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Determination of Minerals in Ore Specimens from the Morton Woolsey Mine

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Geology 9

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Sc. '40

SECTIONS

Morton Woolsey

1. Pyrite, Chalcopyrite, Quartz.
2. Pyrite, Scheelite, Quartz,
3. Pyrite, Stannite, Chalcopyrite, Tetrahedrite, Quartz.
4. Pyrite, Stannite, Tetrahedrite, Scheelite, Chalcopyrite, Sphalerite, Carbonate.
5. Pyrite, Scheelite, Quartz.
6. Pyrite, Stannite, Tetrahedrite, Sphalerite, Carbonate, Quartz.
7. Scheelite, Pyrite, Quartz.

Snowflake

8. Stannite, Tetrahedrite, Pyrite, Sphalerite, Carbonate.

Determination of Minerals in Ore Specimens from the Morton Woolsey Mine

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The object of this report on the Morton Woolsey is to determine the minerals and to study their occurrences as found in the specimens of ore examined. The study of the ore was done by making polished sections and etching them. The minerals were later confirmed by microchemical methods.

Much valuable information was obtained from the Report, "Tin-Silver Veins at Snowflake Mine, B.C." , Economic Geology, Vol. 26, No. 2, April, 1931, by Dr. H. C. Gunning. Although this report does not deal with the Morton Woolsey Mine, the information contained in it applies in most cases to it, as the veins on the Snowflake property extend into the Morton Woolsey property.

The Annual Reports of the Minister of Mines for British Columbia also contains information on this property.

Location

This property is situated on the East Fork of Silver Creek which flows into the Illecillewatt River at a point about 2 miles west of Albert Canyon Station, on the main line of the Canadian Pacific Railway. It is 18 miles northeast of Revelstoke.

The camp is 2,000 feet above Albert Canyon or at an elevation of 4,200 above sea level.

General Geology

The rocks of this area consist of carbonaceous and quartzite argillite and a few impure calcareous beds. They have a strike northwest and the dip varies from 35° to 65° northeast. They form part of a thick series of argillites, quartzites, mica, and chlorite schists and limestone which is underlain conformably by quartzite, schist, and interbedded greenstone of obscure origin.

"Between Silver Creek and Revelstoke, these underlying rocks are converted to paragneiss and contain many lit-par-lit injections and dykes of orthogneiss, granite, and pegmatites. Many granite stocks cut the Upper Series of sediments. These intrusions are correlated with Mesozoic intrusions, Late Jurassic or Early Cretaceous, and it is believed that their magma or magmas supplied the mineralizing solutions which formed the ore deposits of the district. The sediments that they intrude are Pre-Cambrian. They are correlated with the Windemere group of Late Pre-Cambrian rocks of the adjoining Lardeau map-area."[1]

The Snowflake and Morton Woolsey Veins

The veins may be classified as the bedded fissure type, as they conform in strike and dip with the beddings of the sediments. The majority of the veins located on the Snowflake property extend into the Morton Woolsey ground. The strata are not badly folded or faulted, and the veins show

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1. Ec. Geol. Vol. 26, 1931. H. C. Gunning

persistency in outcrop. The veins are composed of massive white quartz which were later fractured and thus formed channels for the mineral bearing solutions. There is also some ore found in the fractures of the slate. Rough banding occurs in some of the veins, which is due to inclusions of argillite. This can be seen in some of the prepared sections. The principal ore-mineral in the mine is argentiferous galena which occurs replacing the quartz in streaks and bunches. The samples from which the sections were made are from a part of vein where there is very little galena, and hence no galena was found in them. The minerals associated with the argentiferous galena are sphalerite and pyrite.

Mineralogy

Megascopically.- A megascopic examination of the ore shows quartz and pyrite to be the dominant minerals. Scheelite and stannite were also fairly abundant with minor amounts of chalcopyrite.

Microscopically.- Under the microscope the minerals seen were quartz, scheelite, pyrite, chalcopyrite, tetrahedrite, stannite, sphalerite, and a carbonate.

Quartz

In the sections examined, the quartz seems to have been deposited generally throughout the whole mineral deposition period. There was fracturing of the earlier formed quartz, which allowed the other minerals to be deposited.

