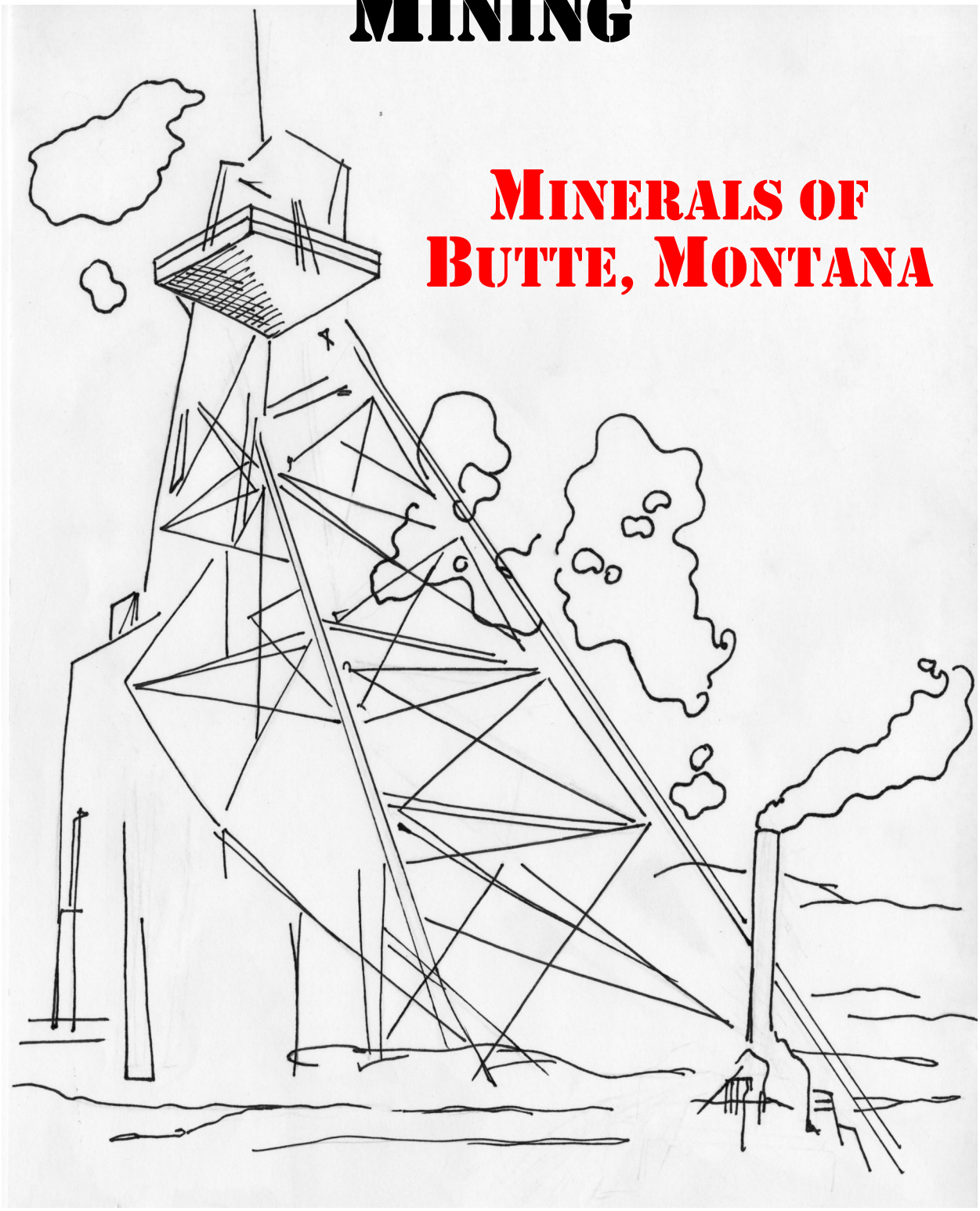
World Museum of Mining



Minerals of Butte, Montana

Introduction

Minerals are not made by humans. They have never been alive, and they are not made from plants or animals. Minerals are not a liquid or a gas.

What are minerals?

Minerals are found in nature and have a definite chemical composition.

