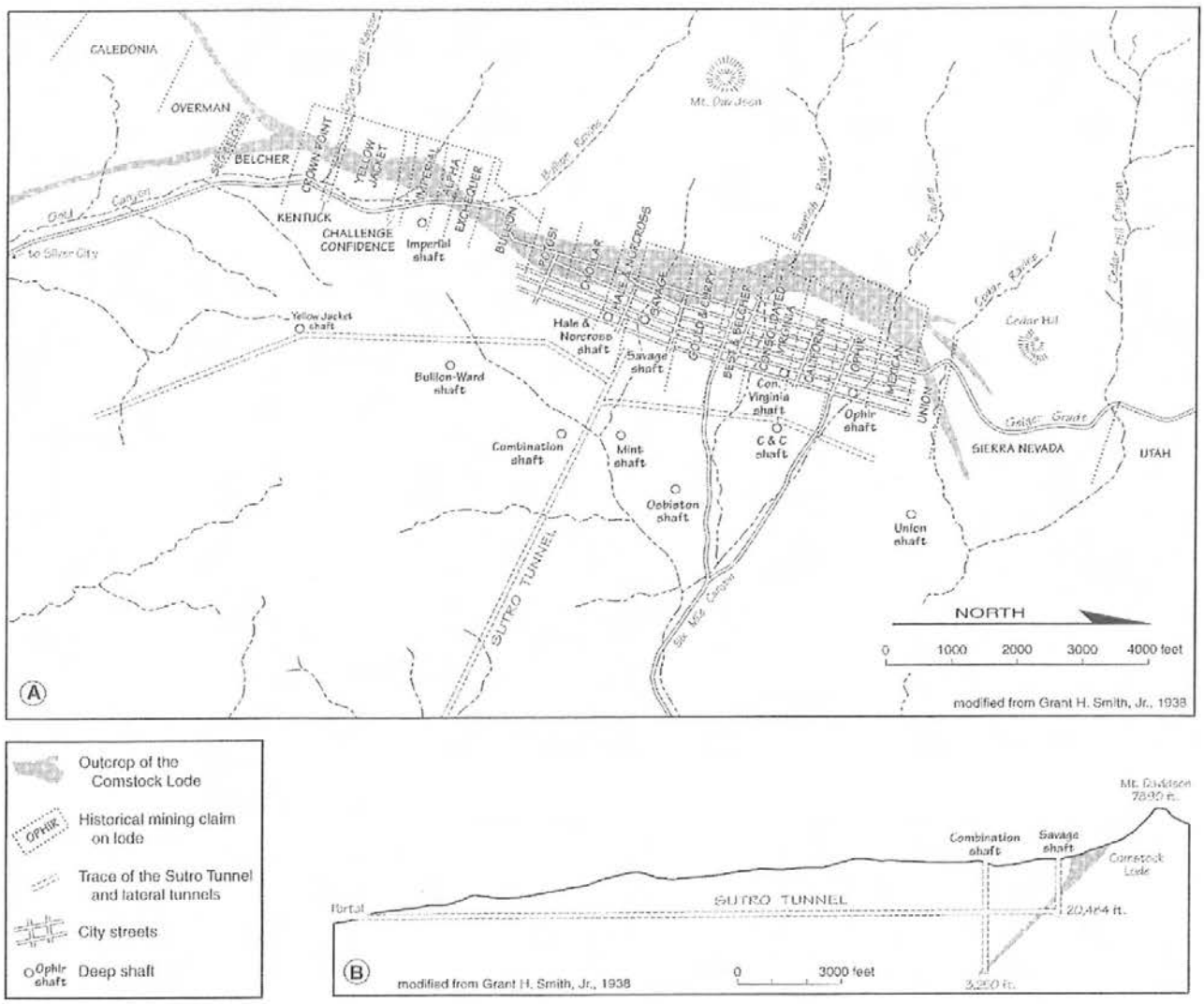

Figure 2: Plan (A) and cross section (B) of the Comstock Lode, Virginia City, Nevada. The Comstock Lode defined the "true fissure vein" for generations of Nevada Prospectors. While depicted here (in gray pattern) as a uniform mass that narrowed at depth, the lode was actually a stockwork zone (a zone of narrow, branching and interconnecting veins) of brecciated, mineralized quartz formed along the Comstock fault.

acteristics of the "type bonanza" of that period as a recipe, or model, for their search. This procedure led to important mineral discoveries, but it also limited what was found to the particular type of deposit in fashion at the time. The three boom periods important to south–central Nevada were: the pre–1900 silver boom; the 1900 to 1911 gold boom; and a period spent searching for strategic metals which ran from about 1911 through the end of World War II.

The pre–1900 Silver Era

The first boom, kindled by the 1858 discovery of silver on the Comstock Lode in northwestern Nevada, prompted waves of prospecting activity across the entire territory. This boom lasted, with a few exceptions, until about 1870, and resulted in mineral discoveries at numerous sites in central Nevada. Discoveries of this era, mimicking those on the Comstock, were largely silver deposits found in "true fissure veins" or "lodes," as the prospectors referred to them (Fig. 2). Discoveries of this period, beginning with the Comstock, included Unionville, Austin, White Pine, and Tuscarora in northern Nevada. In south–central Nevada, prospectors made important discoveries at Silver Peak, Lida, Belmont, and Tem

Piute (Fig. 3).

The predominant silver minerals were 'sulpherets' (various silver sulfides) and horn silver (silver chloride). The common gangue minerals were quartz and calcite. While usually present, gold occurred in much smaller amounts than silver. The mercury amalgamation recovery method most often used on these ores was a process used in the silver mines of Mexico in the sixteenth and seventeenth centuries and later refined on the Comstock. The Comstock milling process mixed pulverized ore, or pulp, with salt, mercury, and water in steam-heated vats called pans—hence the name: "Washoe Pan Process." After mixing for up to twelve hours, gold and silver particles freed from the ore combined with the mercury. The resulting gold–silver–mercury alloy, known as amalgam, was collected from the bottom of the pans for retorting. Retorting consisted of placing amalgam in a sealed still, called a retort, and heating it to drive off the mercury and leave behind a gold and silver "sponge." The mercury was recycled, while the sponge was melted and poured into an iron mold, forming a gold–silver doré bar - weighing about 100 pounds. These bars were usually shipped directly to a mint for refining into pure gold and silver.