Pyrite

Pyrite is the most abundant sulphide mineral present. It is commonly coarsely crystalline and is contained in the quartz and wall-rock. Pyrite was evidently the first sulphide to crystallize. It is largely veined and replaced by the later sulphides where they occur with it.

Stannite

This mineral gave considerable trouble in its identification. Finally a section of known stannite from the Snowflake was made and compared with that from the Morton Woolsey. They showed similarity in their reactions, being negative to all reagents except HNO_3, which gives a brownish tarnish. The presence of stannite was finally confirmed by micro-chemical tests. Copper, iron, sulphur, and tin were found. It was found that the rubidium chloride test for tin proved much more satisfactory than the cesium chloride test.

The stannite crystallized soon after the quartz and pyrite. It is cut by tetrahedrite and contains small particles of chalcopyrite.

The deposits of stannite on the Snowflake and Morton Woolsey properties are believed to be unique, in that stannite is found without any associated cassiterite, which latter mineral is the recognized ore of tin. In the known tin-deposits of the world, stannite, a comparatively rare mineral, has not yet been known to occur in large quantities, and consequently, as an ore of tin, it has not been considered seriously from the commercial point of view.

It is hoped that, with greater depth in the Morton Woolsey mine, stannite will give place to cassiterite and the mine will develop into a tin producer.

Tetrahedrite

This mineral is more closely related to stannite than it is to pyrite, as very little is found in contact with pyrite. Chalcopyrite is also contained in the tetrahedrite.

Scheelite

In some of the sections, scheelite makes up more than 50 per cent. of the area. It is a creamy to light brown colour.

Sphalerite

The sphalerite is also a minor constituent in the specimens examined. It was found bordering the quartz as shown in the illustration of Section 4.

Carbonate

Small amounts of carbonate were detected in close relation with the sphalerite in the areas surrounding the quarts.

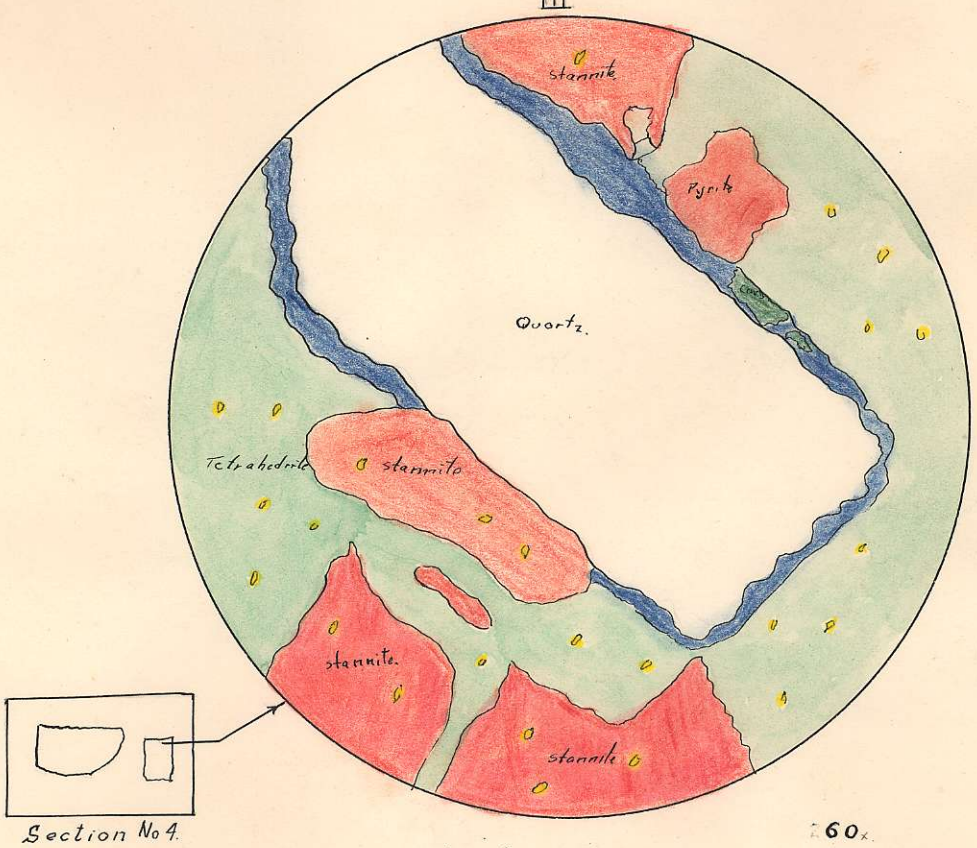
Assays were made on the ore, and traces of gold, but no silver, were found. From these facts, it is believed that the silver is not contained in the pure stannite but is almost entirely with the galena and ruby silver which are found in other parts of the mine.