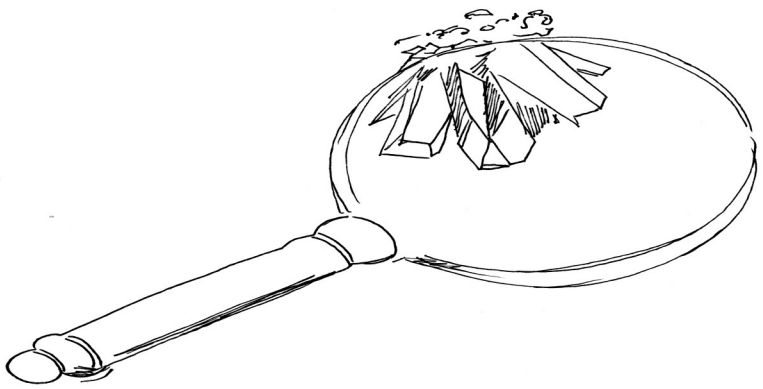
Where are minerals found?

Minerals are found in cars, toothpaste, your clothes, clocks, desks, food, pencils, your body….EVERYWHERE! We could not exist without the presence of minerals.

How can you identify a mineral?

Color is one way to classify a mineral, but you can't identify a mineral by its color alone. You must become a detective when identifying different minerals. This book describes many, but not all, of the physical properties of minerals that can be found in Butte-Silver Bow. Look at as many properties as you can in order to identify your specimen as accurately as possible. Become a mineral detective by looking at the different colors, shapes, hardness, streak and weight of the minerals that surround you.

This book is only a partial list of minerals that have been mined in Butte. The actual mineral specimens included in Minerals of Butte, MT can be seen at the World Museum of Mining.



Physical Properties of Minerals Defined

Color: Often the first property we notice is the color of the mineral. Although color helps narrow down the field of possibilities, many minerals appear in several different colors.

Hardness: How easy or difficult it is to scratch the surface of the mineral. The Mohs scale helps to identify the hardness of a mineral from softest to hardest:

1 = Talc; 2 = Gypsum; 3 = Calcite; 4 = Fluorite; 5 = Apatite; 6 = Orthoclase; 7 = Quartz;

8 = Topaz; 9 = Corundum; 10 = Diamond.

Common items can be used to help determine the hardness of a mineral:

Fingernail = 2.5; Copper Coin = 3.5; Nail = 5; Knife = 5.5; Glass = 6-7; Metal File = 6.5.

Cleavage: The pattern that is formed when the mineral splits into flat surfaces due to stress. The split can be described as poor, fair, good or perfect.

Fracture: The way a mineral or rock breaks into a form or shape. The fracture may be defined as **conchoidal** meaning that there is a circular pattern in the break. A **poor/indistinct** fracture indicates that there is no circular pattern or any directional cleavage.

Luster: The way the mineral shines. Luster may be described as metallic, glassy/vitreous, adamantine, dull, earthy/chalky, silky, greasy or pearly.

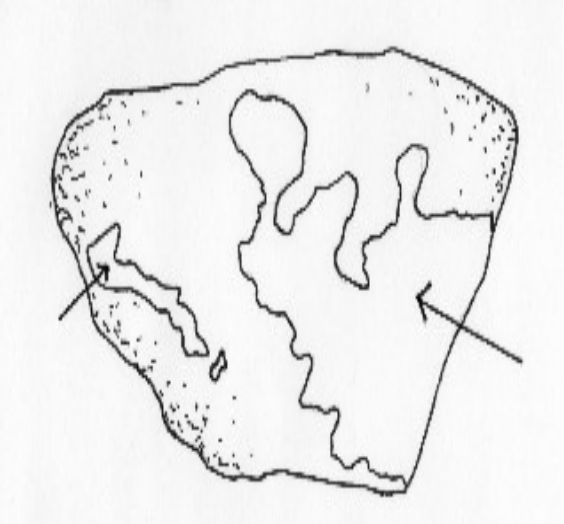
Streak: The color of the mineral when it is reduced to powder and rubbed across a plate. The color of the powder may not be the same color as the mineral.

Specific Gravity: The weight of a mineral compared to the volume of water at 4^0 C.

Crystal System: The length of axes in crystals and the angles at which they intersect are how you determine which Crystal System a mineral is in. There are seven crystal systems in which a mineral can be classified: Hexagonal, Tetragonal, Orthorhombic, Monoclinic, Trigonal, Isometric and Triclinic.

