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DETERMINATION OF MINERALS
-YANKEE GIRL & WESKO-
(GEOLOGY 9)

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METALLURGY '38

DETERMINATION OF MINERALS OF YANKEE GIRL & WESKO ORES

(Geology 9.)

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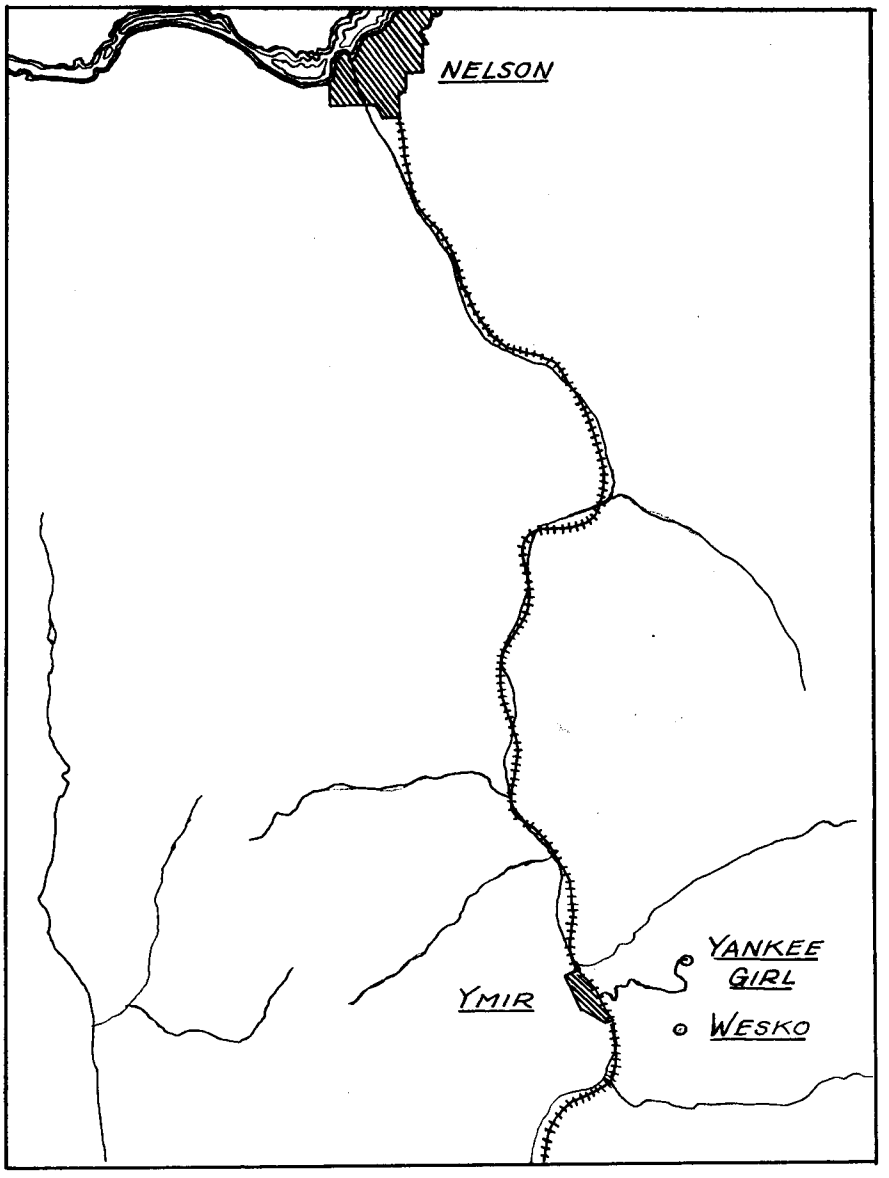

NELSON
YANKEE GIRL
YMIR
WESKO

YANKEE GIRL

The Yankee Girl mine is about 2 miles from Ymir on the northern slope of Bear Creek valley. A disused road branching from the road up Bear Creek connects with the lower or working tunnels of the mine. The mill is immediately across the Salmo River from Ymir and is connected with the mine by an aerial tramway. The property consists of the Yankee Girl, Canadian Girl, Lakeview, Black Diamond, Yukon fraction, and Klondyke No.1 fraction claims.

