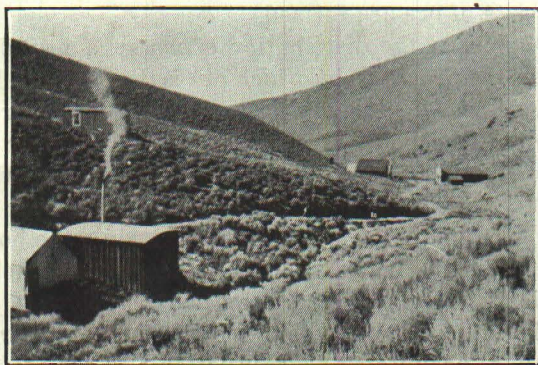


Kimberly, Nevada.

Written for the MINING AND SCIENTIFIC PRESS
By JAY A. CARPENTER.

The mining camp of Kimberly which has sprung into prominence in the last few months, is in the Battle Mountain district. This district is receiving considerable attention on account of favorable showings of copper, lead, gold, and silver ores, the result of development work carried on consistently for many years. The presence of iron ores and limestone in addition to the copper ores offers favorable conditions for smelting. There have been small but



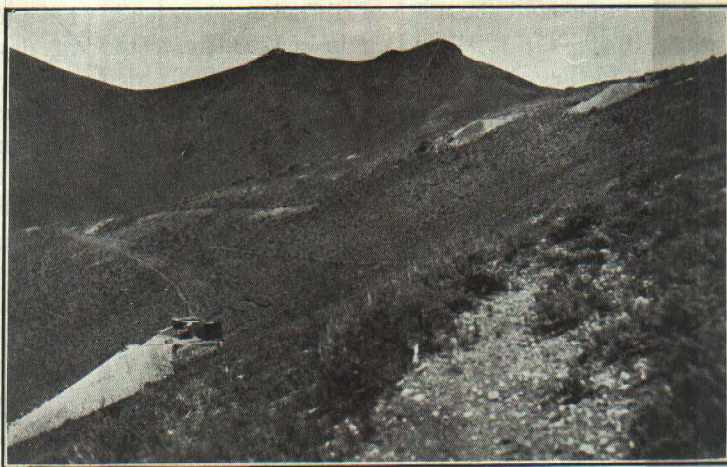
Kimberly, Nevada.

steady shipments of carload lots of gold and silver ores to the Utah and California smelters. However, it remained for the discovery of Bannock with its rich free-gold ores on the very surface to attract marked attention to the district. Bannock has settled down to solving the question of the depth and nature of its ore deposits, and attention is now centering upon the camp of Kimberly.

Kimberly is 18 miles southeast of Battle Mountain, 10 miles of this distance being over valley road and the last 8 being a steady climb up a winding canyon. The camp, consisting of several large frame buildings, cottages, and tent-houses, lies at the intersection of two gulches at an elevation of 6500 ft., while the mine workings are along the crest of the ridge to the west, and 300 to 400 ft. higher. For years the few prospectors' huts at this convenient watering place on the country road were known as Marble City. An abandoned stone hut and a 40-ft. inclined shaft dates back of the memory of any local resident, perhaps back to the days when the wealth of Austin allured the prospector to the mountains of Lander county, for the ore in the incline shows a high lead-content and a high ratio of gold to silver, while the free-gold surface-showings were evidently undiscovered. In 1907 prospectors encouraged by the surface 'pannings', discovered wire-gold in places not over 300 ft. from the old shaft. Other discoveries along the crest followed, and in 1908 the camp had a lively boom, being known as Hilltop. Although 1908 was a dull year, the control of the stock in the two main companies was quickly placed under option at fancy figures. On both properties development was

limited to the main discoveries. On the Hilltop property a large open-cut was made in following the gold stringers, and exceedingly rich ore was shipped in small lots. A tunnel at a depth of 70 ft. failed to find rich ore, and the option was dropped. On the Independence claim of the Philadelphia Western Mining Co.'s ground an incline shaft following the vein was sunk 180 ft., connecting with a 265-ft. tunnel. From this work about \$15,000 in rich shipping-ore was taken from one lease. However, the promoters lost their option through holding for too high a figure. These failures caused the camp to recede from public notice.

The owners, able to keep but a few miners at work, divided their ground into lease-blocks, and many of the men went from day's pay to leasing, attracted by the surface-showings. When a miner can guide his work by a few minutes with mortar, pestle, and pan, and a few encouraging colors are found, his energy is unrelenting and his faith unbounded. It is the showing made by these lessees that has brought the camp again to public notice. They have found high-grade ore in several leases on the two main properties and on a claim 1500 ft. to the west, and they claim to have opened large quantities of milling ore. Already the control of the Hilltop and Independence groups of claims, and the Golden Rule claim to the west, have been contracted under option to one group of capitalists, who are now rushing the construction of a 20-stamp mill, and are building wagon-roads to the dumps and working places. The mill-site is a half mile west of the town in a gulch between the Hilltop ridge and the Golden Rule claim. Water for milling is to be obtained by pumping from Indian creek some 3000 ft. down the gulch. The 20 stamps



Main Workings on Independence Claim.

are to be followed by amalgamating plates, and concentrating tables. The ore will readily yield 90% by this treatment, over 80% being obtained by amalgamation. Cyanidation of the tailing will hardly be attempted on account of the probable low value and a small copper content. The building of the mill and the short life left to the leases have stimulated work, and the camp has a thriving appearance.