Silver mining entered into a period of decline in Nevada as the end of the nineteenth century ap-

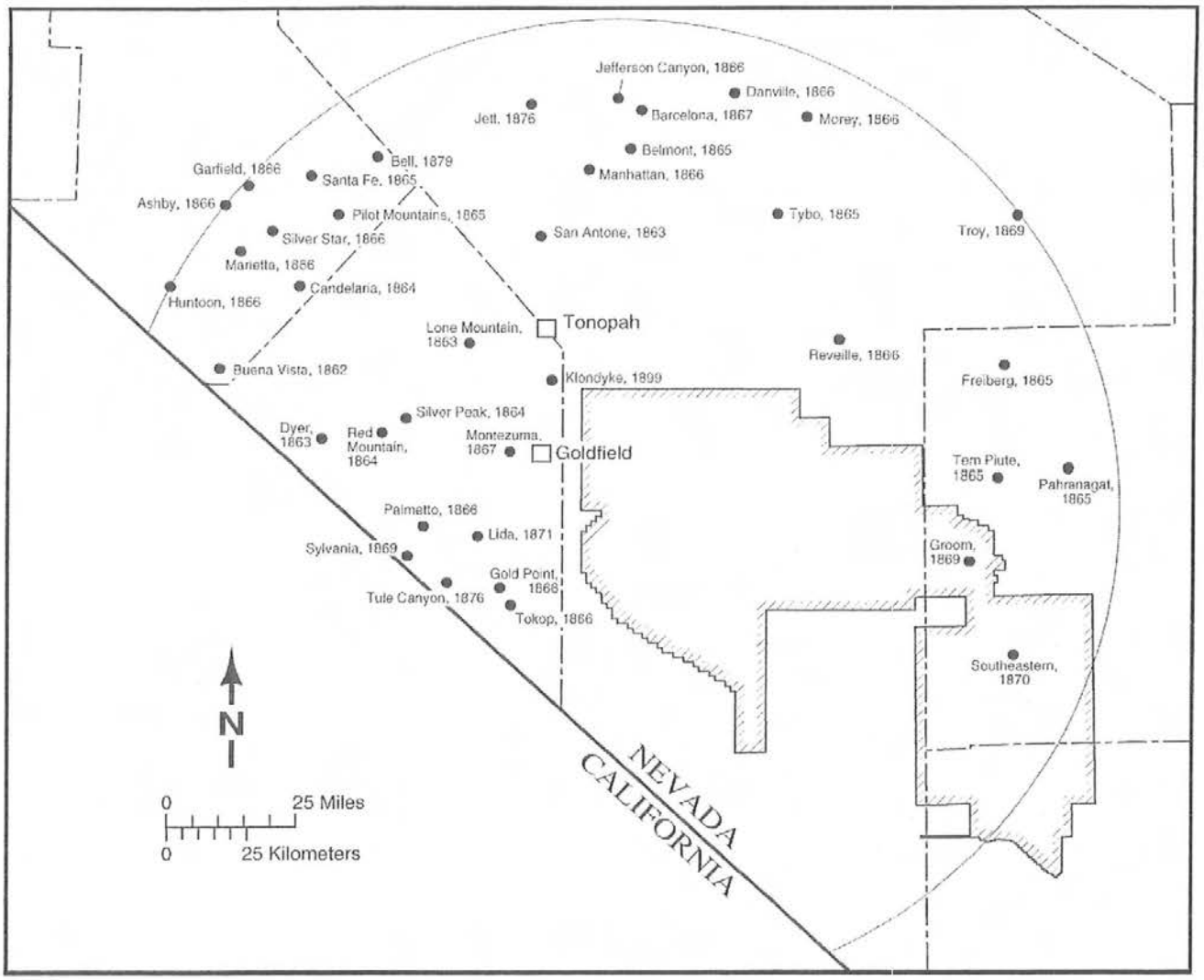

Figure 3: Mining districts in central Nevada established prior to 1900.

proached. The federal government demonetized silver in 1873, beginning a general decline in silver prices. Silver was re–monetized in 1878, and government silver purchases resumed in 1890 under the Sherman Silver Purchase Act. Unfortunately, the resumed federal silver purchases came too late to help Nevada's silver mining industry. Comstock production began its final decline about 1880, and other Nevada silver camps had even shorter lives. By the turn of the twentieth century, most of Nevada's silver bonanza camps had passed into memory.

The Gold Era of 1900 to 1911

Nevada prospectors' attentions turned to gold in 1891 with the discovery of deposits at Delamar in southeastern Nevada. Located in a remote part of Lincoln County, Delamar was the first major district in Nevada mined primarily for gold. However the 1899 discovery of the Southern Klondyke District, a few miles east of present–day Tonopah in Esmeralda County, proved more important to the impending gold boom. While traveling to this district from his ranch in Monitor Valley in 1900, Jim Butler strayed off the normal route and made the Tonopah discovery. While Butler did not discover a new type of ore—Tonopah's silver ran in "true fissure veins," like that of the Comstock—the Tonopah rush attracted attention to the central part of the state. This area had been little prospected previously because of unfavorable perceptions. The Tonopah rush led to the discovery of Goldfield, and the second Nevada mining boom—this one made of gold—was on.

In his 1909 treatise on the geology of Goldfield, F. L. Ransome ably described what happened in south–central Nevada at the turn of the twentieth century, writing in summary:

> At the beginning of the present decade the state of the mining industry in Nevada had so far declined as to appear but a feeble and flickering reminder of past splendor. . . . With the opening of the year 1900, however, there were signs that some of the older camps were preparing to shake off their dusty lethargy. But the one great event which transformed a gradual resuscitation of mining . . . into a movement almost explosive in its energy and suddenness . . . was the discovery, in 1900, of the Tonopah deposits by James L. Butler. Prospectors were not slow in acting upon this striking demonstration of the fact that the State of Nevada, owing largely to its uncompromisingly desert character, had hitherto been very inadequately prospected.[1]

Using Tonopah as a base, prospectors scattered over the desert. As the size and richness of the new bonanzas became known, the number of explorers increased.

Many of these prospectors, as well as earlier ones, must have walked over the low hills which lie east of Montezuma Peak twenty–four miles south of Tonopah. They could scarcely have failed to observe the dark siliceous outcrops, or combs, which are a notable feature of that topography, and must have connected them with ore deposition. It is difficult to comprehend how gold ore of such unprecedented richness, lying so close to the surface, escaped detection while work was in progress at the nearby camps of Montezuma, Lida, and Silver Peak. The explanation is probably that the earlier prospectors were looking for quartz veins of the normal type— particularly silver–bearing veins—and finding nothing of value in the projecting parts of some of these curious, rusty "blow outs," they concluded that all of them were barren.