Between 1899 when they were staked, and 1932 when the claims were organized into the present company, Ymir Yankee Girl Gold Mines Limited, the mine has been developed and operated by various companies. Shipments of ore were periodically made until 1934 when these were suspended, to break ore for the mill erected in that year.

Geology of the Deposits

The Yankee Girl deposits occur in the contact zone of a mass of the Nelson granodiorite, which trends northeasterly across the camp. At the mine a larger number of tongues of this rock penetrate the Pend D'Oreille schists and the main body of granitic rock is probably cut by the extension of the Lakeview vein which lies northeast of the Yankee Girl vein proper. Owing to the heavy drift cover in critical areas difficulty was experienced in mapping the content of the granitic bodies at the surface, as in places where only outcrops of the granitic rock are seen, it is thought that bands of schists are also present but concealed by drift. This is ind-

icated too in the mine workings. The granitic tongues are very irregular and so far it has proved impossible to match up their exposures on the opposite sides of the vein fissure on any of the levels and thereby determine the relative direction and amount of movement along the fissures. Striations on the vein walls pitch at an angle of about 65 degrees to the west and downwards. The vein fault is of the normal type but the amount of movement is unknown.

The main Yankee Girl vein is in a fissure generally 4 to 6 feet wide striking 60 to 70 degrees east and dipping 55 to 70 degrees southeast with an average dip close to 65 degrees. It averages about 4 1/2 feet wide; has a maximum width of about 30 feet but in productive sections does not exceed 12 feet.

Principal values are in gold, the ore averaging 0.42 ounces per ton. Appreciable quantities of silver lead and zinc are also present. The distribution of values is erratic; some sections are very high but values may disappear as rapidly as the enter. In most cases the ore forms fairly well--defined shoots raking to the east.(1)

PARAGENESIS

Chemical and physical test on polished sections of picked mine samples show that the minerals present are:

1.Pyrite

2.Quartz

3.Sphalerite

4.Galena

The order of deposition of these minerals during

(1) G.S.C. Memoir No. 191 page 27-29

the vein formation, as determined from the samples, indicate that they were probably laid down in the above order.

Minerals

1. Pyrite

Microscope analysis of the specimen samples show that the pyrite has been fractured and evidently carried along by subsequent mineralizations. Cubes of this mineral appear as islands in the masses of quartz, sphalerite and galena, and, further, quartz also occurs as the material filling the cracks in the fractured pyrite. From this evidence, it has been concluded that pyrite was the first mineral deposited during vein formation. In the lower levels the pyrite is very fine grained.

2. Quartz

Quartz and pyrite form the majority of the veining material, with the former mineral being present in somewhat larger proportions than the latter. It appears as the white translucent variety throughout the mass of the minerals. This mineral appears as vein material in pyrite and galena and sphalerite show encroachments into it along their boundaries; as in figures 4 and 5.

3. Sphalerite

In the sequence of deposition, this mineral comes third--after pyrite and quartz, and before galena. Evidence of this is shown along its contacts with quartz and galena. Sphalerite can be seen to have flowed into the cracks of the quartz--galena into the cracks of sphalerite.

4. Galena

Deposition of galena appears to be last. It often occurs along the contact zone between sphalerite and quartz. Sometimes it appears as small veinlets in the pyrite,(fig. 6 & 7) quartz and sphalerite and in a few places blebs of it can be seen in the sphalerite.

WESKO

This property, on the eastern side of Salmo Valley south of Bear Creek consists of sixteen claims, which are being developed by the Wesko Exploration and Development Company Limited. A road branching from the Yankee Girl mine road, connects the mine with Ymir, four miles distant.

The claims which make up the Wesko unit were staked many years ago, but systematic prospecting only started in the summer of 1934, when the property was acquired by its present operators. Actual construction and development work began late in 1934. Since that time it has been pushed rapidly.

Geology

Geological characteristics of the vein greatly resemble those of the Yankee Girl vein which it parallels.

