

GEOLOGY 409
REPORT

ROSSLAND NEW

By Richard W. Oddy

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Rossland New

*No introduction
references.*

The specimens are of massive sulphide ore from the Bluebird and Mayflower properties south of Rossland, B.C. The ore is of the south belt type containing pyrite, pyrrhotite, sphalerite, chalcopyrite, boulangierite, arsenopyrite and galena.

The metals contained in the ore are zinc, lead, copper, gold, silver and cadmium. Cadmium is in the sphalerite and the gold is probably in pyrite and arsenopyrite. Gold values run from 0.02 to 0.42 oz./ ton. No gold was seen in the polished sections. The rare silver mineral owyheeite occurs and was seen in one polished section but no silver minerals are visible in the hand specimens. Argentiferous galena is probably responsible for some of the silver content but there is less than 5 per cent galena in the ore. Silver content is up to 25.1 oz. per ton.

The pyrite occurs as coarse crystals which have been brecciated and invaded by massive pyrrhotite, sphalerite, boulangierite and galena. Arsenopyrite occurs as crystals and crystal fragments scattered throughout the massive material. Chalcopyrite is massive and only occurs abundantly in a few specimens.

MICROSCOPE DESCRIPTION

1. Pyrite FeS₂

-coarsely crystallized and brecciated.

2. Arsenopyrite FeAs₂

white colour, hardness B
well crystallized with diamond shaped fragments
strong anisotropism - light yellow to greyish
HNO₃ - effervesces

*Did not lay down
found in black
& white.*

3. Pyrrhotite $Fe_{1-x}S$

bronze yellow to brownish colour
hardness D
anisotropic

4. Sphalerite $(Zn,Fe)S$

light grey colour, hardness C
isotropic
 HNO_3 - neg.

5. Chalcopyrite $CuFeS_2$

brass yellow colour
hardness C
" isotropic "

6. Boulangerite $5PbS \cdot 2Sb_2S_3$

white colour, hardness B, fibrous texture
strong anisotropism - white to dark grey
 HNO_3 - effervesces and stains brown

7. Galena PbS

galena white colour, triangular cleavage pits
hardness B
isotropic
 HNO_3 - blackens without effervescence

8. Owyheeite $8PbS \cdot 2Ag_2S \cdot 3Sb_2S_3$

greyish green tint, hardness B, prismatic structure
strong anisotropism - yellowish white to grey
 HNO_3 - stains differentially iridescent
A rare mineral and hard to identify; associated with the boul-
angerite.

How?

Mode of the ore (Primary ore minerals)

Pyrite	30 %	
Pyrrhotite	20 %	
Sphalerite	20 %	
Chalcopyrite	8 %	
Boulangerite	12 %	Arsenopyrite 5 %
Galena	-5 %	
Owyheeite	-1 %	

Textures

Pyrite is coarse grained, well crystallized and strongly brecciated. The fragments are surrounded by later pyrrhotite, sphalerite and boulang-erite. Arsenopyrite is also coarse grained and well crystallized. Much of it occurs as crystals scattered in the boulang-erite.

Pyrrhotite, sphalerite and boulang-erite are massive and are all later than the pyrite and arsenopyrite since they form the matrix of the breccia-
ted ore. Replacement textures (veining, inclusions) between the three massive sulphides just named indicate that boulang-erite replaces sphalerite and pyrrhotite and sphalerite replaces pyrrhotite.