The gold pan was not then a recognized part of a Nevada prospector's outfit, and the first attempts to use it at Goldfield were unsuccessful because the pioneers panned the hard quartz broken from the croppings instead of the soft disintegrated material which generally contained the gold in that district. Augustus Locke, another famous geologist of the time, wrote of Goldfield in a 1912 issue of the *Engineering and Mining Journal*:

> There was nothing to hold the gold-seekers' eye [sic]; rusty, siliceous ledges existed in vast quantity, and good ore reached the surface in several places, but the croppings which contained the gold were effectively hidden in the

> multitude of their similar brethren which carried no gold whatever. The country had that "burnt up" aspect which the miners associated with barrenness.[2]

Thus Goldfield differed from Tonopah and the earlier generation of Nevada silver camps. Its geology and mineralogy were different, its outcrops were different, even the colorful splash left on its rocks by the oxidizing minerals was different. Most importantly, its primary mineral—gold, not silver—set Goldfield apart. Goldfield did not have a well-developed lode, nor did it display a single vein. Instead, the gold deposits were associated with large areas of orange, red, and even black, iron–oxide staining (the "burnt up" aspect), and there were silica ledges weathered into rugged knobs (the "combs") scattered around the camp (Fig. 4). Prospectors working the area after the Goldfield discovery set their sights on this very different target. They staked out an entire second generation of mining camps in south–central Nevada (Fig. 5).

Some of the Resulting Discoveries

Cactus Springs was the site of a turquoise discovery in 1901. The Bailey brothers found gold and silver in the area in 1903, when they prospected the area of the Fairday Mine on the east side of the Cactus Range, south of Cactus Springs. The Thompson Mine was discovered on the west side of the range in 1905. Large outcrops, stained shades of red and orange by iron–oxide minerals, attracted prospectors throughout the Cactus Springs District.

A party of prospectors discovered gold at Gold Crater, about twenty miles southeast of Goldfield, late in the summer of 1904. An accidental find of several large pieces of float, liberally sprinkled with free gold, caused a stampede to what the *Goldfield Weekly News* issues of 29 February and 28 March

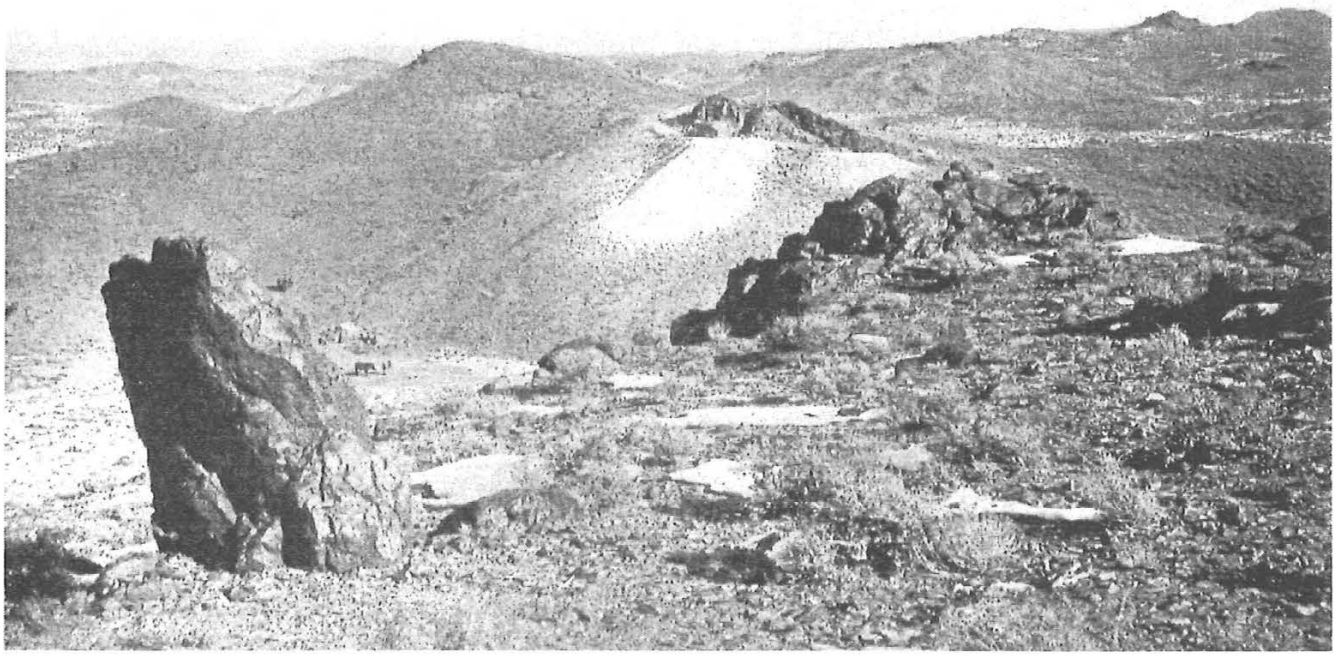

Figure 4: Rugged silicified ledge in the Goldfield District, Esmeralda County. Photo from Ransome, "The Geology and Ore Deposits of Goldfield, Nevada," facing p. 150.