AZURITE

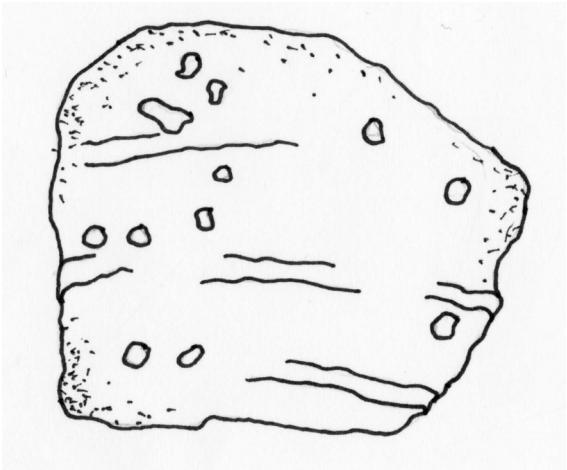
$Cu_3(CO_3)_2(OH)_2$



Color: Azure Blue, Light Blue, or Dark Blue
Hardness: 3½- 4
Cleavage: Perfect
Fracture: Conchoidal
Luster: Glassy/Vitreous
Streak: Light Blue
Specific Gravity: 3.834 g/cm^3
Crystal System: Monoclinic
Uses: Azurite is used in jewelry, in dyes, and is a minor ore of copper.
Other Interesting Facts: Azurite's name is derived from the Persian word *lazhward* meaning blue, and was named Azurite in 1824.

BARITE

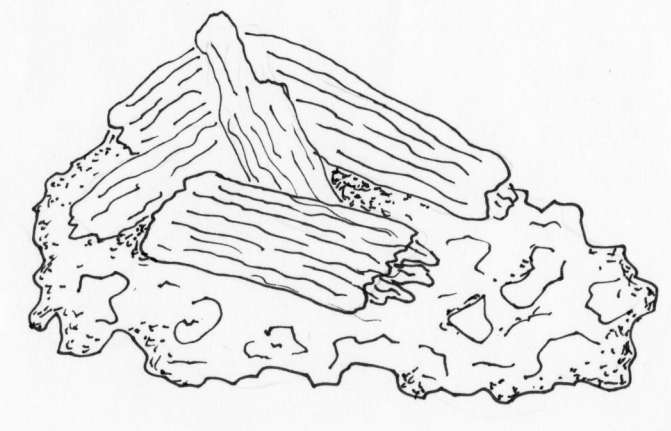
$BaSO_4$



Color: Colorless, White, Blue, Green, Yellow and Red Shades
Hardness: 3–3 1/2
Cleavage: Perfect in one direction
Fracture: Conchoidal
Luster: Glassy/Vitreous
Streak: White
Specific Gravity: 4.5 g/cm^3
Crystal System: Orthorhombic
Uses: Ore of Barium. Crushed Barite is used in the process of drilling oil wells, and in the manufacturing of paper and rubber.
Other Interesting Facts: Barite is often mistaken for celesite. When put under a flame test, barite will burn pale green, where as celesite's flame will be red. The name barite is derived from the Greek word meaning heavy.

BETEKHTINITE

$Cu_{10}(Fe, Pb)S_6$

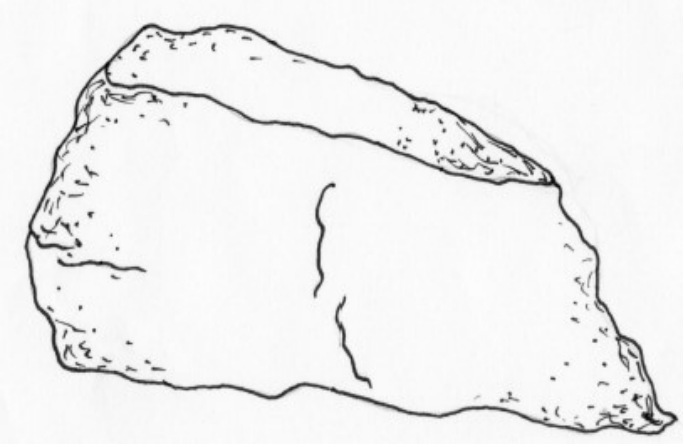


Color: Brownish Black
Hardness: 3 – 3.5
Cleavage: Distinct/Good in three directions.
Fracture: Unknown
Luster: Metallic
Streak: Black
Specific Gravity: 5.96-6.05 g/cm^3
Crystal System: Orthorhombic
Uses: None known. Rare mineral.
Other Interesting Facts: Betekhtinite is named after Russian mineralogist and economic geologist, Georgievich Betekhtin (1742-1791), and was discovered in 1955.