Veining materials consist of quartz with pyrite, galena, sphalerite, pyrrhotite and a small amount of chalcopyrite. Pyrrhotite is common in the lower levels but less common on the upper levels. Much brecciated and silicified country rock is included in the vein. Widths vary from mere stringers to 25 feet.

Ore values are principally in gold by there is also a content of silver, lead and zinc. The surface outcrops of the vein are thoroughly oxidized, containing limonite, quartz, manganite, some pyromorphite stained with cerussite.

PARAGENESIS OF WESKO ORE

Polished sections of "run of the mine" samples when etched with reagents according to the accompanying table show the minerals present to be:

1. Pyrite
2. Quartz
3. Sphalerite, Pyrrhotite, Chalcopyrite
4. Galena

Deposition appears to be in the order given above, pyrite being the oldest or first laid down.

MINERALS

Pyrite
Quartz
Sphalerite
Galena

Specimens examined together with those of the Yankee Girl ore. See pages 4 & 5

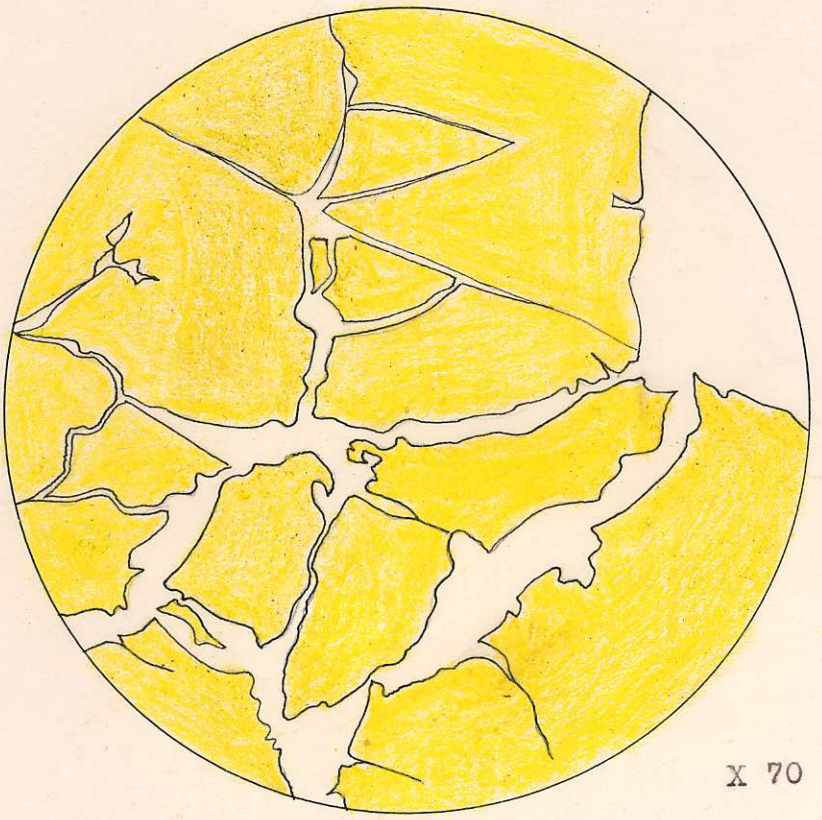
Pyrrhotite

Pyrrhotite is not very plentiful in the ore therefore it is somewhat harder to determine its place in the sequence of deposition. However, it does appear to be contemporaneous with sphalerite as the boundaries are quite regular and islands of it appear in the sphalerite.

Chalcopyrite

Only one specimen examined contained chalcopyrite. In the few places where it was present it appeared to be contemporaneously deposited with sphalerite. Where the boundaries are not smooth there is interpenetration of each mineral into the other as in figure 8.

Fig. 1.