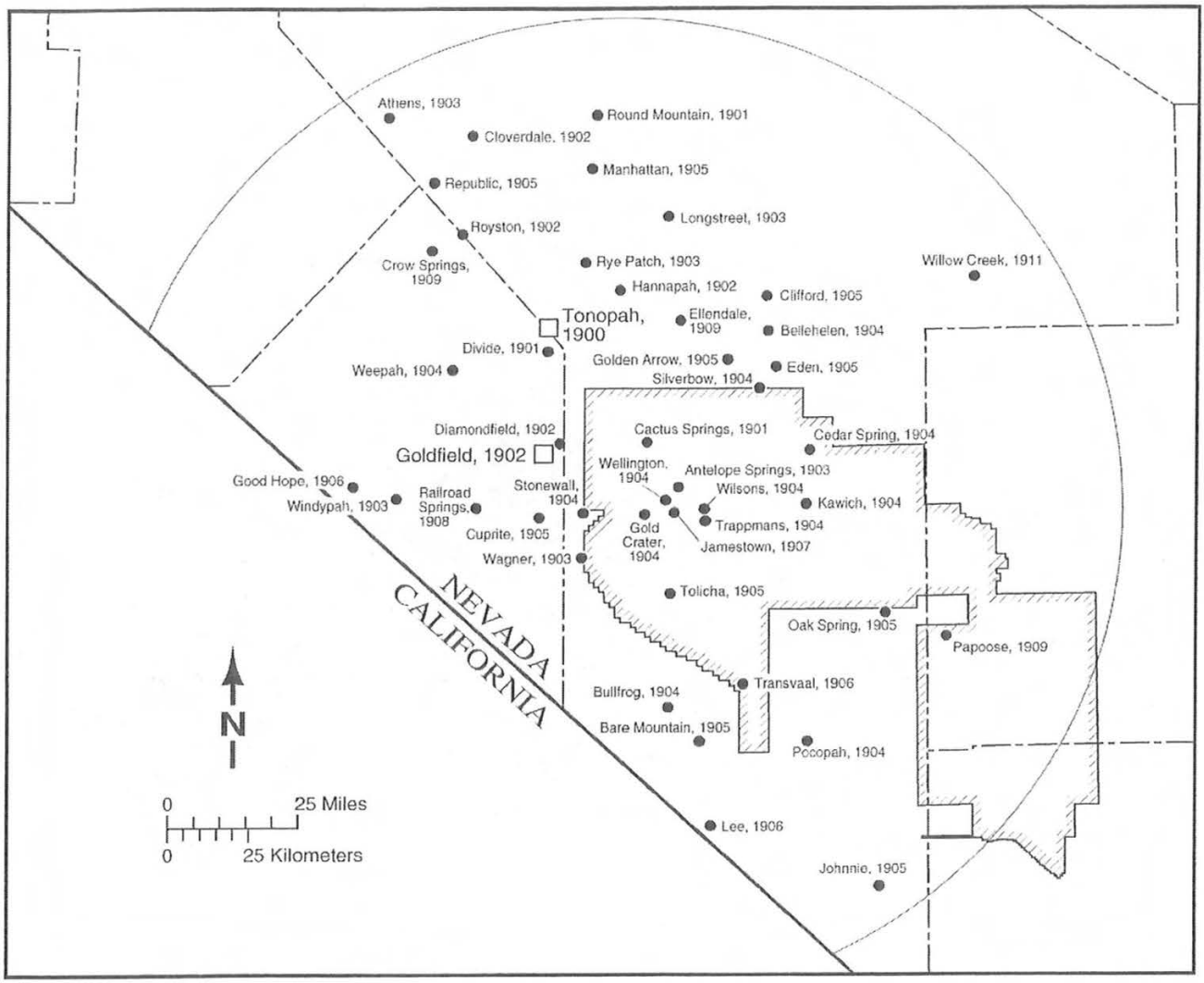

Figure 5: Mining districts in south–central Nevada established between 1900 and 1911.

1908, described as:

> the confines of an extinct volcano, the rim of which is about eight miles in circumference. In the center of this area were pushed up three large sized hills, or blow-outs from which radiate numerous dikes. . . . Intruded in these porphyry uplifts are ledges of quartz forming networks of silica and the porphyry itself is highly silicified. It is possible; it is probable; it is almost certain that nowhere else in the state of Nevada is such a quantity of quartz cropping and none of it is barren. Iron accompanies the quartz in such abundance that the croppings are sinister black or glowing red in the distance owing to the freaks of the oxidation process. Sometimes, even, the coloration is peacock green and blue. Gold Crater was undoubtedly once a mushpot of Mother Nature, in which the bubbles arose and, bursting left crevices upwards through which crept the silicificating waters.[3]

(The marked similarity between the "ledges" at Goldfield and those at Gold Crater can be seen by comparing Fig. 4 with Fig. 6.)

The Jamestown deposits, some five miles east of Gold Crater, were discovered in June of 1907 by the James brothers, and that camp was the site of a small rush in the spring of 1908. The *Goldfield Weekly*

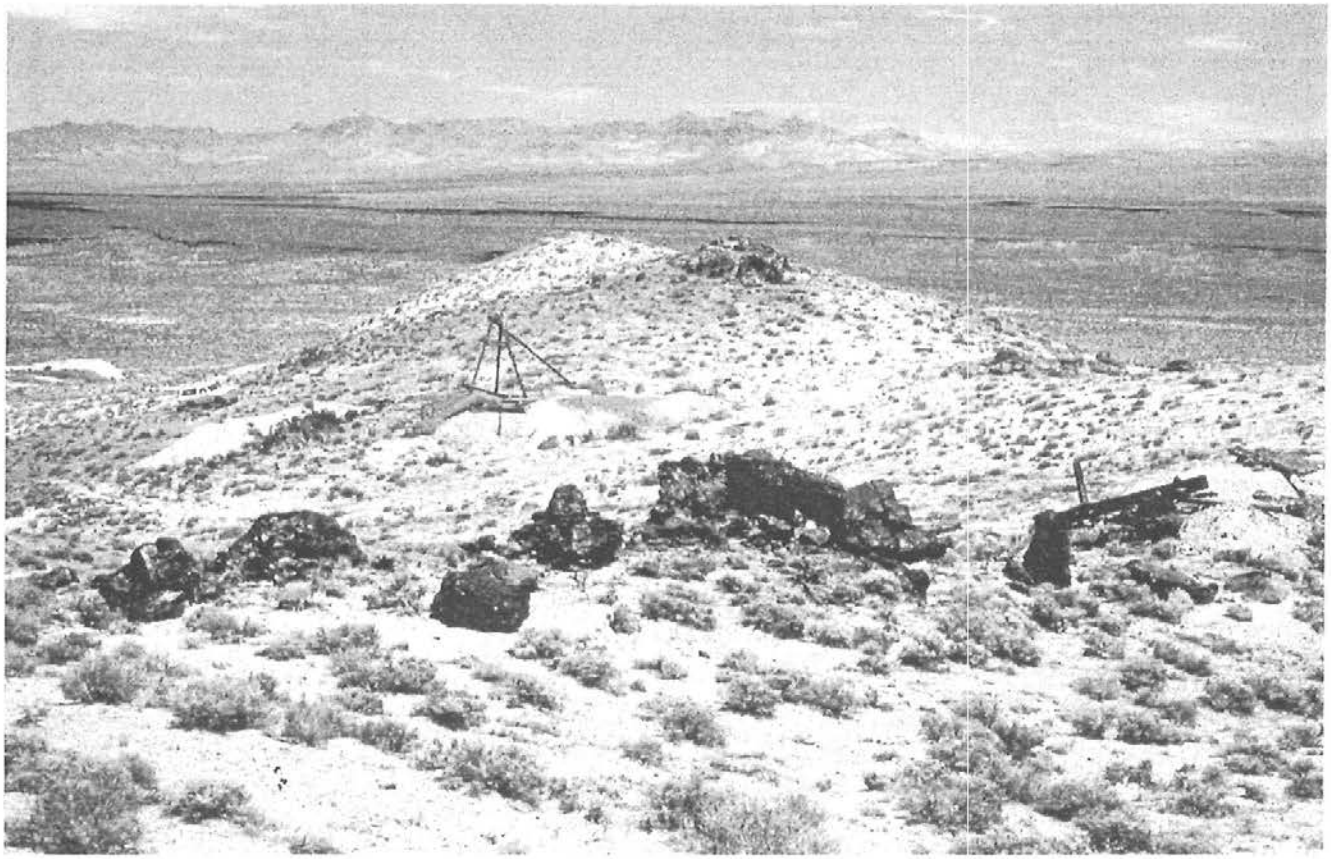

Figure 6: Silicified ledges cropping out in the Gold Crater District, Nye County. The Cactus Range is in the background, the dar k layers in the valley are post–mineral basalt flows originating from Stonewall Mountain to the west (out of the photo to the le ft). J. Tingley photo.