* Specimen courtesy of Joe Slouber

BORNITE

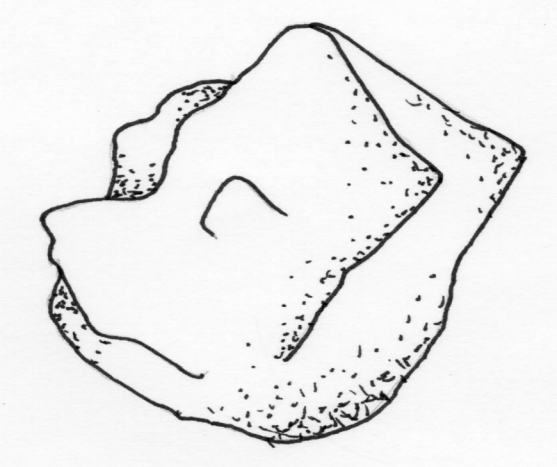
Cu_5FeS_4



Color: Copper-Red tarnishing to an Iridescent Purplish surface also tarnishing to Black
Hardness: 3
Cleavage: Poor/Indistinct
Fracture: Conchoidal
Luster: Metallic
Streak: Gray– Black
Specific Gravity: 5.09 g/cm^3
Crystal System: Orthorhombic
Uses: Bornite is an important ore of copper.
Other Interesting Facts: Bornite has been known by different names since 1725. In 1845, it was named in honor of Austrian mineralogist Ignaz von Born (1742-1791).

CALCITE

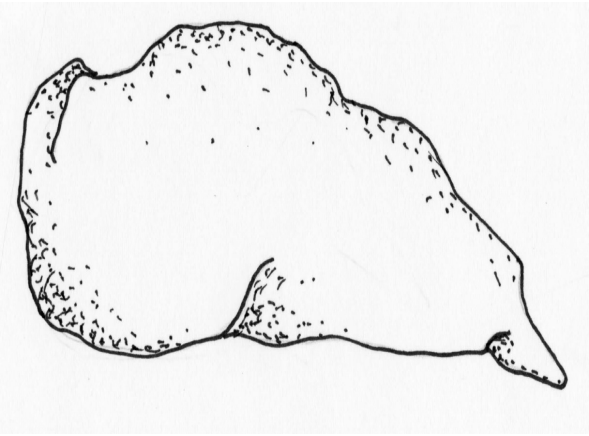
$CaCO_3$



Color: Found in various colors
Hardness: 3
Cleavage: Perfect
Fracture: Conchoidal
Luster: Vitreous/Pearly
Streak: White
Specific Gravity: 2.711 g/cm^3
Crystal System: Trigonal
Uses: Calcite has more uses than almost any other mineral. It is used in construction materials, abrasives, pigments, cement, and fertilizers. Calcite also has pharmaceutical uses.
Other Interesting Facts: Calcite's name is derived from the Latin word *calx* meaning lime.

CHALCANTHITE

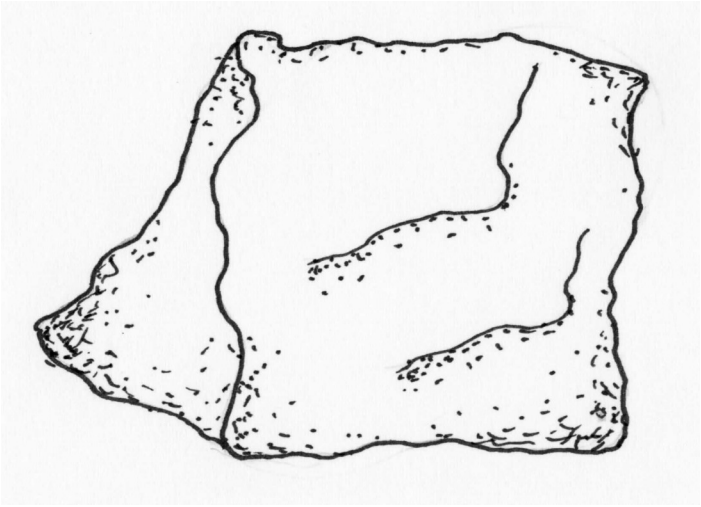
$CuSO_4 \cdot 5H_2O$



Color: Green, Green Blue, Light Blue, or Dark Blue.
Hardness: 2½
Cleavage: Imperfect/Fair
Fracture: Conchoidal
Luster: Glassy/Vitreous
Streak: White
Specific Gravity: 2.282 g/cm^3
Crystal System: Triclinic
Uses: Chalcanthite is a minor ore of copper. It is also found in insecticides and is used for industrial purposes.
Other Interesting Facts: Discovered in 1853, chalcanthite received its name from the Greek words *chalkos* meaning copper and *anthos* meaning flower.