Paragenesis

The following events, from evidence in the sections examined, took place in the formation of this ore depost.

1. Fracturing and fissuring of the carbonaceous and quartzite argillites.
2. Deposition of the scheelite and fracturing.
3. Deposition of quartz which was later fractured.
4. Deposition of pyrite.
5. Deposition of stannite which was later fractured and intruded by the tetrahedrite.
6. Chalcopyrite appears to have crystallized out more or less continuously, as it is found as a few specks in the pyrite, stannite, and tetrahedrite.

III

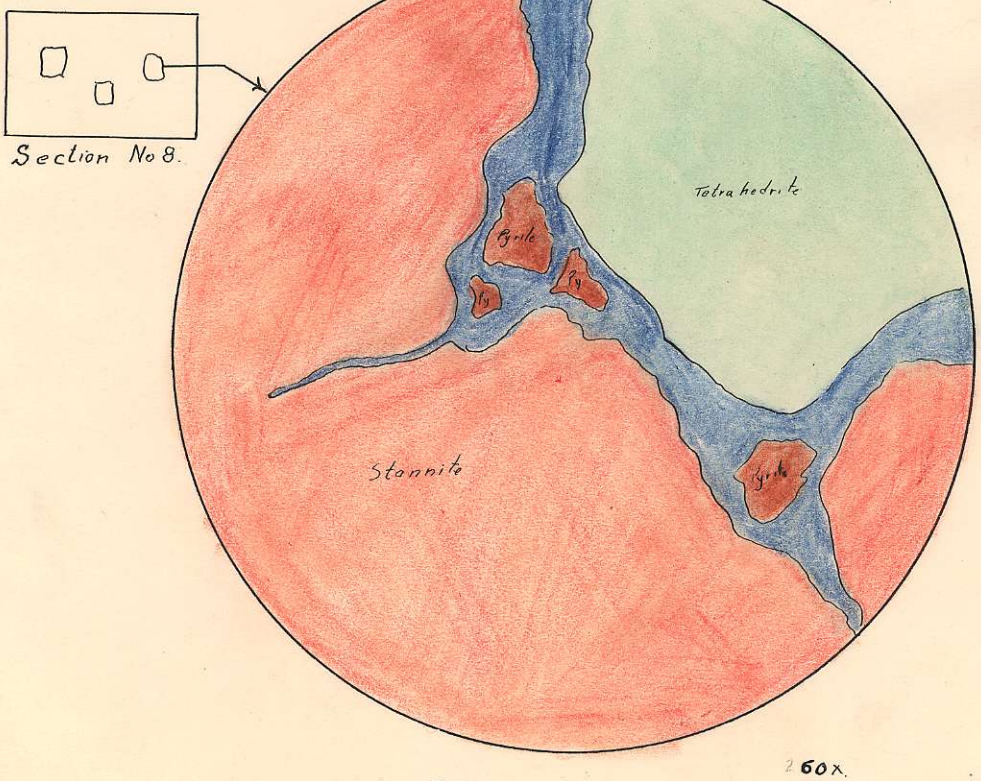


Section No 4.

60x.

Morton Woolsey. Ore.

