

REPORT ON LIMEROCK DEPOSIT AT GLENBROOK RANCH

Douglas County, Oregon

by

L. G. Hicks

1915

C. R. Shipman, Esq.
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Oregon

Sir:

Pursuant with your request, I have made an examination of the limerock deposit on your Glenbrook Ranch, and beg to report as follows:

Location

The outcrop of limestone examined is located in the NE $\frac{1}{4}$ of the SE $\frac{1}{4}$ sec. 20, T. 30 S., R. 6 W.W.M., in Douglas County, Oregon (See Map. Fig. I).

This deposit is approximately 1 mile north from the main line of the Southern Pacific Company, which passes in an easterly and westerly direction through Glenbrook Ranch.

There is a side track already constructed at the ranch and passenger trains stop on flag. The station is known as Cornutt on the railroad literature.

The following table gives the distances from market towns, both north and south of Cornutt. (List omitted)

Topography of Location

On leaving the railroad at Cornutt station, one passes across a practically level field which brings us to the head of Rail Gulch. I am told that there is an old wagon road up Rail Gulch, which can be followed until about due west of the limestone deposit. From this point a climb of a few hundred feet brings one to the top of the ridge and the deposit. Or, if one wishes a less steep climb, by following Rail Creek about one-quarter mile and then turning to the right and following up the gradual slope for a distance, then turning to the left slightly, a very gradual climb to the top of the ridge is made.

The limerock deposit as opened up is practically on the top of the ridge between Rail Creek on the west and a small stream on the east. This latter stream

goes dry in the summer, while Rail Creek, at the time of examination, July 9, 1915, had a discharge of about one second foot of water.

The elevation of the U. S. Geological Survey bench mark which is 60 feet west of the prune dryer, is 722.104 feet above sea level. The elevation of the top of the ridge on which the deposit of limestone has been uncovered, is approximately 1300 feet above sea level, a raise of about 578 feet in approximately 1 mile of distance, which means about an 11 percent grade. However by developing somewhat, this grade can be reduced to possibly 8 percent.

Section 20, in which the limestone deposit is located, has a difference of elevation between the southeast corner and the northwest corner of 1500 feet.

Rail Creek heads in the NE $\frac{1}{4}$ sec. 20 and flows in a southwesterly direction through the SE $\frac{1}{4}$. To the west of Rail Creek a ridge extends to the south and east the ridge on which the limestone has been uncovered, is found. This latter ridge has a northeasterly and southwesterly direction and is quite narrow at the top.

This ridge and others in this vicinity are outlying spurs of Nickel Mountain, which has an elevation of 3533 feet above sea level.

Work Done

Some years ago, an open pit was excavated in the NE $\frac{1}{4}$ of the SE $\frac{1}{4}$ sec. 20, on the apex of the ridge. This pit was, no doubt, sunk on an outcrop of the limestone, with a depth of about 5 or 6 feet the main body of the rock was uncovered but the prospectors were apparently unsatisfied as little work was done after this. Lately several charges of powder have been set off under the limestone in the bottom of this pit to determine if the rock is in place or not, but so far the indications, have in my opinion, disclosed nothing to say definitely that the rock is not in place.

A short distance south of the above mentioned open cut, a cross cut trench has been dug in an easterly and westerly direction across the ridge to uncover, if possible, the limestone. This trench was dug some years ago but has caved in so badly that the bottom could not be examined to see if the limestone was actually uncovered or not. Limestone float was found alongside of the trench but I am not certain that this came from the trench.

A number of large limestone boulders are also found south of the open pit which are badly weathered and came, I believe, from the original outcrop which was located where the open pit was sunk. I am informed that many years ago some limestone was burned in this vicinity and that the limestone consisted of the boulders picked up from this locality.

A wagon road was partially constructed below the cut and open pit. This road leads to the valley below. Another cut was made in the side of the ridge on a level with the road. This cut is in a clay and shale formation and whether it was made to prospect the limestone or whether for a site for a kiln could not be ascertained. The shale in the clay bank gives a slight lime reaction.

Geology of Limestone Deposits in Douglas County

Limestone deposits in Douglas County are found in cigar or lens shaped masses, some as narrow as 15 feet and with a length of from 1 or 200 to 1800 feet long. These deposits occur in belts which have a general northeasterly and southwesterly direction.

These deposits are designated by J. S. Diller of the U. S. Geological Survey, as "Whitsett Limestones."

From the first outcrop on Buckhorn Creek in sec. 14, T. 27 S., R. 4 W. to the sixth deposit in sec. 30, T. 28 S., R. 5 W., the country rock is of the Myrtle formation, consisting of conglomerates, thin bedded sandstones, and shale. In

speaking of the six deposits of limestone it is not to be understood that there are not more than six deposits, but I refer to the six largest and most prominent masses of limestone so far of record.

Local Geology

As I have stated before, the ridge on which this deposit of limestone is found is a spur of Nickel Mountain. G. F. Kay, in U. S. Geological Survey Bulletin 315, at page 120 says, "Nickel Mountain is a few miles west of Riddle and is composed of peridotite, which is partly changed to serpentine. The olivine of the peridotite appears to be nickeliferous."

An examination of the formation, starting at the bed of Rail Creek on the west side of the ridge and working up the side of the ridge in an easterly direction over and across the top discloses the following geological formation.