CHALCOCITE

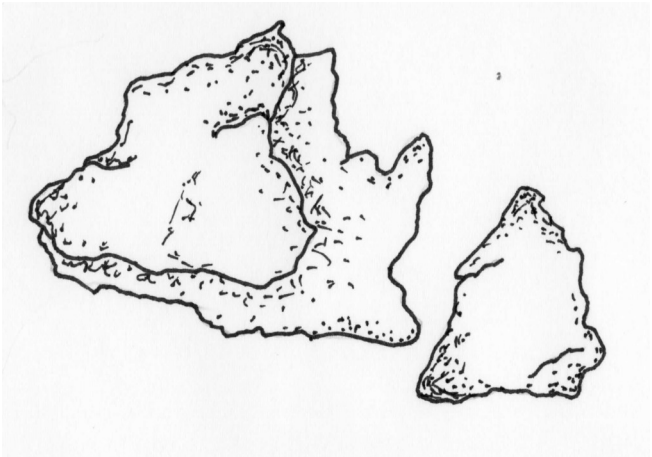
Cu_2S



Color: Found in different shades of Black.
Hardness: 2½-3
Cleavage: Poor/Indistinct
Fracture: Conchoidal
Luster: Metallic
Streak: Blackish Lead Gray
Specific Gravity: 5.8 g/cm^3
Crystal System: Monoclinic
Uses: Chalcocite is an important ore of copper.
Other Interesting Facts:
Chalcocite's name is derived from the Greek word *chalkos* meaning copper.

CHALCOPYRITE

$CuFeS_2$



Color: Brassy Yellow, often with an iridescent tarnish
Hardness: 3½-4
Cleavage: Poor and indistinct
Fracture: Irregular/Uneven
Luster: Metallic
Streak: Greenish Black
Specific Gravity: 4.18 g/cm^3
Crystal System: Tetragonal
Uses: A major ore of copper.
Other Interesting Facts:
Chalcopyrite's name is derived from the Greek word *chalkos* meaning copper and *pyrites* meaning strike fire.

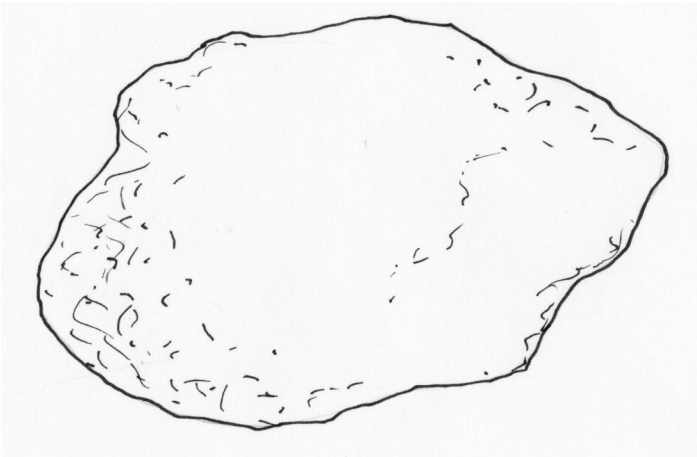
CHRYSOCOLLA

$(Cu, Al)_2H_2Si_2O_5(OH)_4 \cdot nH_2O$

Color: Green, Bluish Green, Blue, Blackish Blue, or Brown
Hardness: 2½ - 3½
Cleavage: None observed
Fracture: Irregular/Uneven; Sub-Conchoidal
Luster: Vitreous, Waxy, and Earthy
Streak: Light Green
Specific Gravity: 1.93 g/cm^3
Crystal System: Orthorhombic
Uses: Mainly used as a copper ore. Chrysocolla is usually too soft to use in jewelry.
Other Interesting Facts: The name Chrysocolla is derived from the Greek *chrysos* meaning gold and *kolla* meaning glue.

COLUSITE

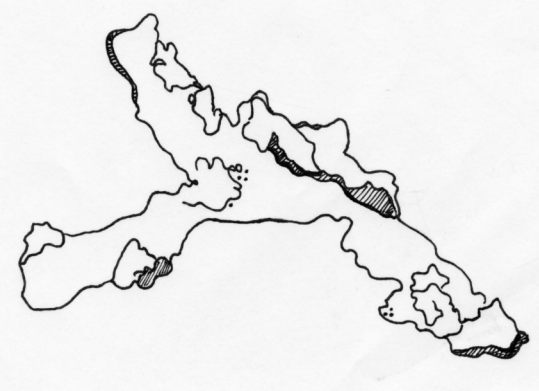
$Cu_{26}V_2(As,Sn,Sb)_6S_{32}$



Color: Bronze, Pinkish Bronze
Hardness: 3-4
Cleavage: None observed
Fracture: Irregular/Uneven
Luster: Metallic
Streak: Black
Specific Gravity: 4.63 g/cm^3
Crystal System: Isometric
Uses: None found
Other Interesting Facts: Colusite is named after the Colusa Mine in Butte, Montana, where it was first discovered in 1932.