IV

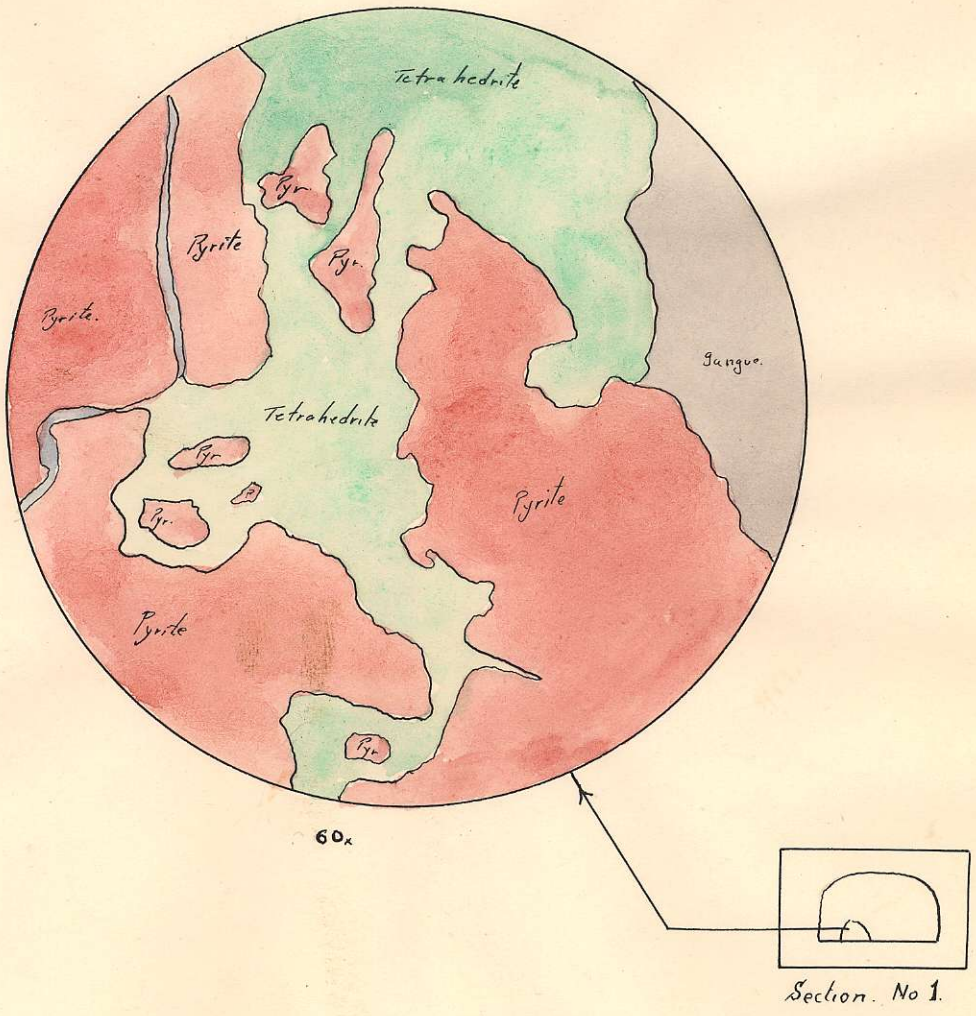


Section No 8.

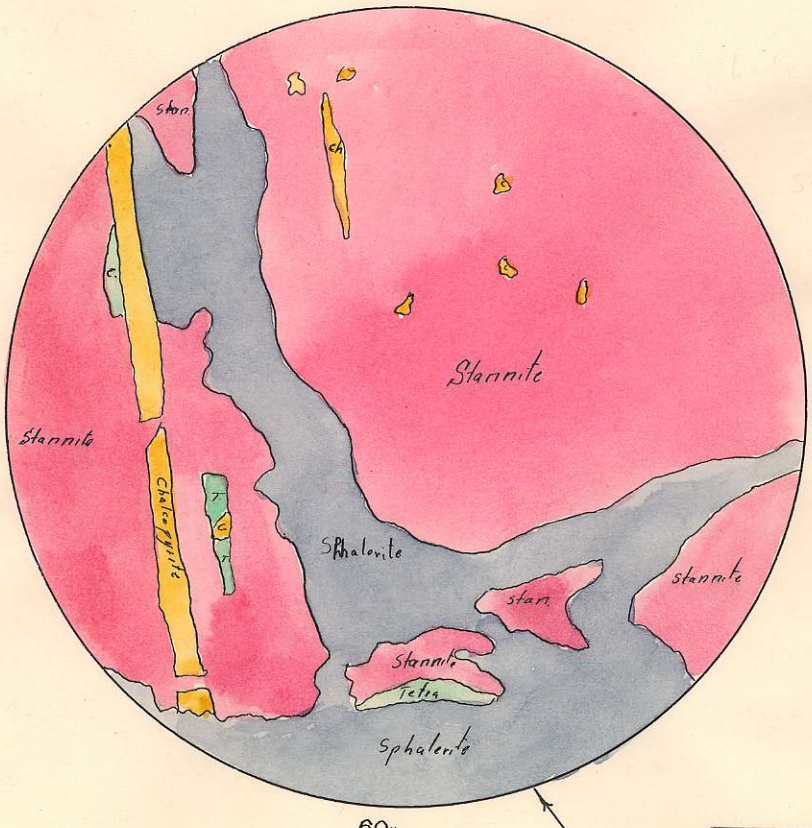
260x.