News reported in April, 1908, that "the ledges of the district are fissures in rhyolite and are true quartz, carrying considerable iron; the formations resemble those at Gold Crater, only more mineralized. The entire country surrounding the strike is capped with malapai, which is only a few feet thick and beneath it is the lode porphyry, which is gridironed with ledges." (Figure 7 shows one of the main ledge outcrops at Jamestown.) At the end of the year the *News* reported that "Jamestown, the new camp in the Cactus Range is pluming itself on the possibility of its developing into a copper camp. On the James Brothers ground a value of fifteen percent copper was uncovered at a depth of fifteen feet, another value from the 200–foot level showed twenty–three percent copper. The two strikes were made on parallel veins both of which are cut by a great dike."[4]

In the years from 1967 to 1969, the central Jamestown properties—the Mohawk, Daisy, Last Chance, and Golden Chariot claims—were the focus of an Atomic Energy Commission plan to mine low grade copper ore by means of an underground nuclear explosion. After the original Arizona test site was dropped from consideration, a search for an alternate site was undertaken in Nevada. By some unspecified means, possibly airborne geophysics, an area including the old Jamestown mines came to the attention of the AEC. The commission approached the property owners with proposals to acquire the ground for the nuclear test, but nothing came of the venture. The test was never conducted, and the only remaining evidence of the AEC scheme is in the name of the family–owned company now controlling the claims—Fuetsch Nuclear Mines, Inc.

Another Goldfield–era discovery, Gold Reed, is on the east side of the Kawich Range a little over twenty–five miles east of Jamestown. In December of 1904, O. K. Reed and Ed Slavin made the first locations at Gold Reed on a rugged knob of silicified porphyry reported to contain flakes of gold up to an

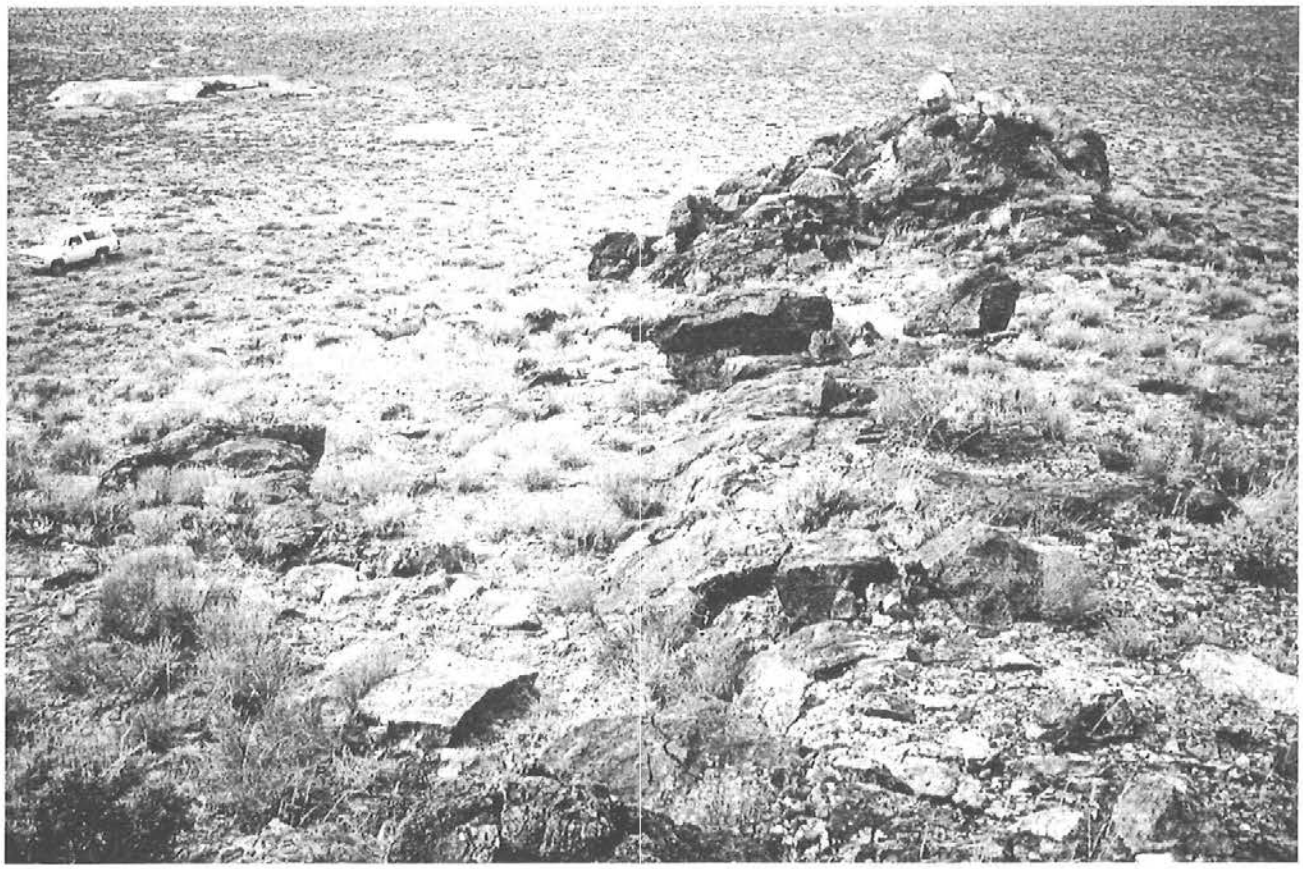

Figure 7: Silicified ledge in the Jamestown District, Nye County. The Golden Chariot dump and shaft site are in the upper left o f the photo. J. Tingley photo.

inch in diameter. The discovery precipitated a rush of several hundred people to the site in early 1905. By the spring of 1905, the town of Gold Reed—or Kawich, as it was also called—supported four stores, eight saloons, two lodging houses, two restaurants, a sporadic stage service from Tonopah, and a post office which operated until 1908. Water, non–existent at the site, had to be shipped in at the rate of $8.00 a barrel from Cliff Spring in the Belted Range twelve miles to the east. Most of the rich surface ore did not persist at depth and the camp was nearly deserted by the end of 1905. Mineral deposits at Gold Reed were described as closely resembling those at Gold Crater.[5]

The camps of Golden Arrow, Silverbow, Wellington, and Antelope Springs were also established during the Goldfield–generated flurry of prospecting. But these discoveries were lode deposits more characteristic of the first boom period, proving, perhaps, that Nevada prospectors still remembered their Comstock roots.

