

Stinson
Denton

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(229)
Item 2

MAGNESIUM DEPOSITS OF THE PARADISE RANGE IN CENTRAL NEVADA.

The title chosen as magnesium deposits as there is present both brucite ($Mg(OH)_2$) and magnesite ($MgCO_3$) as well as hydromagnesite $3MgCO_3 \cdot Mg(OH)_2 \cdot 3H_2O$. are present. Limited to the Paradise Range as there are several other magnesium deposits, some of economic importance, in the State.

Old mining camps of Lodi, Downeyville, and Ellsworth are grouped together into them Marble District because some marble is found in the metamorphosed limestones of the region. These deposits are on the lower part of the western flank of the Paradise Range in northern Nye County, about 35 miles north, and somewhat east of Euning and about 165 miles, about due east of Reno, and 35 miles south of Middle Gate which is 50 miles east of Fallon on Highway 50.

In 1920's Harry Springer located scheelite claims near dikes cutting sediments about $1\frac{1}{2}$ miles northeast of present brucite quarries. Optioned to Tonopah Mining Company who drove a tunnel, at about 200 feet depth to cut contact, at 200 feet the ~~lime~~ dolomite, or marble was too tough so option was relinquished. On going to claims from his camp near a spring he crossed some soft white material and a smaller outcrop of peculiarly weathered hard white bony-looking rock.

In Nov. '27 Springer sent some of this material to the Geol. Dept. of the Southern Pacific at San Francisco and Gus Seilaff reported it to be the magnesian hydrate Brucite with hydro magnesite.

Claims were located in December and Springer was joined by McLure Turnbaugh, Southern Pacific men to develop the claims. JAC visited the property during the Christmas vacations and took samples and an option. Arrived in Reno and contacted Pres. of American Magnesium Company who replied that they were not interested. However in 1930 they sent a geologist to examine the deposit.

In 1928 it was visited by many engineers but none of them were impressed because they could see no advantage of this material over other magnesian materials then available. Professor Carpenter carried on experiments with it in an attempt to make Sorrel cement.

In 1929 Carpenter made several trips to the property and took many samples in examining the property for the T A T. He reported that the area merited drilling. He took samples of the adjoining material which he thought to be limestone. One sample ran almost pure $MgCO_3$ with but little CaO and cautiously reported that this material was higher in MgO than normal dolomite. Suggested to Springer that the deposit be located as a placer.

Suit against Springer by engineer who located placer over it. Wrong corner surveyed from.

1930. Standard Slag took it over and did much diamond drilling and an analysis of the cores indicated the extent of the magnesite and its high purity but during the depression they gave up the property. And although they developed an enormous tonnage of magnesite they were particularly interested in brucite because of its higher MgO content 69% vs 48% in $MgCO_3$ or Mg content of 41.4 vs 28.6. This allows shipment to eastern points and it also has some advantages over magnesite for steel furnaces.

I first saw property in 1931 spent 2 days there

Springer organized a new company and carried on. In 1933 the U. S. Geol Survey and Nevada State Bureau of Mines put out bul. by Callaghan

2/ showing 3 million tons of brucite and at least 8^{mil} tons of magnesite. But what use was it. This publication helped to call attention to the property to many people. ^{on 20 acres}

1936 the Basic Dolomite Inc took over (now Basic Magnesium Co.) and made small shipments over poor roads and closed down in the winter.

In 1938 new road constructed and shipments continued in 38, 39, 40, of about 40 or 50 tons daily.

Standard Slag bought Browns claims to east for magnesite ~~and with~~ ^{against} U. S. Brucite started suit to recover cost of diamond drilling and development. Also threatened an apex suit. Dropped.

Spent some time with Brown, who had lead zinc claims, early in 1933 investigation earthquake with Callaghan.

Alex Ransom interested Ott Heizer in scheelite claims and these were bought by Segerstrom of Sonora Pres. of Nevada Massachusetts Tungsten Co., operators at Mill City and Golconda, for many years leading producer of tungsten in the U. S. They advances the lower tunnel a short distance and gave it up. Going to the surface they sent two long drill holes to the supposed contact and found no scheelite so shut the property down.

March 41 Charles E. Schwab.

In April 41 Permanente Company became interested and the Westvaco bought the tungsten ground from Segerstrom. I suggested this ground to Permanente.

~~Now estimated that there is, to a depth of 100 feet,~~
Magnesite on 20 acres to depth of 100 feet estimated at 8,000,000 tons.
0.59 to 3.0% SiO_2 ; Fe_2O_3 .2 to .5; MgO 45-46; Al_2O_3 .3 to 1.5;
 CaO 1.4 to 8.8; Ign loss 47-50.

World War. Magnesium. Large deposits on Pacific Coast. Brines in Texas. Westvaco the largest producer of magnesite in California closed its mines and got its MgO from the bitterns of the salt ponds on S. F. Bay.

Washington has a great tonnage of ~~low~~ impure magnesite.
California mines small tonnage at high cost.
Nevada great tonnage of great purity.

Now shipping 250 tons of magnesite and 150 tons of brucite per day.

Westvaco to gradually increase to 1,000. Basic Magnesium will erect a 1,000 ton mill to concentrate and calcine and then ship to Las Vegas to magnesium plant being built there.

Kaiser plant to turn out 11 tons Mg from 50 tons MgCO_3 per day. If successful will build 12 plants at 130 Mil \$. First plant \$11 mil. Will then use 600 tons MgCO_3 to produce 130 tons Mg per day. Expect cost to be 12¢ per # and hope to lower to 7¢/

Basic Magnesium will use electrolytic method on synthetic MgCl_2 and get salt from old deposits on Lake Mead.

Tungsten deposit lead to discovery of brucite deposit which led to discovery of magnesite. Springer sold his tungsten mine twice and neither purchased made a tungsten producer of it but the second buyer sold it a large magnesite mine.

VINCENT P. GIANELLA
300 NIXON AVENUE
RENO, NEVADA

3. Geology.

Grd intrusive into dolomite of upper Triassic age. Brucite on contact and magnesite of high purity beyond for a mile or so.

Origin of the brucite. Mg liberated by the solution of the dolomite ahead of intrusive drove out the Ca and made a pure MgCO_3 . Then either this became hydrated ~~and~~ reversal of the weathering of brucite or due to hydration of periclase. The former appears the most likely.

Many
Most of worlds large magnesite deposits are of the replacement type in dolomite although some of them are due to the alteration of basic rocks that have been altered to serpentine. Others are due to the alteration of metamorphosed dolomites that have been converted into pyroxenes of the diopside-hedenbergite series.

There are also sedimentary deposits in southeastern Nevada. Also one in White Pine range where ball-like masses of magnesite have formed in Tertiary volcanic tuffs. This is the finest of all magnesite in Nevada due to its white-burning properties because of low iron content. Brings high price for this unusual material.

In California much of the ^{*alteration*} agnesite is due to the weathering of serpentine which in turn is due to the late end-stage, hydrothermal alteration of basic rocks such as peridotite, dunite, pyroxenite, and lherzolite. Some in California is also due to hydrothermal alteration of these same rocks. Origin of magnesite, like talc, is quite diverse.

*In large clay near Bisbee, Son. Bernardino & Calif
In Tucson green magnesite similar to Calif
134,000 tons from 1932, Quebec, India and Indonesia
all from serpentine rocks
Largest at Styria, Austria repl. of dolomite 200,000 tons
Chenoweth, Washington, " " "
Quebec, Quebec, " " "*