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SULPHATE OF COPPER FOR GREECE.

CONSULAR REPORT.

g his recent telegram to the Depart-
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tras, January 6, 1902, says that in all
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n and Belgian firms. The bid of the

THE OSCEOLA, NEVADA, TUNGSTEN DEPOSITS.

BY FRED D. SMITH.

This occurrence has been noted by Mr. F. B. Weeks, of the United States Geological Survey, who visited the locality in the autumn of 1900. His notes on the "Occurrence of Tungsten Ore in Eastern Nevada," which were published in the twenty-first *Annual Report* of the Survey, were reproduced in the ENGINEERING AND MINING JOURNAL in the issue of July 6, 1901.

During December, 1901, the writer made a careful examination of this deposit and was greatly impressed by the quantity of this ore on the claims comprising the present group. It his belief that the occurrence is worthy of a more detailed description. Compared with other visible supplies of tungsten ore in the world, these mines are of a most extraordinary economic importance, as they are capable, apparently, of producing more tungsten mineral than any other mine known, and perhaps than all other mines combined.

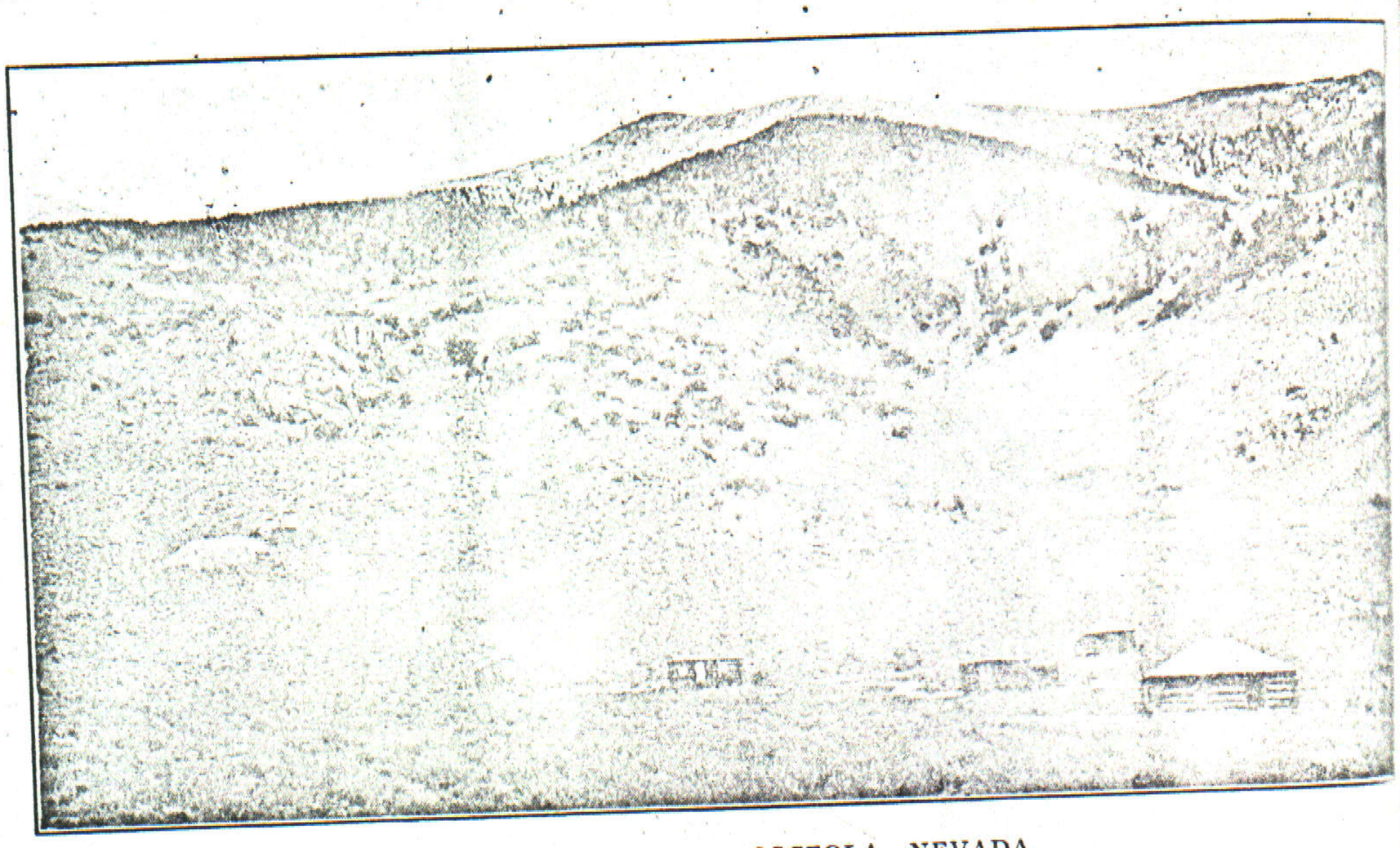
History.—The very prominent outcrops of the veins of white quartz in the brownish gray granite were noticed by the earliest prospectors, and the black mineral therein examined. The writer is informed that as early as 1885 samples of this mineral were sent to the chemist of a prominent reduction works in California, who reported same to be "specular hematite," thus confirming the prevalent misconception of the mineral.