Snow Flake Ore.

I


Tetrahedrite
Pyr.
Pyrite
Pyr.
Pyrite.
Gangue.
Tetrahedrite
Pyr.
Pyr.
Pyrite
Pyrite
Pyr.
60x
Section. No 1.

II



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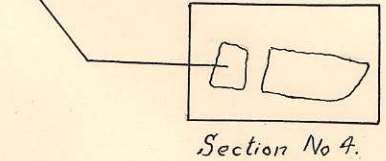

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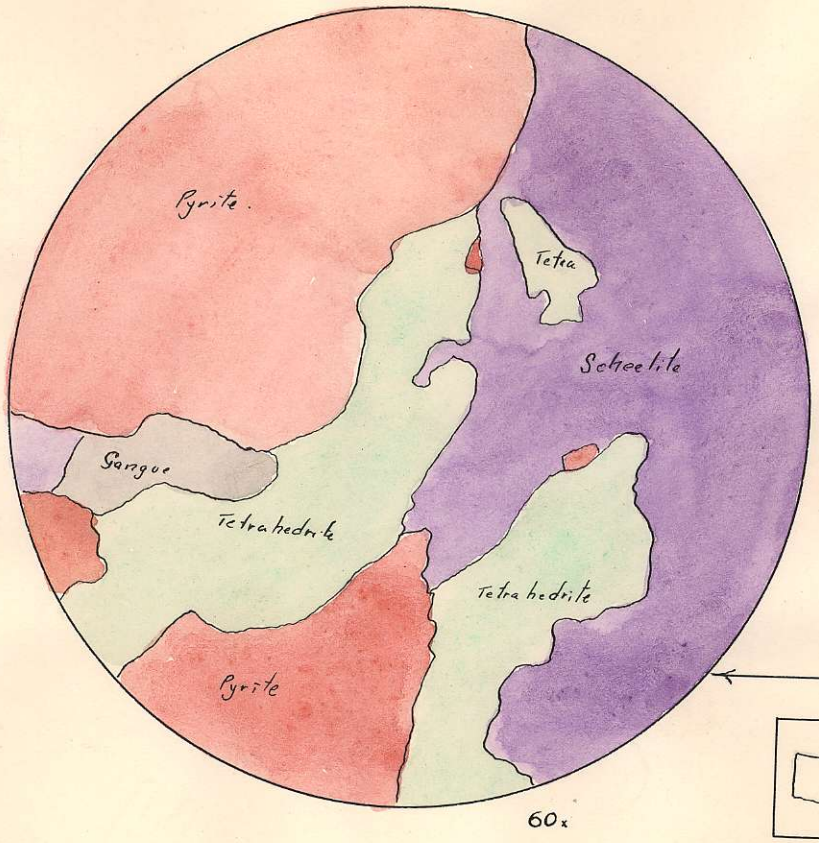
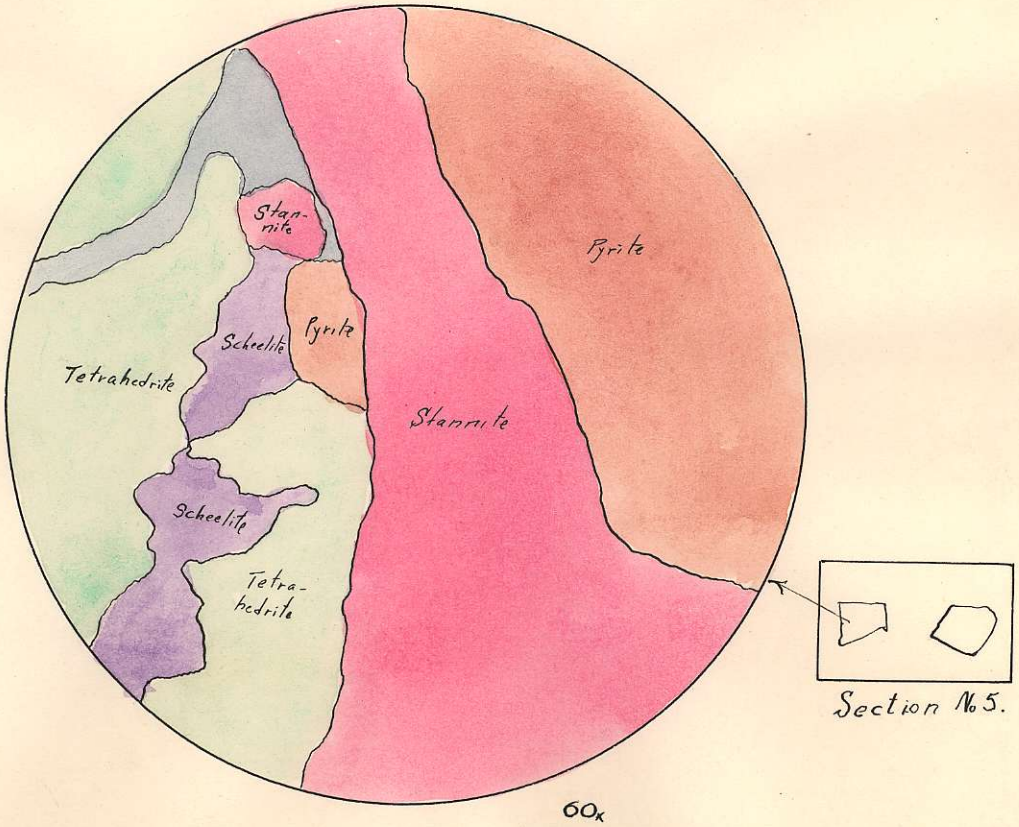
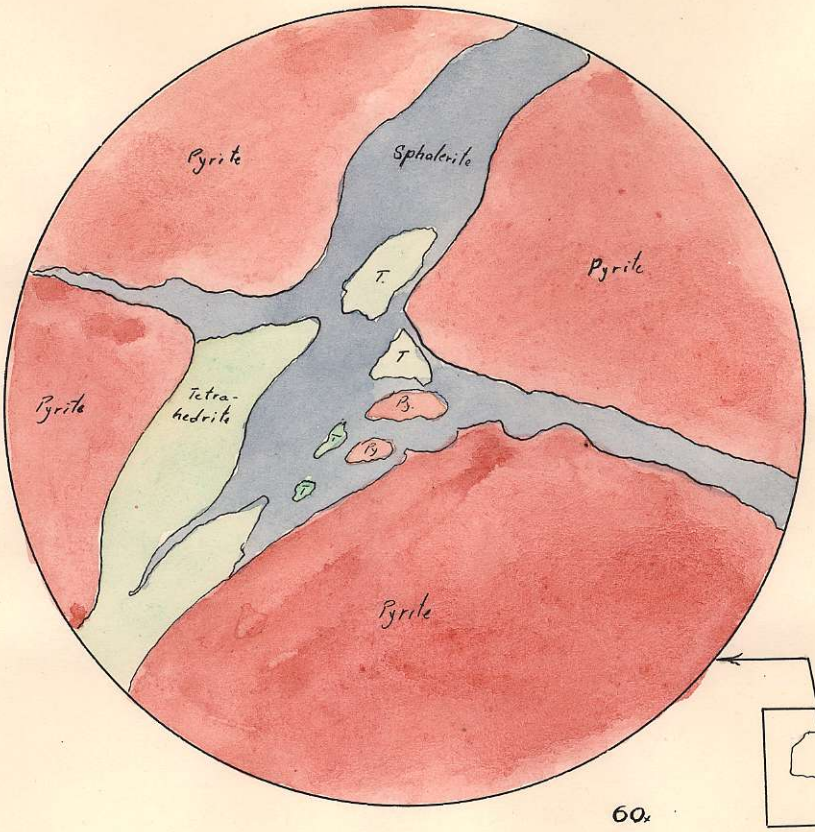
V