COPPER

Cu

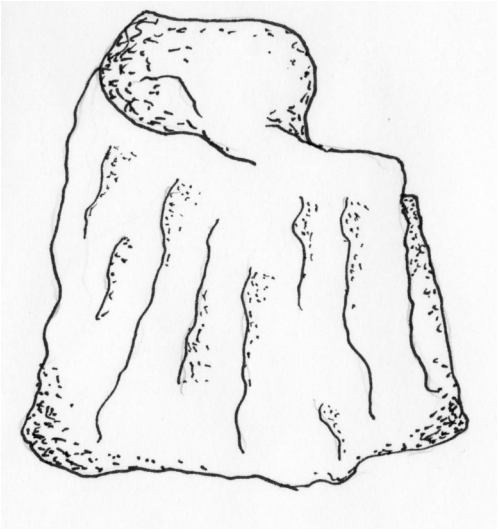


Color: Copper; weathered specimens are Tarnished Green
Hardness: 2½-3
Cleavage: None observed
Fracture: Jagged
Luster: Metallic
Streak: Reddish Copper
Specific Gravity: 8.9 g/cm^3
Crystal System: Isometric
Uses: Copper is used in electrical wires due to its ability to conduct electricity. Copper is also found in pots and pans, roofing and building materials, water pipes, and pharmaceutical machinery. When mixed with tin, the alloy Bronze is created. When combined with zinc, the alloy brass is formed.
Other Interesting Facts: Copper has been mined for centuries and is only found in limited areas.

Copper is ultimately the reason behind Butte's slogan "The Richest Hill on Earth". It all started when Marcus Daly came to Butte in 1876 to mine silver. Why not copper? He and his company believed that silver was going to be the most abundant mineral in Butte at the time. Daly discovered quickly that a large byproduct of silver ore is copper. The demand for electricity was high in the early 1880's, but silver was much too expensive to use for electrical wiring. Copper was a cheaper, better, and more abundant alternative. By 1882 over nine million pounds of copper had already been mined in Butte. Over 50% of the U.S. copper came from Butte in the early 1900's. This copper was used for electrical wiring, plumbing pipes, and, entering into WWI, bullets. We can thank the vast amount of this mineral as a major contributor to Butte's huge history and character.

COVELLITE

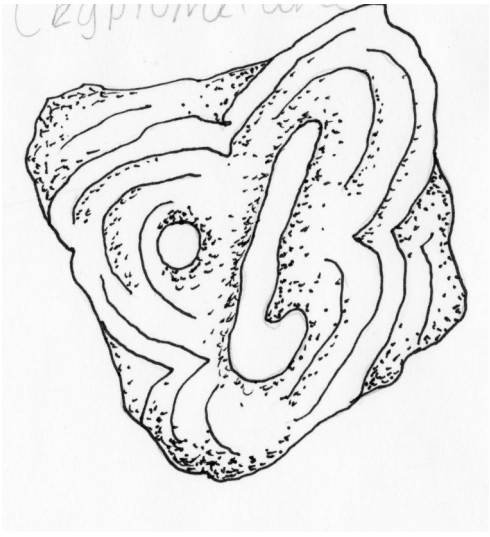
CuS



Color: Indigo-Blue or darker. Often iridescent with Purplish, Deep Red, and Brassy-Yellow reflections.
Hardness: 1½-2
Cleavage: Perfect
Fracture: Irregular/Uneven
Luster: Sub-metallic
Streak: Shiny Metallic, Lead-Gray to Black
Specific Gravity: 4.062 g/cm^3
Crystal System: Hexagonal
Uses: It is an important ore of copper.
Other Interesting Facts: Covellite is named in honor of Niccolo Covelli(1790-1829), an Italian mineralogist and discoverer of the mineral at Mount Vesuvius in 1832.