In 1889 more observing prospectors, refusing to accept the mineral as one of iron, sent samples to Denver for analysis, with the result of learning the true character of the same, and of its value as a source of tungstic acid. It is probable that from this analysis the prevalent idea was obtained that the mineral is hübnerite and not wolframite. The writer has never made a complete analysis of it and is not aware of any such from an authoritative source.

Messrs. C. W. Gaby and W. Buntin located on the more prominent veins in 1899 and have since made several small shipments of hand cobbed ore which

Geology.—The veins are in the foot hills and lo
est slope of the Snake Mountains. (See Fig. 1
For a distance of several thousand feet up the sid
of the mountain and for an elevation of about 1,50
feet the formation is granite, which is overlain b
Cambrian quartzite. The latter rock forms the ma
ridge of the mountains to the top of Mount Wheele
or of Davis Peak, which is directly above the de
posits in question. The veins, of which there a
five prominent ones, all occur in the granite an
plainly cut across the bedding of the granite, whic
is very indistinctly marked. They have been trace
to the contact of the two rocks, though none ha
yet been found in the quartzite. The general stri
of the veins is northeast-southwest and the dip
the northwest. Only one is developed, and as th
directions are determined from the croppings on
there is necessarily much uncertainty regarding th
parallel character, or whether some of the veins w
ultimately run together.

In many cases the croppings are very prominen
for instance, on the hübnerite, where the vein ca
be traced in one continuous line for a distance of
feet. Figure 2 shows the vein running from



TUNGSTEN MINE, OSCEOLA, NEVADA.

dump of the tunnel up the mountain side
has covered the veins in many places, but the
discernible for a total distance of 1,800 feet,
as one vein or as parts of several, up the m
side which has a general slope of about 18°.

The hübnerite vein, as shown in the tunnel
strike of N. 70° E. and a dip of 65° N. W. Th
are well defined and part easily from the ve
separated on the foot by a layer of clay. Th
varies from 18 to 36 inches and averages
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On the surface the vein sho greater
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ULAR REPORT.

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Messrs. C. W. Gaby and W. Buntin located on the more prominent veins in 1899 and have since made several small shipments of hand cobbed ore which was taken from the outcroppings of the richest parts of the veins. In the summer of 1900 a small hand-made jig and canvas table were erected and operated by horse power. Later a gasoline engine was used for motive power, but the equipment was not adapted to the concentration of the mineral either from the economic or the metallurgical standpoint.