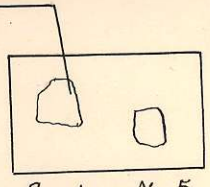

Pyrite.
Tetra
Scheelite
Gangue
Tetrahedrite
Tetrahedrite
Pyrite
60x
Section No 4.

VI


Stan-
nite
Pyrite
Scheelite
Pyrite
Tetrahedrite
Stannite
Scheelite
Tetra-
hedrite
60x
Section No 5.

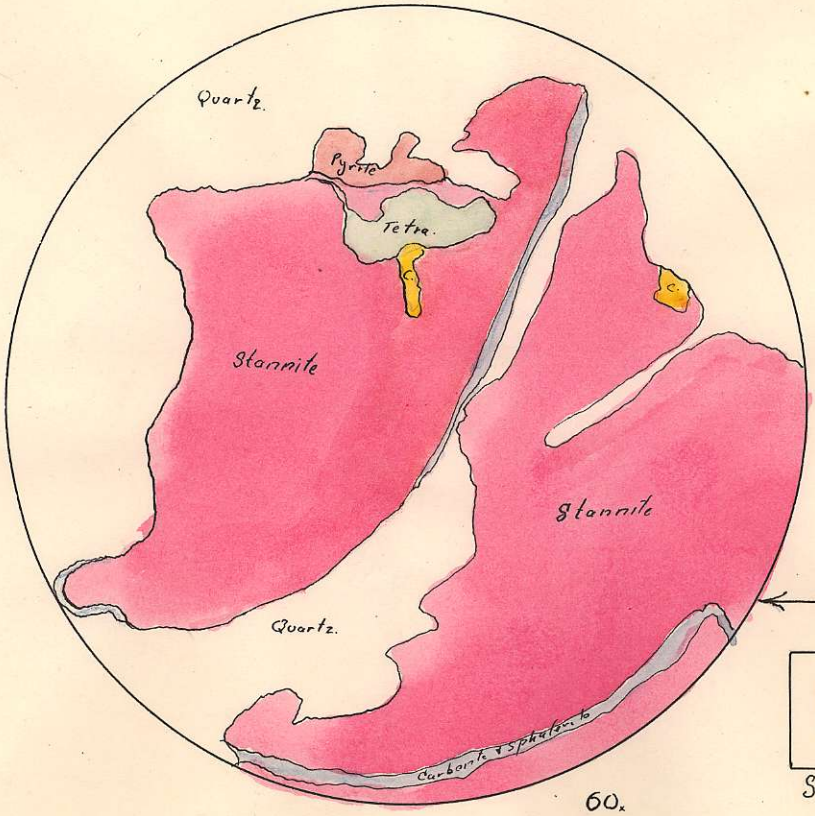
VII

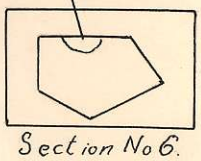




Section No 5.