In milling technology, the cyanide method of gold recovery largely replaced amalgamation during this period. The cyanide process was developed in Glasgow, Scotland, and patented in England in 1887. The first cyanide plants appeared in the United States in 1891, in timely coincidence with the beginning of central Nevada's turn–of–the–century gold boom. In this process, finely ground gold ore was mixed with a solution of sodium cyanide (which replaced the more expensive potassium cyanide originally used). The gold–bearing cyanide solution was then passed over zinc dust which caused the gold to precipitate out as a black sludge. This sludge was collected on filters, dried, mixed with some flux, melted in a batch furnace, and the resulting bullion cast into ingots. The dore bars were then sold to a refiner. In general, the cyanide method proved more efficient than amalgamation; it allowed more of the gold to be recovered from the ore, and it

was relatively cheap. This meant that large volumes of lower–grade ores could be treated at a low unit cost.[6]

Strategic Metals, 1911 Through the War Years

The camps of the third boom period (Fig. 8) were discovered during an era of heightened interest in mineral exploration which preceded World War I. Even before the U.S. entered the conflict, it became apparent that the loss of access to foreign supplies was going to result in critical shortages of strategic metals such as copper, manganese, mercury, and tungsten. The search for ores containing these metals became the primary focus of the third prospecting boom. Since Nevada prospectors have never been able to ignore gold and silver, they located new precious metals deposits at the same time. This third period of discovery included the depression years of the early 1930s and continued through the end of World War II. The last of the strategic metals–period camps, Don Dale, came to life thanks to mercury discoveries there in 1945.

The strategic metal mercury was discovered at Mercury Mountain, Queen City, and Mine Mountain in Nye County; Don Dale in Lincoln County; and Fish Lake Valley in Esmeralda County. Other strategic metals were located in some of the older,

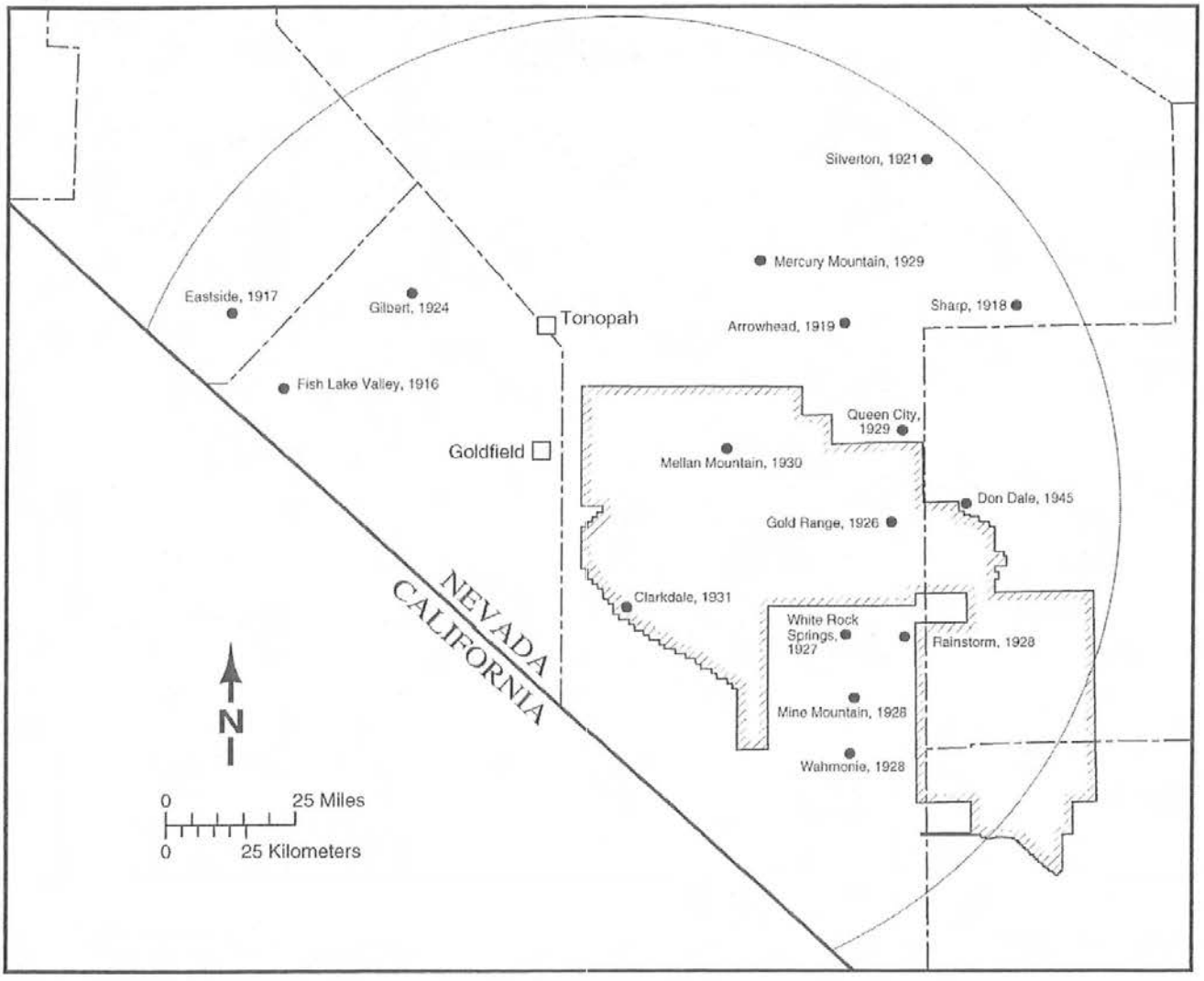

Figure 8: Mining districts in south–central Nevada established after 1911.