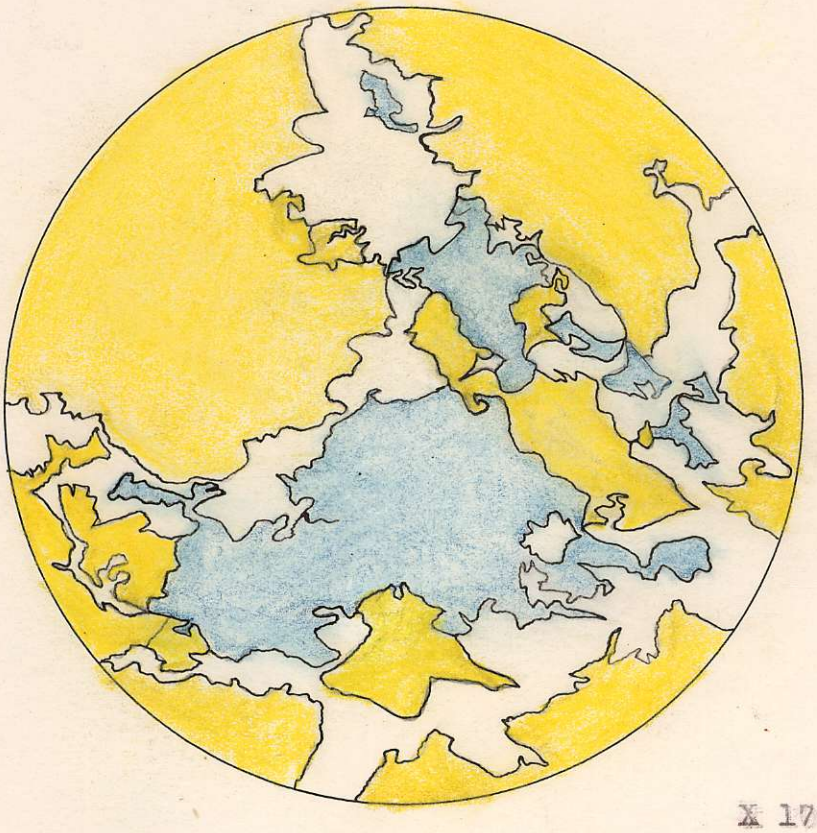


X 70

Minerals present: (1) Pyrite
(2) Quartz

Section shows fracturing of Pyrite and veining of Quartz in Pyrite.

Fig. 2.

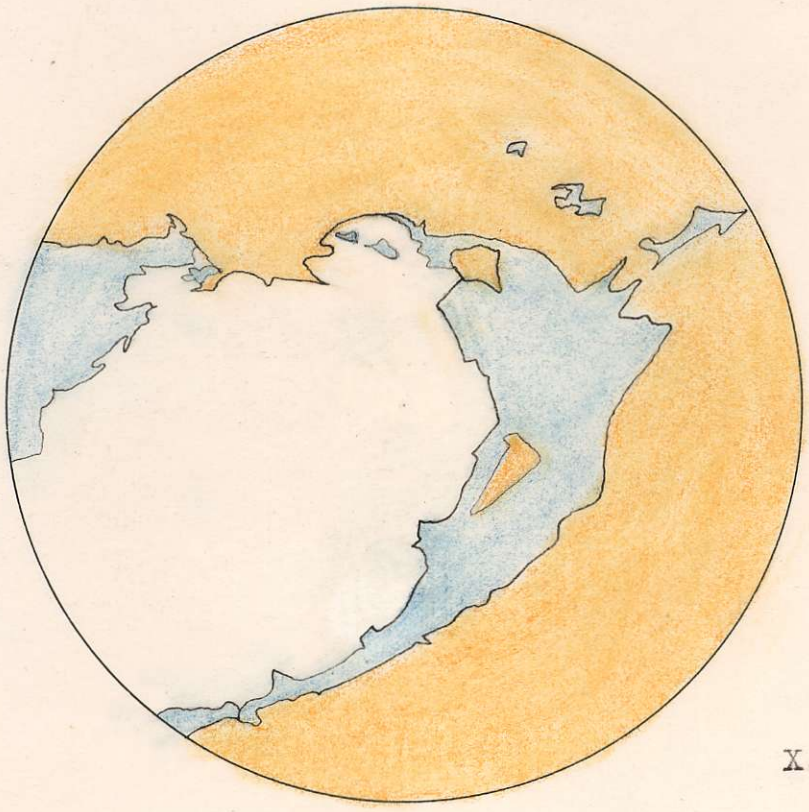


X 175

Minerals present: (1) Quartz
(2) Galena
(3) Pyrite

Section shows (1) Quartz eating into pyrite
(2) Galena eating into quartz

Fig. 3.