CRYPTOMELANE

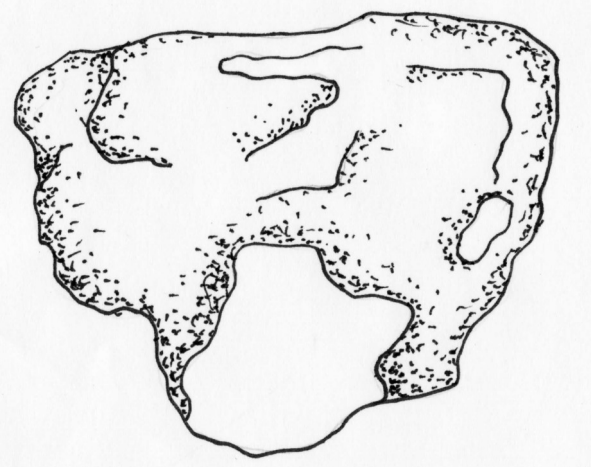
$K(Mn^{+4},Mn^{+2})_8O_{16}$



Color: Brown and Grayish-White
Hardness: 5-6½
Cleavage: Unknown
Fracture: Conchoidal
Luster: Earthy
Streak: Brownish Black
Specific Gravity: 4.36 g/cm^3
Crystal System: Monoclinic
Uses: Cryptomelane is a minor ore of manganese.
Other Interesting Facts: Cryptomelane's name came from the Greek words meaning hidden and black.

CUPRITE

Cu_2O

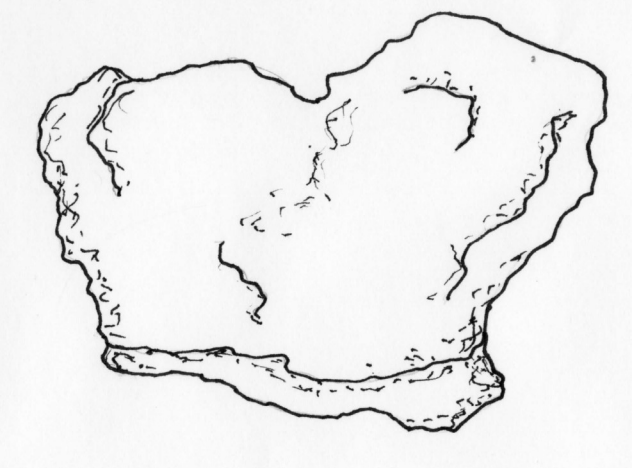


Color: Dark Red sometimes almost Black
Hardness: 3½-4
Cleavage: Fair
Fracture: Conchoidal
Luster: Adamantine, Sub-Metallic, earthy
Streak: Shining Metallic, Brownish-Red
Specific Gravity: 6.15 g/cm^3
Crystal System: Isometric
Uses: A major ore of copper.

Other Interesting Facts: Cuprite was named in 1845 from the Latin *cuprum* in reference to its composition.

DIGENITE

Cu_9S_5



Color: Gray to Grayish Black, turning Bluish when exposed to air
Hardness: 2½-3
Cleavage: Poor/Indistinct
Fracture: Conchoidal
Luster: Sub-Metallic
Streak: Grayish Black
Specific Gravity: 5.706 g/cm^3
Crystal System: Trigonal
Uses: Digenite is an important ore of copper.

Other Interesting Facts: First discovered in 1884, digenite's name is from the Greek word meaning of two origins, because it is related to chalcocite and covelite.

DJURLEITE

$Cu_{31}S_{16}$

No Speciman Available

Color: Lead Gray, Blue Black, Black, Black Gray
Hardness: 2.5 - 3
Cleavage: None
Fracture: Brittle/Conchoidal
Luster: Metallic
Streak: Metallic
Specific Gravity: 5.63 g/cm^3
Crystal System: Monoclinic

Uses: Ore of copper.
Other Interesting Facts: Djurleite is named for Seved Djurle, who first produced the compound before the mineral was discovered. Djurleite is often confused for chalcocite.

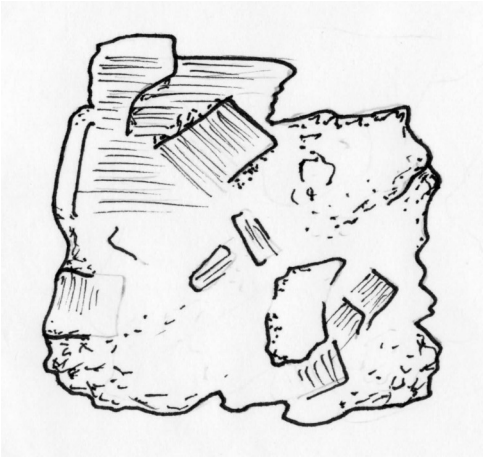
DOLOMITE

$CaMg(CO_3)_2$

Color: White, Gray, Reddish-White, or Pink
Hardness: 3½-4
Cleavage: Perfect
Fracture: Brittle/Conchoidal
Luster: Vitreous/Pearly
Streak: White
Specific Gravity: 2.876 g/cm^3
Crystal System: Trigonal
Uses: Dolomite is used in building stones, refractory bricks for furnace linings, and is an ornamental stone. It is also an ore of metallic magnesium.
Other Interesting Facts: Dolomite was named in 1791 after French mineralogist and geologist D. de Dolomieu (1750-1801).