A shipment of about 10 tons of concentrates, which carried from 65 to 70 per cent WO_3, was made in 1900. The owners then sold their claims to Mr. J. H. Marriott, of Osceola, Nev., who had previously located the surrounding claims which showed any veins of the mineral. The present owner drove a tunnel for a distance of 208 feet on one of the stronger veins, the workings of which can be seen in Fig. 2. The ore taken from this drift was left on the dump and shows plainly the character of the vein filling.

of the veins is northeast-southwest and the dip to the northwest. Only one is developed, and as the directions are determined from the croppings only, there is necessarily much uncertainty regarding the parallel character, or whether some of the veins will ultimately run together.

In many cases the croppings are very prominent, for instance, on the hübnerite, where the vein can be traced in one continuous line for a distance of 600 feet. Figure 2 shows the vein running from the dump of the tunnel up the mountain side. Talus has covered the veins in many places, but they are discernible for a total distance of 1,800 feet, either as one vein or as parts of several, up the mountain side which has a general slope of about 18°.

TUNGSTEN MINE, OSCEOLA, NEVADA.

The hübnerite vein, as shown in the tunnel, has a strike of N. 70° E. and a dip of 65° N. W. The walls are well defined and part easily from the vein being separated on the foot by a layer of clay. The width varies from 18 to 36 inches and averages 26 inches throughout the whole length of the tunnel.

On the surface the vein shows greater width in places, and in some it has narrowed to 6 inches. Large boulders of quartz not properly in place, which from their proximity to the vein show their connection with it, are scattered along the slopes below the vein.

Character of the Ore.—The hübnerite occurs in the white quartz in various sized crystals, many of which are 3 inches long and plainly show the crystalline character. Massive specimens when broken show cleavage planes from 2 to 4 inches long and 1 to 3 inches wide. However, much of the mineral is in fine grains and in irregular bodies. The quartz is found entirely enclosing the hübnerite in some cases while the reverse is also true in that some specimens of apparently solid mineral will be found to enclose the quartz. This plainly shows that the two minerals were deposited simultaneously. In some cases a laminated appearance of the quartz is fund with the hübnerite concentrated between the laminæ of quartz, giving a banded appearance to the mineral. This is more prominent where the vein pinches to a width of 6 to 12 inches.

The quartz is very solid with practically no evi-

dences of weathering such as shown by pores or a honeycomb character. No oxidation products as iron oxides, etc., are found. In some few instances a yellowish efflorescence suggesting tungstite, WO_3, was observed though unidentified.

In one locality a considerable amount of scheelite was found mixed with the hübnerite. Its color varies from a waxy grayish white to a pale yellow and is often overlooked or mistaken for the quartz.

As far as studied, it appears that the mineralization of the vein has taken place across its whole width, though it often occurs in larger quantities on one wall than on the other. This concentration on the walls was found to change from one side of the vein to the other in short distances. It was also found that a concentration of the mineralization into so-called shoots had taken place. These shoots were from 15 to 25 feet in length and were separated by less mineralized portions of the vein of about the same length. At the same time some mineral was found in all of the vein.

These shoots are very prominent on the surface, as each shows an abundance of the hübnerite in massive form owing to the high contrast in the colors of the hübnerite and the gangue. At a depth of 80 feet at the face of the tunnel, it is reported that the mineral was found in as good a proportion as the surface indications would suggest.

Accessory Minerals.—As far as examined the ore is remarkably free from other minerals. Pyrite was found in a few places in small bunches, but the absence of iron stains would indicate a small content of pyrite. None was seen on the croppings. Fluorite in very small quantities was found on the dump from the tunnel workings, though to what extent it occurred in the vein could not be learned. These two minerals, besides the hübnerite, scheelite and quartz, were the only ones found, unless more careful examination discloses the presence of wolframite mixed with the hübnerite.

Practically all of the ore shipped has been either hand sorted and cobbed or concentrated by the crude methods outlined above. These ores carried an average of 68 per cent tungstic acid. One shipment of 2,000 pounds gave 600 pounds of 65 per cent concentrates. The ore was closely cobbed before shipment. Hand concentrated samples have assayed as high as 67½ per cent WO_3.