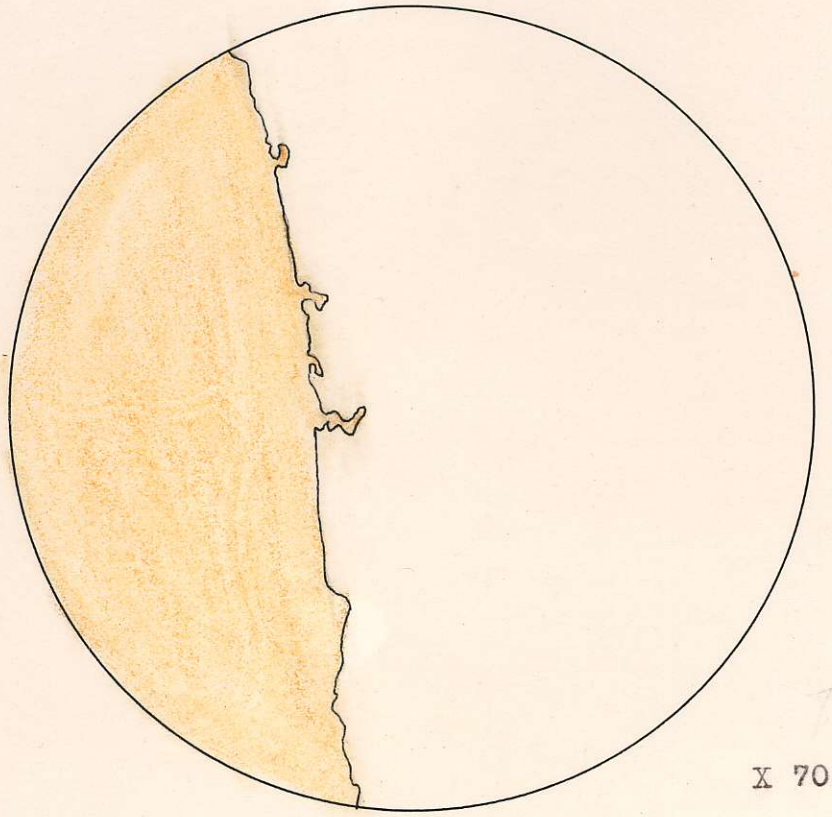


X 70

Minerals present: (1) Sphalerite
(2) Quartz
(3) Galena

Section shows galena appearing along the contact between sphalerite and quartz.

Fig. 4.