In the basin of Rail Creek Gulch the formation is a medium conglomerate, intermixed with gray and yellowish sandstones.

From the bed of the creek to the top of the ridge the formation is a fine grained gray sandstone, which is fossilized, a specimen of what I should class as *Aucella piechii* being found.

Between the sandstone and the limestone, an altered shale is found.

Inasmuch as the greater part of Nickel Mountain is serpentine, the contact between the intrusive and sedimentary rocks must take place a short distance north and east of the point where the limestone has been opened up.

A short distance north of the open pit a gray lime sandstone is found outcropping and to the south, a distance of a few hundred feet, an outcrop of conglomerate is found. To the west of the ridge on which the open pit is located the fine grained sandstone is again found.

About one-half mile south of the pit, thin bedded sandstones are found with a northerly and southerly strike and a dip to the east. Close by several boulders of a very hard intrusive rock were found.

Extent of Limestone Deposit

Unfortunately the limestone has not been very extensively prospected. The open pit mentioned has alone disclosed the actual lime rock. I am inclined to believe that the extent of the deposit is as shown on Figure 3, that the bed is almost on edge and that it has a comparatively narrow width.

The deposit may continue with from 5 to 10 feet of overburden both north and south along the ridge. It will be necessary, before much knowledge can be obtained as to the extent of the deposit to systematically prospect the ridge as follows:

First: To prove conclusively that the limestone is actually in place. This to be done by sinking a shaft from the bottom of the main open pit.

Second: A cross cut trench should be carried from the top of the limestone as now uncovered in the pit, both east and west across the ridge. This cut will probably disclose the width of the bed.

Third: A shaft should be sunk about 75 or 100 feet north of the open pit to see if the limerock can be opened up.

Character of Limestone Found

The limestone uncovered at the open pit is a massive, crystalline grayish white body, very hard, showing a few streaks of calcite. The upper surface of the rock has imbedded in it a quantity of small black pebbles and the surface shows a sedimentary deposit with water action.

Samples of the limerock that have been heated in a blacksmiths' forge have turned white the chemical action being as follows:

Calcium carbonate (CaCO_3) plus heat, equals lime (CaO) plus carbon dioxide gas (CO_2).

On being placed in water, these burned samples immediately slack down to a white putty showing that the following chemical action has taken place: lime (CaO) plus water (H₂O) equals calcium hydroxide Ca(OH)₂.

While a complete analysis of the limestone for silica, magnesia, lime and iron has not been completed, yet tests so far indicate that the percentage of lime will run approximately 90 percent or better.

Practically all limestones contain impurities, the more common of which are as follows: (Rest of report omitted from original).

OWNER: E. M. Hammersley, Riddle, Oregon

LOCATION: Sec. 20, T. 30 S., R. 6 W., at Riddle Station, cross tracks, and turned W-SW on N. side of tracks, to first road grade crossing with R.R., 2.8 miles from Riddle; before crossing tracks, go thru gate straight ahead, then along unimproved road, still on N. side of tracks, following it thru 2 gates, 1.75 miles to Hammersley place.

AREA: Deeded land.

DEVELOPMENT: A small pit is open about 100 yds. N. of house. It is about 8 ft. square and 3 ft. deep.

HISTORY: It is reported that a small amount of lime was burned for local use. Not over 5 cubic yds. could have been removed.

GEOLOGY: According to Riddle folio, there is Umpqua formation, serpentine, and greenstone. Field study indicated a heterogeneous mixture of pebble conglomerate (basal Umpqua?), some serpentine and meta volcanics, with some silicified diorite, in which are masses of large, impure, calcite crystals and more massive calcareous material. It is obvious that the local area is one of landslide, from a steep hillside just S.E.

The limestone, as exposed, appears to be a series of irregular masses, many of which contain inclusions of meta-volcanics. Diorite bounds it on the S.E. Some of it is well crystallized calcite. It looks like vein calcite rather than depositional limestone. It is doubtful if the limestone is pure enough for commercial burning even if the quantity were sufficient, which is doubtful.

The nature and position of the limestone, the heterogeneous occurrence of serpentine, conglomerate, meta-volcanics, and diorite as boulders, and, the landslide topography suggests that a pod, or

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vein of calcite originally occupied some portion of the "country rock", probably in the meta-volcanics. Subsequent landslide thoroughly broke the rock and slumped it to its present location.

Even if the original calcareous pod was of commercial size, the landslide has so thoroughly mixed it with slump material that it is doubtful if a workable body could be found at this point.

INFORMANT: Ray C. Treasher, accompanied by E. M. Renfro, Myrtle Creek, Oregon, 9/13/40

REPORT BY: Ray C. Treasher, 9/13/40

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I suggested to Renfro that if this material were to be used, the only method I could see would be a very small operation, by which the calcareous masses would be recovered in the owners spare time,--as such the labor item would be of no value. That a very small kiln might be used for very local markets of burned limestone, or ground limestone for fertilizer.

The deposit justifies no commercial or semi-commercial development as there is no way to predict quality or quantity and the ultimate amount of limestone recoverable will be small.

I further suggested to Renfro that the owner search non-landslide areas along the general Umpqua (?) --serpentine contact for further expression of this calcite vein in place.

Ray C. Treasher
Field Geologist
Friday, Sept. 13, 1940