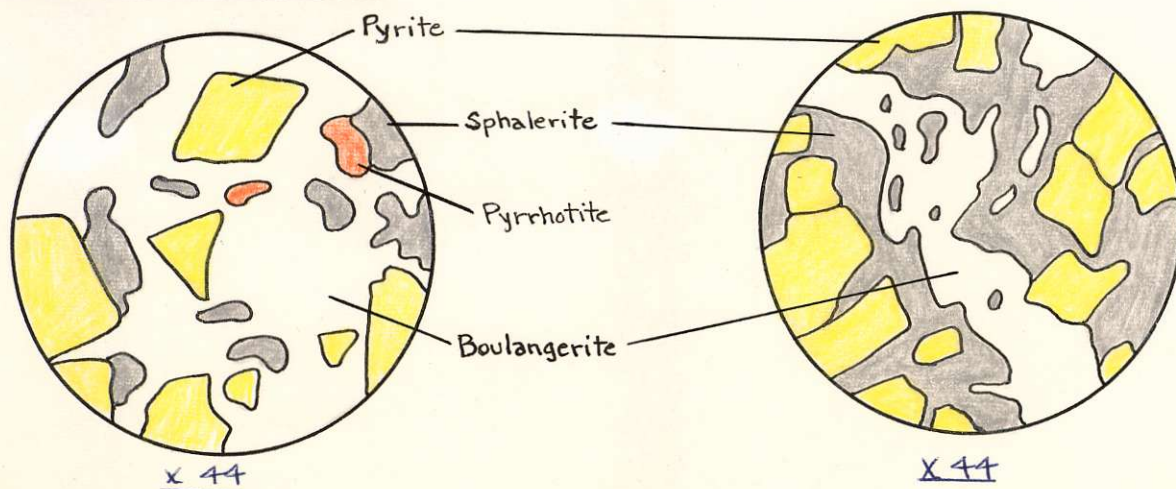
Chalcopyrite is seen in fractures in brecciated pyrite and around grains of arsenopyrite and is therefore later than the other two. The relationship between chalcopyrite and pyrrhotite, sphalerite and boulang-erite is unknown since they are not seen to be in contact.

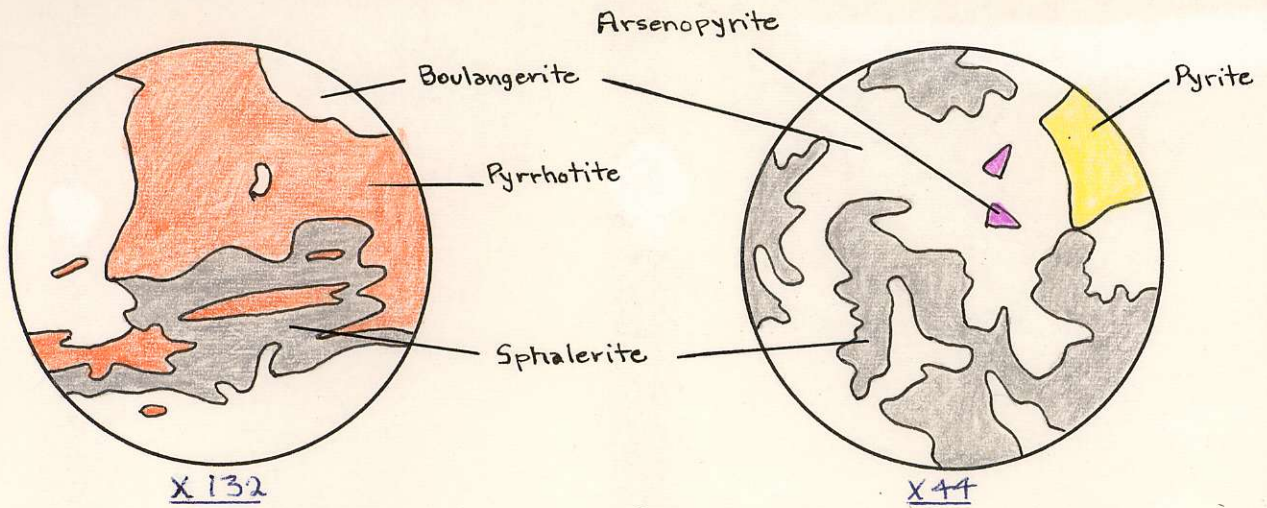
Galena is not very abundant but it is found associated with sphal-erite which it appears to replace.(?)

Owyheeite was only seen in one specimen. It occurs in boulang-erite and has probably been exsolved from it.