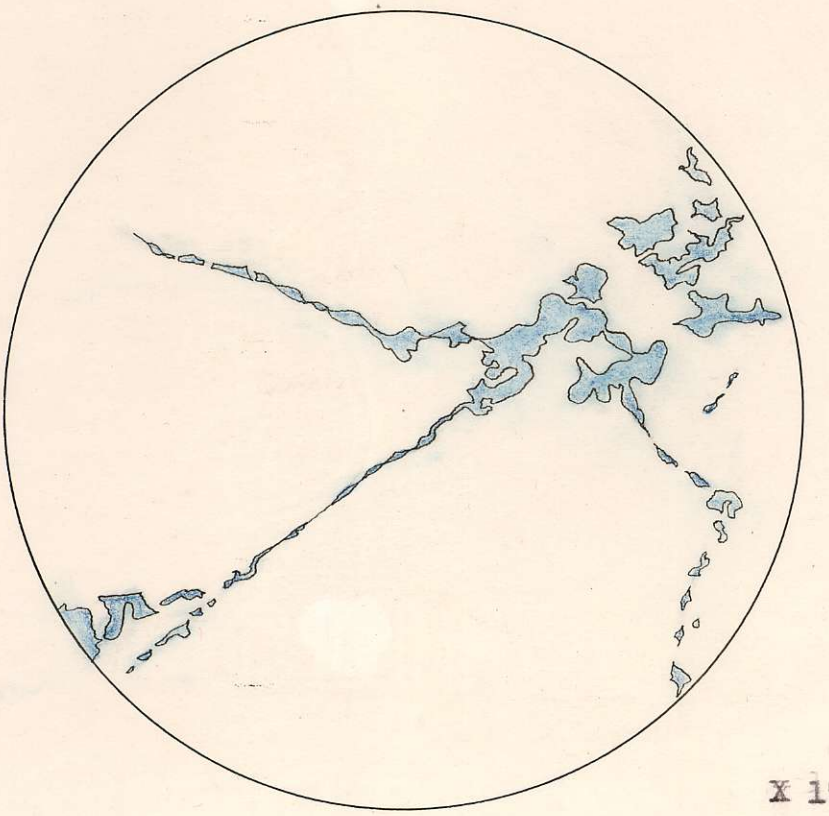


X 70

Minerals present: (1) Sphalerite
(2) Quartz

Section shows slight veining of Sphalerite in Quartz.

Fig. 5.

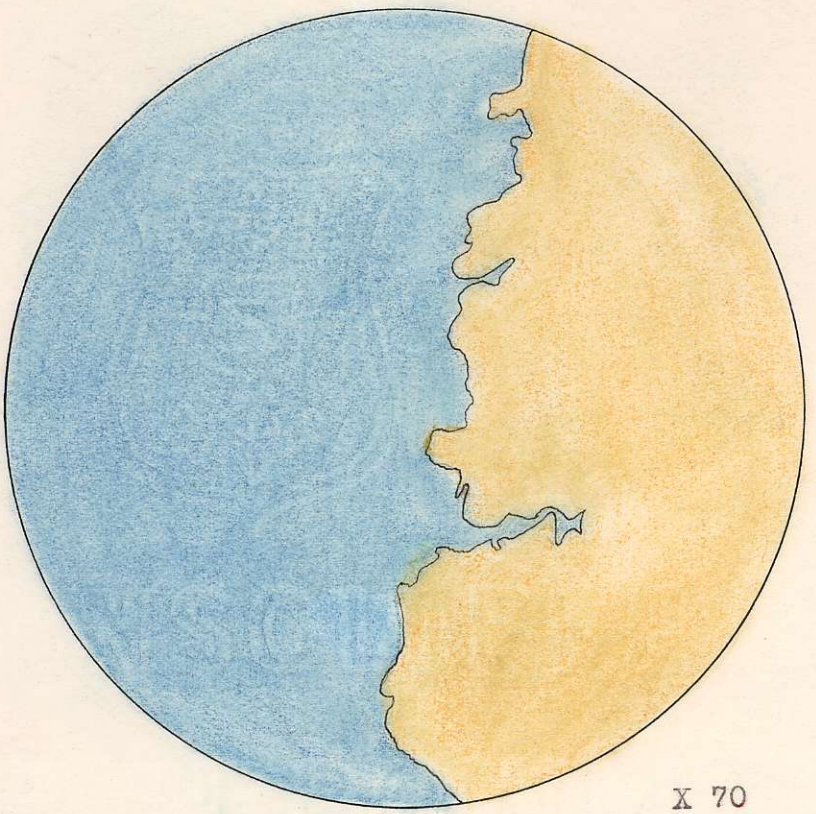


X 175

Minerals present; (1) Quartz
(2) Galena

Section shows galena veining the quartz.

Fig. 6.