The general geology of the district is that of prominent ridges of quartzites and silicious shales, much faulted and irregular in strike and dip. The general strike is north and south and the dip 45° or greater

to the west. The quartzite occurs both as an easily fractured light-colored variety, and a very massive, dark variety. The quartzite is formed of corroded quartz grains which have been largely replaced by a mixture of secondary quartz and sericite. The quartzite has evidently been subjected to considerable metamorphism since its formation. On the Hilltop ridge are wide dikes of an altered andesite, having about the same strike but less dip than the quartzite. This material is so badly weathered that it is only in some of the fresher specimens that a few of the lime-soda feldspars remain sufficiently unaltered to be recognized. The other original minerals have disappeared. At present the feldspars are replaced by sericite and kaolin while pyrite and quartz make up the remainder of the rock. A diorite porphyry also outcrops at the east base of the ridge, and can be traced through the camp and a half mile to the eastward. This diorite is a fresh looking rock, though altered. It contains large porphyritic crystals of andesine. Outlines of mica and hornblende remain, but the original minerals have been entirely replaced by chlorite, magnetite, and calcite. Tourmaline crystals are present and this unusual association may indicate a slight amount of contact-metamorphism. At some distance from the camp are prominent ridges and masses of granite. At the south end of one of these ridges, $3\frac{1}{2}$ miles to the east of the camp, is the Grey Eagle mine, an old lead-producer.

Four miles to the west, on the north flank of Blue Dick, a prominent peak, is the quartzite ridge from which the Dean mine extracted a large amount of milling ore through a period of years. On an intermediate ridge is the Maysfield property, an old producer. On the Hilltop ridge the quartzite is also the ore-bearing formation. The ore of the camp in general is fractured quartzite, cemented with quartz, and carrying free gold. The veins or orebodies as a rule are rather sharply defined from the quartzite, but are irregular in width and course, the course being in general parallel to the bedding plane of the quartzite. The wide dikes of the andesite are barren except for a small but constant gold content. The only appearance of the andesite in connection with the ore is in the form of tongues in the veins.

There are interesting variations from this general description. On the Hilltop open-cut the gold occurs in a coarse state, directly in the dark brown quartzite, with little or no apparent vein-formation. At times well crystallized covellite is found associated with the gold. On one of the leases on the Independence group is the odd occurrence of minute leaf gold and turquoise lying together on the fracture faces of the quartzite. On the main workings of the Independence claim lead minerals are closely associated with the ore, occurring both as cerussite and galena. The cerussite is well disseminated through the ore, while the galena is segregated. The richest gold seams lie next to the galena, but not in the galena itself. As a whole the district is interesting, and the advent of capital for deeper development will give the mines a fair trial. The rock determinations for this article were made by J. C. Jones, assistant professor of mineralogy in the Mackay School of Mines, at Reno, Nevada.

Diaphragm Cones and Tube-Milling.

Written for the MINING AND SCIENTIFIC PRESS
By WALTER NEAL.

Numerous references have recently been made to the invention of W. A. Caldecott known as a 'diaphragm cone'. As all of these have referred to work done on the other side of the world, a brief description of the apparatus as used in the mills of the Cia. Minera Las Dos Estrellas, and some experiments made with it as a thickener before tube-milling, will be of interest.

The apparatus is described by its inventor as a "classifier of the conical type * * * kept filled

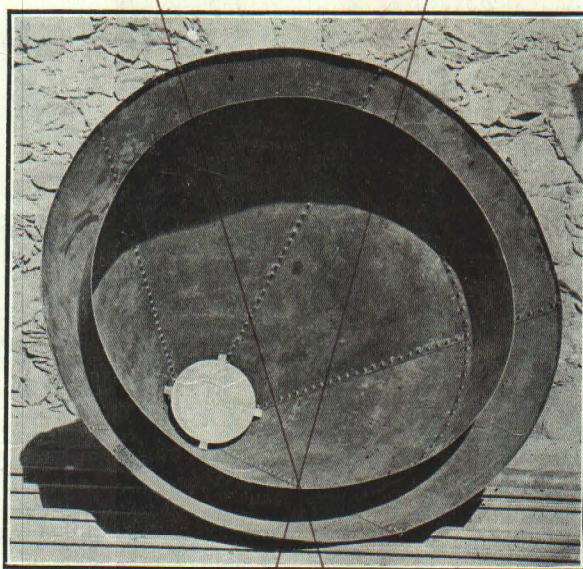


Fig. 1. Filter Cone.

nearly to the top with sand, and an essential patented feature of its successful operation consists of an internal serrated or notched horizontal disc-diaphragm near the bottom."*

As used at Dos Estrellas it consists of a circular sheet-iron plate, supported toward the apex of an ordinary cone-classifier by two straps riveted to the plate, and having their ends riveted to the sides of the cone, leaving an annular space between the plate and the sides. The width of this annular space, and the height of the diaphragm above the apex of the cone, vary with the size of the cone and the tonnage and character of the pulp. So far as my experience goes these points are best determined experimentally although with sufficient data, doubtless some approximate formula could be deduced. A cast-iron plug-cock at the apex provides a means for regulating the underflow.

When starting operation this cock is closed, and the pulp is turned into the cone. Sand is allowed to collect until it is within about 10 in. of the overflow. The cock is then opened enough so that thick sand may issue at the same rate that it settles out of the thin pulp flowing into the cone.

The settled sand, on account of its thickness,

*Journal of the South African Association of Engineers, Dec. '08.