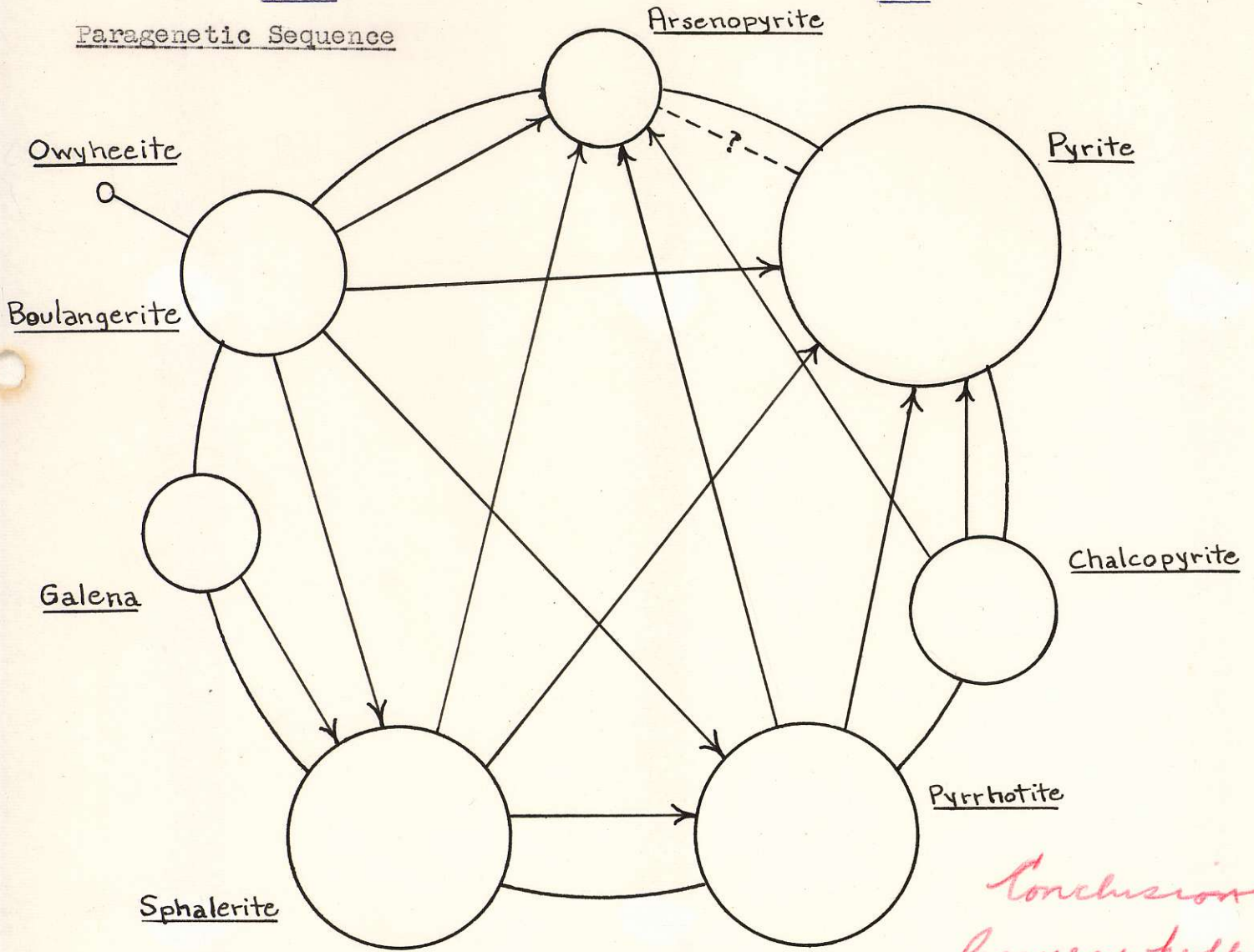
A mineral banding is exhibited by some of the ore specimens. This consists of bands of strongly brecciated pyrite surrounded by pyrrhotite and sphalerite alternating with bands of mainly just massive boulang-erite.

Illustration of Textures





Paragenetic Sequence



*Conclusions
Recovery problems*

Type of Deposit

This is a mesothermal replacement deposit of massive sulphides.