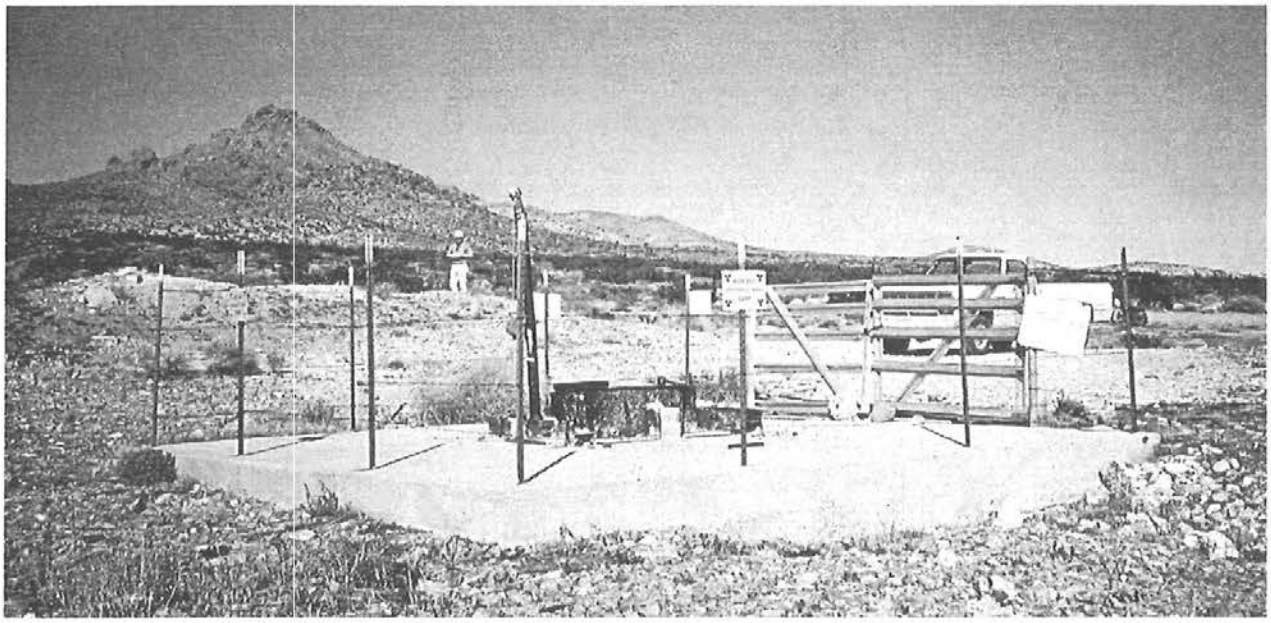

Figure 9: Cemented collar of the Wingfield shaft, Wahmonie District, Nye County. Note the small "radioactive waste dump: sign posted on the fence. The old Hornsilver Mine is beyond the prominent peak in the background. J. Tingley photo.

long–dormant districts of south–central Nevada. Tungsten was found at Oak Springs in Nye County and Tem Piute in Lincoln County; copper was discovered at the San Antone District north of Tonopah; manganese was unearthed in the Pahranagat District of Lincoln County.

Explorations in the Gold Range District produced precious metals discoveries during the strategic metals period. Prospectors may have crawled over this area on the east side of the Belted Range as early as 1904. In a 1907 report, U.S. Geological Survey geologist Sydney Ball described the large area east and southeast of Belted Peak as "much altered," but no claims were recorded at Gold Range until 1926. A small–scale boom occurred there between 1930 and 1932. A townsite was laid out, and in early 1932 the camp boasted a population of about one hundred people. Miners sank two shafts and did a limited amount of drifting, but apparently produced nothing, in spite of reports of "splendid showings." There has been no activity in this district since its 1930s flurry.[7]

Clarkdale, a 1931 discovery west of Tolicha Peak, grew into a full–fledged rush in 1932. Even humorist Will Rodgers visited the district in September of that year. Clarkdale happened to be a combination of mineral deposit types. It had impressive iron–oxide–stained ledges like Goldfield, but its gold–silver ores were found in "true fissure veins" overlooked throughout the previous two discovery eras. Surprisingly, after all of its 1930s excitement, this camp probably produced less than 200 tons of ore and was abandoned by the 1950s. It is now within the U.S. Air Force's Nevada Test and Training Range (known until recently as Nellis Air Force Range), but there are rumors that at least part of the district may eventually be relinquished by the military.

Wahmonie, located north of Skull Mountain within the Nevada Test Site, may have been worked by Mormons in 1853. While there is no documentation of such Mormon activity, the Hornsilver Mine, mentioned in a 1905 field survey, is evidence of pre–1900 activity. High grade gold–silver ore was discovered in the area in 1927 and the camp named Wahmonie—the Shoshone word for gold—organized in 1928. Nevada financier George Wingfield, who made his first fortune in Goldfield, acquired an interest in the district in early 1928 and commenced sinking a 500–foot shaft to explore its surface showings. Apparently this project revealed nothing of value, and the camp died in 1929. The collar of the "Wingfield Shaft" can still be seen in Wahmonie (Fig. 9), but the town is unlikely to see any more

