

REPORT
on
CANTERBURY TUNNEL

by
J. M. Kleff

Jan. 1, 1928

Report furnished by J. M. KLEFF, Leadville, Colorado.

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(1) The Canterbury Tunnel, operated as a community enterprise by citizens of Leadville, has been extended to a point 4172 feet from the portal and 870 feet below the surface. In addition to the main tunnel, cross-cuts and raises to the amount of 2300 feet have been driven. Connections have been made with the Roseville and Minneapolis shafts situated near the line of the main tunnel and drainage of these properties has been effected thereby.

The portal of the tunnel is located two miles north of the City of Leadville, on the westerly slope of Canterbury Hill, a spur of Prospect Mountain, at a point about 1,200 feet from the Arkansas River and 85 feet vertically above the bed of the stream. The sea level elevation of the portal is 10,077 feet. The direction of the tunnel is S. 61° 27' E., cross-cutting the general direction of the main fault systems of Leadville.

The main bore, 5 x 7 feet in the clear, is driven on a straight line and on an even grade of one-half foot in a hundred. First class timbering has been done where necessary and a wooden flume under the floor of the tunnel serves to carry the water. An Ingersoll Rand Compressor of 500 cubic feet per minute capacity supplies air for drilling. The full equipment of tools is supplemented by an Ingersoll Rand Compressed Air Drill Sharpner. Electric power is furnished by The Public Service Company of Colorado.

Heavy flows of water have been encountered from time to time, the maximum of 12,000 gallons per minute having been recorded. During the last two years the flow has remained practically constant at 1300 to 1500 gallons per minute.

GEOLOGY

Because of the absence of extensive deep mining development on Canterbury Hill, detailed geological information is meager, hence it is not possible, in the light of present disclosures, to show the exact positions of the sedimentary formations and the irregular intrusive porphyries lying between the tunnel and the surface. However, the general geological features are very clearly indicated by surface croppings and numerous shallow shafts. The maps and sections accompanying the report of the United States Geological Survey on the Geology and Mining Industry of Leadville, By S. F. Emmons, show that the formations of Leadville are present in Canterbury Hill and are found in their regular sequence as follows:

1. Weber Grits and Shales,
2. White and Gray Porphyry.
3. Blue Limestone (Carboniferous)
4. Parting Quartzite
5. White Limestone (Silurian)
6. Cambrian Quartzite.
7. Pre-Cambrian rocks.
8. Also intrusive porphyries cutting all formations.

The reader is referred to the several geological sections that have accompanied past annual reports of the Company. These sections were made for the purpose of showing the various geological formations and contacts that have been disclosed in the tunnel; also the relative position of the surface of Canterbury Hill directly above. The tunnel reaches solid formation after going through 1230 feet of glacial material; then after passing through 240 feet of Gray Porphyry it cuts 190 feet of silicious Blue Limestone and quartzite beds dipping steeply to the south and intersected by numerous fault slips. The next 50 feet of the tunnel discloses a well pronounced and apparent extensive fault with upthrow on the east side. This fault is presumed to be the northerly extension of one of the main faults of Leadville. East of this fault the position of the tunnel for its entire length has been successively above and below the contact of the Cambrian Quartzite and White Limestone, but not departing far from this contact at any time. At a point of 180 feet back from the present breast the tunnel encountered a second well pronounced normal fault, having a down-throw on

the east side, and probably being the extension of one of the north-south faults of Leadville.

The tunnel has passed through numerous water courses in the White Limestone. Assays from frequent iron stain slips have shown small amounts of gold, silver, lead and zinc. At a point 2750 feet from the portal, the tunnel encountered a small vein on the Sifter Claim. A limited amount of drifting and raising was done on this vein and some ore was produced and shipped, however, these operations had not yielded a profit up to January, 1928 and, in view of the Company's limited finances, it was decided to defer further prospecting work on the Sifter vein and to expend all income in extending the main tunnel, in order to fulfill lease agreements made with owners of favorable mineral areas lying ahead of the breast of the main bore. The disclosure of even a small amount of ore in the Sifter vein at practically the bottom of the ore bearing series is considered quite significant of the possibilities of the existence of larger amounts of ore in the Limestones at elevations higher geologically; further prospecting work in this section is amply justified.

A study of the geological sections referred to above together with the known history of the occurrence of ore in neighboring areas reveals the fact that the Canterbury Tunnel is advantageously situated for economical exploration of the Blue and White Limestones, these formations having yielded the greater bulk of Leadville's past mineral production.

As to the drainage possibilities, the tunnel if extended, or laterals therefrom, would cut the Harvard shaft at 380 feet below the surface, the Mammoth shaft at 600 feet, the Cleveland shaft (extended) at 1,070 feet, and the Dolly B. shaft (extended at 1,025 feet or 240 feet lower than the Yak tunnel.

Since the beginning of work early in 1921 the Canterbury tunnel has been operated by the Leadville Mine Development Company, an organization composed of Leadville mining and business men who have served gratuitously in the management and direction of the operations. The company was formed for the purpose of prospecting and developing such areas adjacent to Leadville's productive section as were known to possess similar geological features. As a first venture the Canterbury Hill Prospect Mountain area was chosen because of its encouraging mineral indications as shown by former work in the many comparatively shallow workings. Heretofore, excessive amounts of water had discouraged the exploration of this area to any extent commensurate with its mineral possibilities. Funds for financing this enterprise have been derived from the sale of stock, eighty per cent of which has been purchased by citizens of Leadville.

As a result of careful supervision on the part of the Officers of the Company, the Canterbury Tunnel is not only a model of tunnel construction but also a permanent asset to the area which it will serve.

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