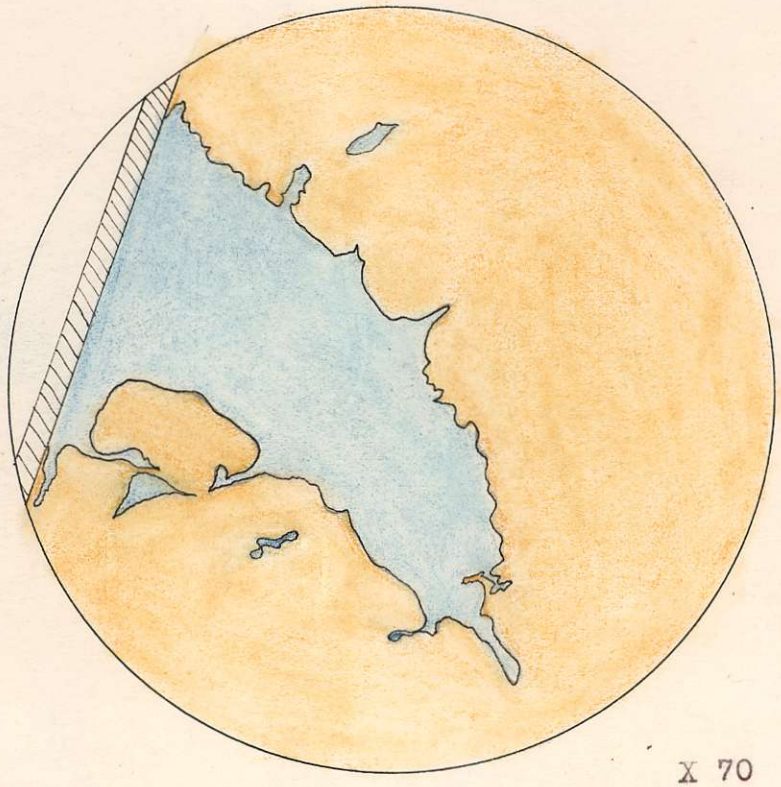


X 70

Minerals present: (1) Galena
(2) Sphalerite

Section shows Galena veining Sphalerite

Fig. 7.

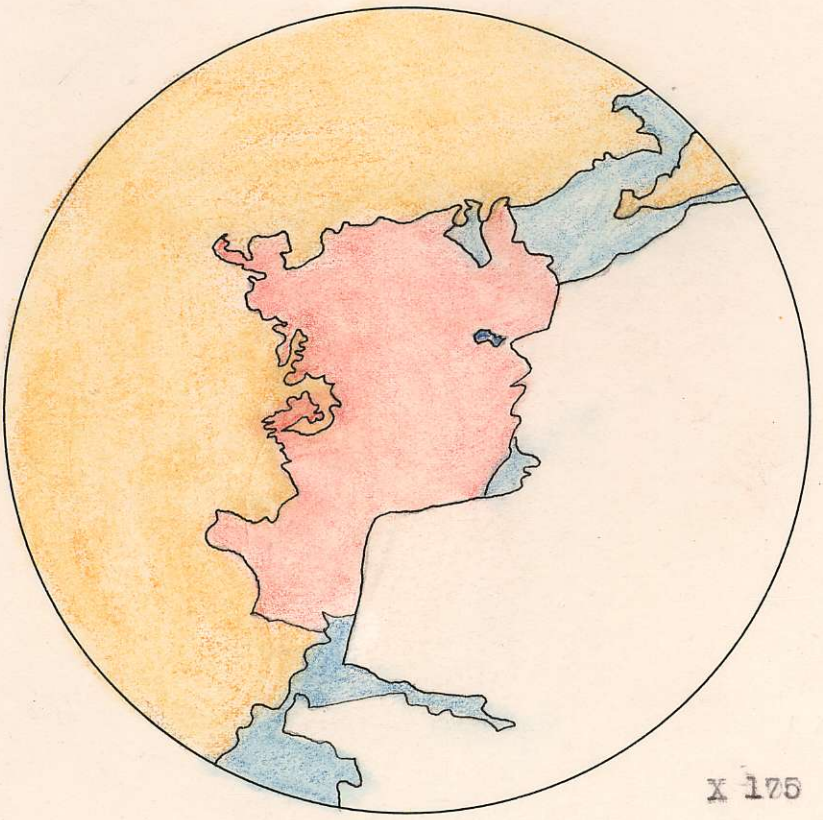


X 70

Minerals present: (1) Sphalerite
(2) Galena

Section shows Galena eating into the Sphalerite.