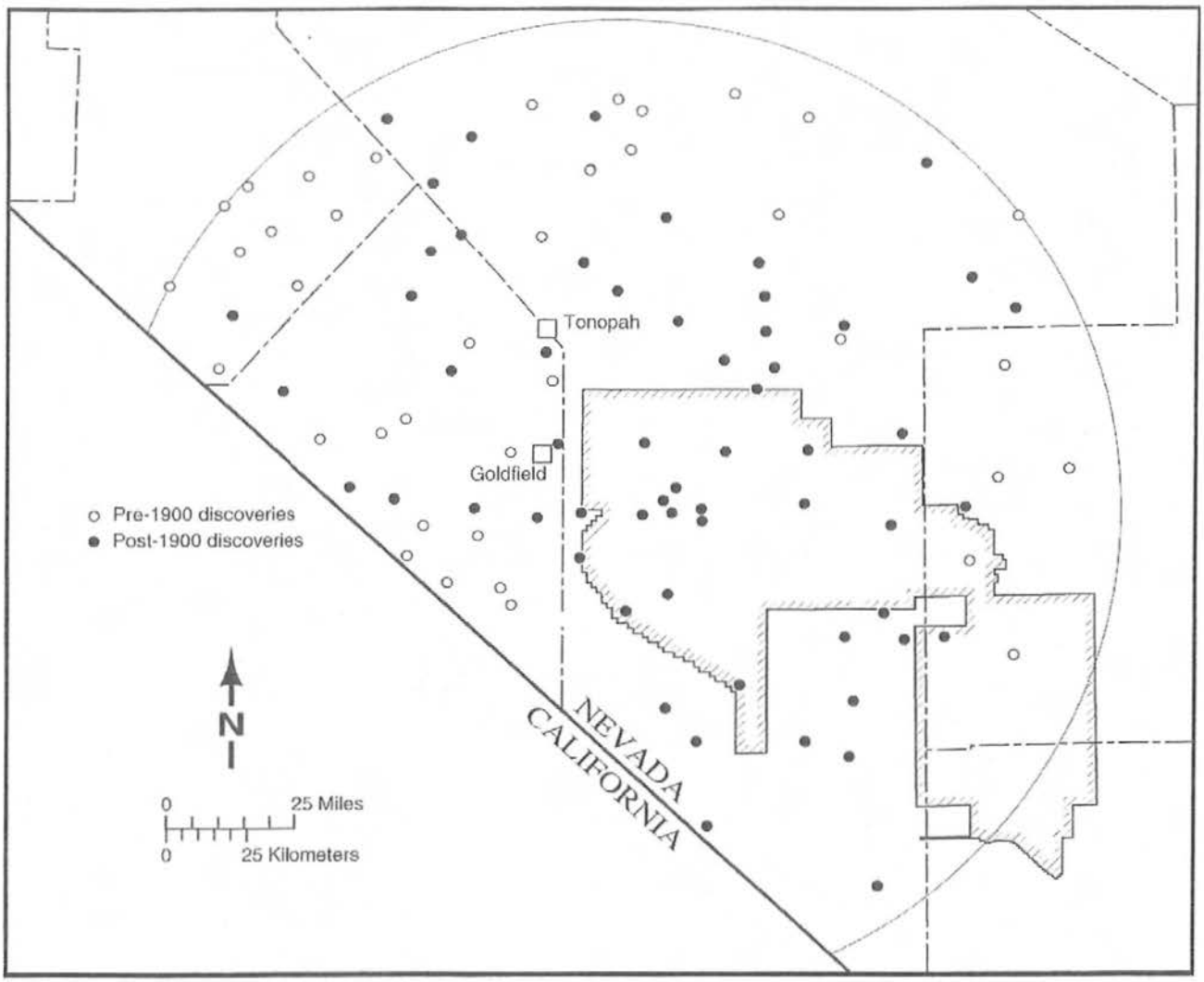

Figure 10: Comparison of discoveries made before and after 1900.

mining activity. Sometime in the 1950s or 1960s, an unknown amount of radioactive debris from a dismantled test reactor was dumped down the shaft—even the federal Department of Energy is unsure how much of exactly what lies at the bottom of the shaft.[8]

Jess and Hazel Mellan discovered gold at Mellan Mountain, about 30 miles east of Goldfield, in 1930. By 1932 a small camp had been established and work was progressing on a "mountain of ore." This "mountain" stands out by itself on the east side of Cactus Flat and was said to "remind one a great deal of Round Mountain in Smoky Valley." Mellan Mountain, only about 12 miles beyond Cactus Springs and surrounded by earlier camps, escaped discovery during the Goldfield boom years, possibly because it resembled neither the historic fissure veins of the Comstock type, nor the colorful and prominent ledges of Goldfield. Records show only about $1,000 in production from the district, and the camp, now within the Tonopah Test Range portion of the Nevada Test and Training Range, has seen no action since before World War II.[9]

The Legacy of the Twentieth Century Booms

The discoveries which occurred after the Tonopah and Goldfield booms left their mark on south–central Nevada. A comparison of the mining districts discovered before 1900 with those discov-

ered in 1900 and later demonstrates this legacy, showing thirty–eight pre–1900 discoveries and fifty–eight post–1900 discoveries (Fig. 10). Unfortunately, many of the districts southeast of Tonopah and Goldfield are within the Nevada Test and Training Range and are now closed to public access.

There have been more recent mineral excitements throughout Nevada. Intensive prospecting for uranium took place between 1948 and 1960, and another tungsten boom provoked interest in the 1950s. Discovery of the Carlin gold deposit in northern Nevada in 1961 set off the "invisible gold" boom that is still driving mineral exploration in the state. But these modern "booms" have not resulted in the establishment of new mining camps, only the intermittent reactivation of previously settled camps.[10]

Notes

1. F. L. Ransome, "The Geology and Ore Deposits of Goldfield, Nevada," U.S. Geological Survey Professional Paper 66 (Washington D.C.: U.S. Government Printing Office, 1909), 16.
2. Augustus Locke, "The Ore Deposits of Goldfield," *Engineering and Mining Journal* 94:17 (26 Oct. 1912): 797-802.
3. "Gold Crater Taking on New Life," *Goldfield Weekly News*, 29 Feb. 1908. "Gold Crater has Making of Good Camp," *Goldfield Weekly News*, 28 Mar. 1908.
4. "Gold Strike on Lease at New Camp of Jamestown," *Goldfield Weekly News*, 4 Apr. 1908. *Goldfield Weekly News*, 9 Dec. 1908.
5. Sidney Ball, "A Geologic Reconnaissance in Southwestern Nevada and Eastern California," *U.S. Geological Survey Bulletin* 308 (Washington D.C.: U.S. Government Printing Office, 1907), 111-4.
6. John Dorr, *Cyanidation and Concentration of Gold and Silver Ores* (New York, McGrawB Hill Book Co., 1936), 1-8.
7. Ball, "A Geologic Reconnaissance of Southwestern Nevada and Eastern California," 131. "Gold Range is now Attracting Many Prospectors," *Goldfield News and Weekly Tribune*, 28 Jan. 1932.
8. Ball, "A Geologic Reconnaissance of Southwestern Nevada and Eastern California," 147. Jack Quade and Joseph Tingley, "A Mineral Inventory of the Nevada Test Site and Portions of Nellis Bombing and Gunnery Range, Southern Nye County, Nevada," *Nevada Bureau of Mines and Geology Open-File Report 84-2* (Reno, Nevada: Nevada Bureau of Mines and Geology, 1984), 31-4. See also: Joseph Tingley, et al., "Mineral and Energy Resource Assessment of the Nellis Air Force Range, Clark, Lincoln, and Nye Counties, Nevada," *Nevada Bureau of Mines and Geology Open-File Report 98-1* (Reno, Nevada: Nevada Bureau of Mines and Geology, 1997).
9. "Mining Activities East of Goldfield," *Goldfield News and Weekly Tribune*, 15 Apr. 1932.
10. Larry Garside, "Radioactive Mineral Occurrences in Nevada," *Nevada Bureau of Mines and Geology Bulletin 81* (Reno, Nevada: Nevada Bureau of Mines and Geology, 1973), 1-5. See also: Joseph Tingley, "Mining Districts of Nevada (second edition)," *Nevada Bureau of Mines and Geology Report 47* (Reno, Nevada: Nevada Bureau of Mines and Geology, 1998). Walter Frickstad and Edward Thrall, *A Century of Nevada Post Offices, 1852-1957* (Oakland, California: Frickstad and Thrall, 1958).