From the ore as exposed in the croppings and in the tunnel workings it is the opinion of the writer that the whole vein matter, if carefully concentrated so as to save both the hübnerite and the scheelite, would produce 10 per cent of mineral carrying 70 per cent, WO_3.

A small sample of the pyrite found on the dump was assayed for gold and silver and found to carry 2½ ounces silver and a trace of gold. Samples of pure hübnerite were found to carry 2 ounces silver and likewise a trace of gold.

The mine appears to be singularly favored, for Nevada mines, in that it is very accessible, being practically in the valley, at the foot of the mountain, and in close proximity to water both for milling purposes and for power. The mountain sides above are still covered with wood for fuel and some of this is large enough for mill and mine timbers. The nearest railroad point is Frisco, Utah, on the Oregon Short Line, a distance of 85 miles, over

COAL AND COKE SHIPMENTS.

Heavy snowstorms have interfered with transportation of fuel from producing centers, causing much inconvenience to consumers. In fact, the shortage of fuel in certain sections of the iron and steel industry has resulted in the banking of a number of blast furnaces. This shortage is, of course, only temporary, but it is annoying at a time when demand for iron and steel is brisk. On the other hand, prices for fuel have strengthened and for certain deliveries sellers are asking a heavy premium. Just at present export trade is necessarily neglected, although at ruling low ocean freights this would seem an opportune time to enter foreign markets.

Anthracite.—The demand is good, owing to cold weather, but shipments from collieries are limited by the small car supply. In January shipments were approximately 4,538,138 tons, which compares with 5,183,392 tons in January, 1901, the record breaking month. The Pennsylvania Railroad moved from January 1 to February 15, a total of 572,598 short tons, against 631,443 tons in the corresponding period last year. This decrease of 58,845 tons was more than made up by the heavier shipments of bituminous coal and coke for the same period. Receipts of anthracite coal at ports on the Great Lakes in 1901 aggregated 3,371,254 tons, or 998,659 tons more than 1900. The increase was principally in the tonnage received at Milwaukee and Chicago. The shipments from Lake ports in 1901 were nearly as large as the receipts, amounting to 3,310,323 tons, against 2,073,500 tons in 1900; showing an increase of 1,236,823 tons, or over 37 per cent. This improvement was chiefly in the Buffalo shipments, which were 2,594,159 tons in 1901, as against 1,422,663 tons in 1900. Lake freight rates from Buffalo in 1901 averaged fractionally above those of 1900, but are much less than 1899, when tonnage moved at fancy rates.

Bituminous.—Collieries report a better supply of the large 50-ton steel hopper cars, while the wooden cars, which are in most demand, move slowly. The shipments originating on the Pennsylvania Railroad from January 1 to February 15 aggregated 2,885,082 short tons, or 106,888 tons more than for the corresponding period last year. During January the Beech Creek District in Pennsylvania sent forward 494,049 short tons. The Huntingdon & Broad Top Mountain Railroad moved from January 1 to February 22 a total of 290,255 tons, which is a decrease of 67,768 tons from last year, due to the smaller shipments from the Cumberland Region. Broad Top showed an increase of 40,732 tons this year. In the full year 1901 the Broad Top shipments were 642,598 tons, while those of Cumberland were 1,749,988 tons, making a total of 2,392,586 tons, showing an increase of 306,522 tons, or 12.8 per cent, as compared with 1900. In the 11 months ending November 30, 1901, the Norfolk & Western Railroad shipped 5,379,036 tons, of which 2,315,129 tons, or 43 per cent, went to tidewater. In the same period in 1900 there were shipped 5,278,304 tons, of which 2,239,385 tons, or proportionately the same percentage as in 1901, went to tidewater. The total increase in 1901 over 1900 was 100,732 tons. Shipments over the Chesapeake & Ohio Railroad from July to November, 1901, the first 5 months of the company's year,

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