Historic Maps in K-12 Classrooms Environmental History – Map 8 Mining in South Dakota, 1878

## Janin's Report

In *Caledonia Gold Mining Company – Reports of Mining Engineers*. San Francisco, CA, 1879. Newberry Library call number: Graff 4936

## J. W. GASHWILER, ESQ.,

Dear Sir: At your request, I add a few remarks to the statement of Messrs. Rigby and Simmons, and give therein the results of my own frequent examinations of the property of the Caledonia Mining Company.

The gold mines of the Whitewood Mining District have already become widely known, but they are destined to attract much greater attention in the future. The peculiarity of the geological formation, the immense width of the ore belts, the many facilities which enable the mining and the reduction of the ores to be conducted with great economy, and the fact that all the leading claims are already, or soon will be, dividend-paying, will all tend to make this a favorite field for mining investments; and there is no claim in the "Hills" which holds out greater promise than the Caledonia, if we may judge from the results already obtained from a comparatively small amount of prospecting.

The veins of this district are among the oldest on the continent. They occur in slates which are covered, unconformably, by layers of Silurian sandstones, and these, again, are overcapped by carboniferous limestones. Dykes of a highly siliceous felspathic -porphyry have burst through the slates in the immediate vicinity of the veins, and they have also penetrated and overflowed the sandstone and the limestone. In fact, these dykes are post-cretaceous in age.

The stratification of the slates is, speaking generally, west of north, and south of east. They have a northeasterly dip of about fifty degrees. The gold is sometimes found in sulphurets; but, as a rule, it occurs as fine gold either in veins of quartz, which are parallel to the stratification, or in belts of inter-laminated quartz and slate; and, in this latter case, it is as much in the slate as in the quartz itself. The gold is remarkably free, and the ore yields a much higher percentage of its assay value than is usually the case in the mines of California.

The "Caledonia" is situated in a belt of veins which runs about parallel with the belt whereon are situated the mines of the Homestake, Terra and DeSmet Companies. The two belts – if, indeed, they are not parallel parts of one grand ore-bearing zone – resemble one another in many particulars; but the one on which the Caledonia is situated is more overlaid with sandstone and porphyritic debris, and has, in consequence, been less developed. Enough has been done, however, to prove its continuity, both north and south, and to show that it is ore-bearing for a long distance.

The three locations belonging to the Company, namely: the Caledonia, the Queen of the Hills, and the Grand Prize, embrace all that is best known of this belt: and the extent of the claims is so great that a considerable time must elapse before it can be thoroughly prospected. Three veins have already been cut by one of the tunnels on the claim, namely: the Discovery vein, the Blind Lode, and the Caledonia. The first has now a width of 6-8 feet; the second a width of 14 feet; and the third has a width of 50 feet already developed; and the further, or East wall, has not yet been reached. These three veins (as they may here be termed for convenience), are distinct as far as they are known; but their true relation to one another can only be determined by deeper work.

The work that has been done may be briefly described as follows:

- 1. An open cut on the surface, and a drift therefrom.
- 2. The Grand Prize tunnel, which cuts into all the ore bodies, and from which the main, or Caledonia vein, has been prospected over a length of more than 300 feet.
- 3. They Lower tunnel, which must be driven a further distance of, say, 130 feet, before it reaches the main body.
- 4. Some shafts and winzes.

These works are described in sufficient detail in the report of Mr. Rigby.

The results obtained were as follows:

- 1. The Discovery vein was found to yield, from ore near the surface, a product of \$5 per ton. The news has just been received, however, that a winze down on this ore has come into ore which will readily yield \$8 per ton.
- 2. The Blind Lode, which in depth, will probably unite with the Discovery Lode, yielded a product of \$6 per ton.
- 3. The Caledonia Lode, which shows certain peculiarities owing to a folding or bending of the strata, has been found to contain: (a) a seam some 12 feet in width, of very rich ore ; (6) a much broader band, which if worked separately, would yield from \$9 to \$12 ; and (C) a total known width of 50 feet of vein matter, with a developed length of over 300 feet, which has yielded an average of \$7 per ton. This yield was from a mixture of all classes of ore good, bad, and indifferent that was extracted from the surface, from the lower level with its drift and from the shaft connecting the two.

The yields of the different lots worked in the Company's mills have varied from five dollars per ton, to twelve dollars per ton, according to the locality of the ore. There has been no attempt made to so work the mine as to "make a show." The system adopted by Mr. Rigby is, in my opinion, the correct one; that is, to extract all ores that will pay a profit as they are encountered, and not attempt to keep up a high average yield by opening stopes upon the better seams only. It is the system that must be finally adopted by all the companies in the Hills. The value of the mines in this district consists in the great abundance of comparatively low grade ore, which can be cheaply mined and milled. The yield of the best ores in the camp, worked in quantities, has varied from \$7.50 to \$12 per ton; but the average yield of many of the mines, has been under \$9.

The larger companies are fast erecting mills of very large capacity, that they may be able to handle ores of a lower grade with the same profit that they now derive from a higher yield.

The great abundance of ore which has already been developed in Caledonia Company's claims, and the assurance of a further development by means of their lower tunnel, which will greatly enlarge their reserves, already warrant the immediate erection of a large mill – one of not less than sixty stamps. This mill must be erected in the immediate vicinity of the mine. Its costs will be from \$50,000 to \$55,000, and the profits to be derived from the ore already developed, should not only pay this cost, but should also pay many dividends.

The cost of mining and milling the ore will vary from time to time; but all the ore that shall be developed above the lower tunnel should be extracted and milled for \$3 to \$3.50 per ton. The average yield of all ores worked is given by Mr. Rigby at \$7.70 per ton. Taking this as a basis of calculation, the profit, per ton, from such a mill as I have mentioned, would be fully \$4. The capacity of a sixty-stamp mill should be at least 3,000 tons per month, and might reach 4,000 tons. If we assume the former figure, the monthly profit should be at least twelve thousand dollars.

As to the total value of the reserves which are now developed, I must refer you to Mr. Rigby's statements. My own, final examination was concluded about the 20<sup>th</sup> of the month of February. The prospecting drifts since that time have been constantly increasing the extent of

the reserves; and Mr. Rigby's estimate, which, from the figures he gives, appears to be conservative, places these at 125,000 tons. Of course this quantity may be very greatly increased by the developments which we may confidently anticipate in the lower tunnel.

Respectfully, LOUIS JANIN, M. E. SAN FRANCISCO. April 18th, 1879.