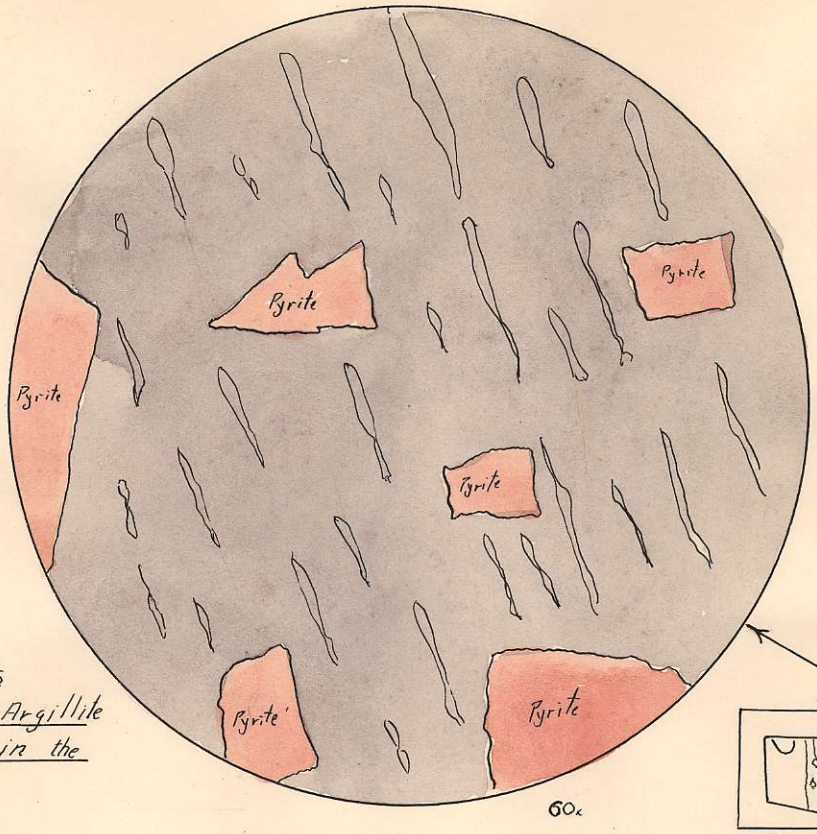
VIII



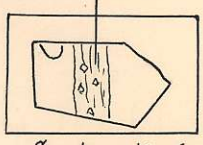


Section No 6.

IX



Banding as seen in the Argillite inclusion in the ore



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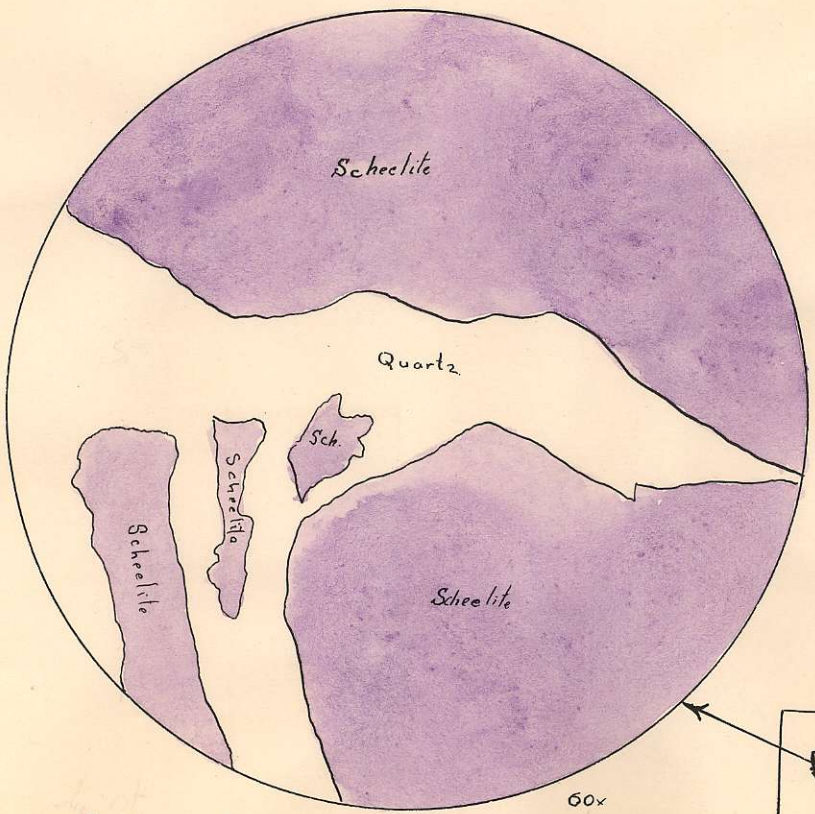
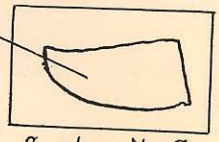
X



Section showing scheelite cut by quartz



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