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STEPOVITCH — TUNGSTEN PROPERTY

MI-058-01A

History & Workings.

Tungsten bearing minerals were first discovered in the placer concentrates of Fairbanks and Little Eldorado Creeks as early as 1909.

(1) During the summer of 1915 the bedrock source of some of these tungsten minerals was discovered, and tungsten lodes became another of the mineral resources of the Fairbanks district. Prospecting has centered chiefly at two localities, one on the ridge between Fish and Smallwood Creeks, and the other on the ridge at the heads of First Chance, Steele and Engineer Creeks. Two workable scheelite lodes have been opened at the former locality, and a number of promising occurances are being prospected at the later.

(2) The Tungsten claim owned by George Evans is on the divide between Fish and Smallwood Creeks on a prominent dome at the heads of Melba and Monty Cristo Creeks. Scheelite was discovered on this claim in the summer of 1915, and mining was begun in the fall of that year and continued into the summer of 1916. In August, 1916 an 18 horsepower gasoline engine and an air compressor had been ordered, and the owner was prepared to put in a track, install a skip, and begin operations on a larger scale.

The development work up to August consisted of an 80 foot incline at an angle of about 35°; a 35 feet drift to the east about 50 feet down the incline; and another drift some distance to the east at the bottom of the incline. It was from this lower drift that the latest shipment of ore was mined.

The country rock at the Tungsten, as well as at the adjoining Scheelite claim, consists largely of crystalline limestone, extensively silicated at certain horizons. Such silicated rocks have been described by Prindle under the designation "silicated limestone". His conclusion regarding the origin of these rocks is as follows:- "The most probable tentative explanation is that these rocks were impure calcareos sedimentary rocks containing basic or interbedded tuffaceous material, and that they were metamorphosed while they were deeply buried."

The silicated portions of the country rock at the Tungsten and Scheelite claims contains calcite, pyroxene, hornblende and quartz. Thus there are pyroxene-quartz, hornblende quartz and pyroxene - calcite rocks as well as rocks of intermediate types. One specimen of a pyroxene calcite rocks shows the two minerals in poikilitic intergrowth. Hornblende shist and mica shist also occur in the near vicinity. It is believed that the recrystallization of the country rock to its present condition was quite independent of any effect of the ore bearing solutions - that is, the alteration of the country rock appears to be due to the regional and not to contact metamorphism.

The scheelite occurs as disseminated deposits in the mineralized zones or as ore shoots in the country rock. In the drift that starts 50 feet from the surface several tons of ore were removed from a small ore shoot about 18 inches high and 18 inches across. The strike of this shoot was N80E and dips 35 NW. At the bottom of the shaft, another ore shoot, nearly horizontal, was opened. This body of ore 10 feet from the shaft, nearly horizontal was opened. This body of ore 10 feet from the shaft is 7 feet wide and eight feet high, but at the east end of the drift in August it is 4 foot wide and 5 feet high, apparently trending about east. The cleavage of the country rock dips 35' N the same direction and pitch as that of the shaft. The first shipment of ore from the mine was taken from the inclined shaft, and it appears therefore that the ore bearing solutions in that locality follow the rock cleavage. Ore deposition in general has probably been guided by the facility of circulation afforded by the country rock.

The rock that contains the scheelite is of particular interest, on account of the bearing which its character has on the genesis of the deposit. One specimen of ore examined under the microscope is composed of quartz, augite scheelite apatite and chloritized biotite. A small amount of uralite hornblende also is present, derived probably from the altered pyroxene. The scheelite occurs as euhedral crystals and appears to be secondary with respect to the other rock minerals.

Another specimen taken from the shaft by Mr. Johnson, a former part owner of the Tungsten Claim, is apparently a tungsten-bearing pegmatite. The rock forming minerals are quartz, oligoclase, scheelite, apatite, titanite, and a little biotite and hornblende, both chloritized. A small amount of sericite, apparently derived from the feldspar is also present. The scheelite has developed as enhedral crystals, which contain anhedral inclusions of quartz and oligoclase, together with euhedral inclusions of apatite. The exact spot in the shaft from which the specimen was taken was not discovered by the writer, but it assuredly an in-tegral part of the deposit.

The Tungsten and the Scheelite claims are about a third of a mile from a large body of porphyritic granite to the south, and about two-thirds of a mile from a smaller body of similar intrusive rock to the north. Without much doubt these bodies of granite ore are connected beneath the surface, and therefore underlie this deposit of scheelite at no great depth. These data, taken in connection with the presence of the scheelite bearing-pegmatite above described, show the intimate genetic connection between the intrusive rock and the tungsten ore. This deposit of scheelite then, particularly near the surface, where it is at present being worked, is a disseminated deposit, the tungsten-bearing solutions having been derived from a near-by granite magma. Mining operations closer to the igneous rocks may show the presence of difinite contact-metamorphic deposits.