Fig. 8.

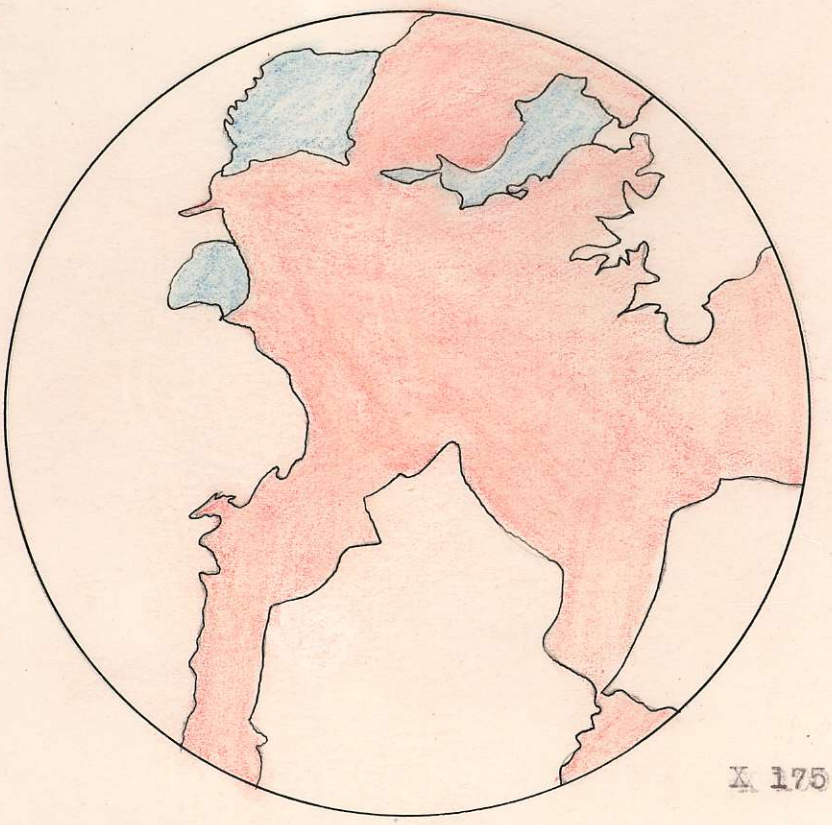


X 175

Minerals present: (1) Chalcopyrite
(2) Galena
(3) Sphalerite
(4) Quartz

Section shows interpenetration of Chalcopyrite and Sphalerite, also Galena replacing Chalcopyrite.

Fig. 9.



X 175

Minerals present: (1) Chalcopyrite
(2) Galena
(3) Quartz

Section shows Galena replacing Chalcopyrite, and Chalcopyrite veining Quartz

MINERAL	COLOR	HARDNESS	HNO_3	HCl	KCN	$FeCl_3$	KOH
CHALCOPYRITE	Brass Yellow	3.5	neg.	neg.	neg.	neg.	neg.
PYRRHOTITE	Pale Brown	4	Slight Tarnish	Slight Tarnish	neg.	neg.	Iridescent
PYRITE	Cream	6-6.5	Faint Brown	neg.	neg.	neg.	neg.
GALENA	White	2.5	Blackens	Faint Brown	neg.	Iridescent	neg.
SPHALERITE	Gray	3.5	Faint Brown	neg.	neg.	neg.	neg.
GOLD	Golden Yellow	Very Sectile	neg.	neg.	Quickly Darkens	neg.	neg.
BORNITE	Pinkish Brown	3	Brown with Efferves'e	neg.	neg.	neg.	neg.
ARSENOPYRITE	White	5.5	Darkens	neg.	neg.	neg.	neg.
HEMATITE	White	6	neg.	neg.	neg.	neg.	neg.
ARGENTITE	Grayish White	2-2.5	Slightly Brown	neg.	Slight Brown	Slowly Brown	neg.
STIBNITE	White	2	Slight Iridescence	neg.	Dissolves Surface	Instant Iridescence	neg.