Fifty tons of scheelite ore was mined and shipped in the form of scheelite concentrated from the Tungsten claim in 1915, and 160 tons was mined, concentrated and shipped in 1916. The ore was hauled to the Heilig custom mill of Fairbanks Creek for concentration, and afterward shipped by parcel post.

(3) Quartz mining showed a slight increase in 1917, which in part was due to the interest in Tungsten lodes. Two tungsten mines were in the course of development. At one of these mines one unit of a 75 ton mill was in operation, and in the summer of 1917 was turning out several hundred pounds of scheelite a day. On the other property a similar mill was in the course of construction during the summer. Development was in progress at both properties. The surface showings indicate the possible presence of large tungsten bearing deposits.

(4) The Alaska Tungsten Mines Co. has property on Yellow Pup Creek, one of the tributaries of Fish Creek and on the knob between the heads of Gilmore, Smallwood and Fish Creeks. The principal work has been on the Tungsten claim at an elevation of 3473 feet. The property is reached by a first class wagon road from Gilmore on Pedro Creek by way of Gilmore Creek. The lode strikes N70E parallel to the schistosity of the country rock and dips from 30 to 40 NW. The footwall is well defined and follows approximately the bedding planes of the greenstone and the quartzite schists. The vein ranges in thickness from 3 to 12 feet and more, but the richest ore is confined to lenses from 2 to 5 feet thick. There is no definite hanging wall to the lode, but back of each is more ore. These are evidently structural planes, either bedding planes or less permeable zones in the original rock along which replacement has taken place. Thin stringers of scheelite-bearing quartz of later origin than the replaced rock follow the bedding planes and cut across them.

The mine is being developed by an inclined shaft driven along the vein. In September 1917 this shaft had been extended for 160 feet and dips at an angle of 40 to 18. In places the shaft widens out to stopes and chambers, and the lower part has been opened to a width of 40 feet.

The mill and camp of the Alaska Tungsten Mines Co. is on Yellow Pup at an elevation of 1800 feet. One unit of a Faunt concentration mill was installed during the summer of 1917 and in September was turning out 500 pounds of scheelite concentrates a day.

Up to the Armistice in 1918 the demand for Tungsten was good. However, when the market slowed the small producers were forced to close. Such seems to be the case with the Tungsten property for hardly any work has been done since. Several large options on ajadent properties were dropped by the Alaska Tungsten Mines Co. just after the Armistice. This indicates the general condition.

Present Workings

The shafts, of which there are two, are probably in poor condition although the drift on the Slav claim is in good condition and accessable. Mr. Heath stated that the shaft marked "No. 2" on the Scheelite "No. 2" was sunk on high grade ore. Mr. Heath said that enough ore might be extracted from this shaft to pay for opening up. The specimens were taken from Shaft No 2. Shaft No. 1 on the Slav claim produced only marginal ore. The drift which was driven from the north some 300 feet, probably had as an objective the ore under the shafts. This seems to have been driven later than 1918 as the timber is still in good condition. No signs of the Tungsten stringers were observed in the drift and apparently results were discouraging as work was not continued. It would take further examination to prove this. Near the portal of the drift is the compressor or boiler house which contains an old steam compressor of approximately 170 cubic feet per minute capacity. This might be usable after repairing.

Mill

The mill which is in the Scheelite No. 3 claim is approximately 4000' away

from and almost 1000 feet below the portal. The mill, shafts and portal were formerly connected by a wagon road which is now thickly overgrown with brush. This mill, it is claimed, crushed some thirty tons per day. If this figure were halved it would be closer to fact.

The unit consists of a mill building, Blake Crusher crushing to 1/2 inch, rolls crushing to 10 mesh, bucket elevator, jigs and concentrating table. The equipment is in very poor mechanical condition, and as there is no power plant, could not be used.

The metallurgy of scheelite is complex and even with efficient grinding and separation, 80 % extraction is seldom reached. The extraction of the Stepovich plant would be under 60 %. This is caused by insufficient grinding to free all mineral and loosing of all very fine scheelite. It may be added that in this plant about half the time was spent in repairing and replacing. This is understandable as rolls are efficient only in a very narrow range of crushing. Also if wear becomes excessive the ore would pass much coarser than the 10 mesh set for and extraction would fall off.

If the lease were taken and ore was found, Mr. Heath's mill which is about a mile and a half away could be used. It could be made available for custom work and its extraction raised by a few simple additions.

REFERENCES

(1) Bulletin 658 - 1916 - Mertie

(2) " 662 - 1916 - "

(3) " 692 - 1917 - Chapin

(4) " 692 - 1917 - "