ENARGITE

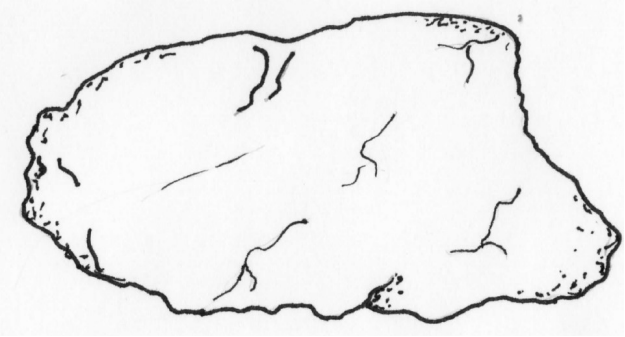
Cu_3AsS_4



Color: Grayish-Black to Black, Gray
Hardness: 3
Cleavage: Perfect
Fracture: Irregular/Uneven
Luster: Metallic
Streak: Black
Specific Gravity: 4.40 g/cm^3
Crystal System: Orthohombic
Uses: A minor ore of copper.
Other Interesting Facts: First found in 1850, enargite received its name from a Greek word meaning distinct due to its cleavage.

FLUORITE

CaF_2

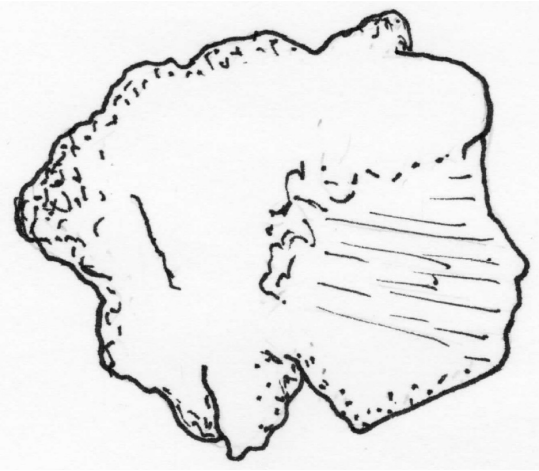


Color: Purple, Lilac, Golden-Yellow, Green, Colorless, Blue, Pink, Champagne, Brown
Hardness: 4
Cleavage: Perfect
Fracture: Conchoidal/Uneven
Luster: Vitreous
Streak: White
Specific Gravity: 3.181 g/cm^3
Crystal System: Isometric
Uses: A flux* in iron smelting, used in optical lenses, found on non-stick surfaces of pots and pans. Fluorite is also used to fight cavities in your toothpaste.
Other Interesting Facts: Fluorite's name came from the Latin word *fluere* meaning to flow. Fluorite was first found in 1529.

** Flux is a material that lowers the melting temperature of a metal.*

GALENA

PbS



Color: Lead Gray
Hardness: 2½
Cleavage: Perfect
Fracture: Uneven
Luster: Metallic
Streak: Lead-Gray
Specific Gravity: 7.57 g/cm^3
Crystal System: Isometric
Uses: Galena is a major ore of lead and silver.
Other Interesting Facts: The word *galena* is Latin for lead ore.

GOLD

Au

Color: Rich Yellow, Paling to Whitish- Yellow with increasing Silver.
Hardness: 2½-3
Cleavage: None observed
Fracture: Hackly
Luster: Metallic
Streak: Shining Yellow
Specific Gravity: 19.309 g/cm^3
Crystal System: Isometric

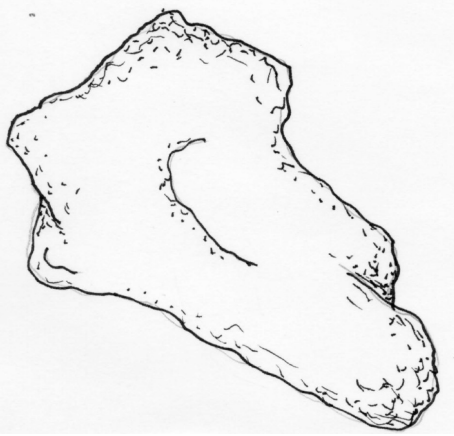
Uses: Gold is a highly valued mineral. Gold is used in coinage, electronics, medicine, computers, awards, pigments, optics, jewelry and medallions. Since gold is strong and does not rust, you might find gold in your mouth in the form of a filling.

Other Interesting Facts: The word gold comes from the Old English word *geolu*, which means yellow.

In 1864 the first placer gold was found in Butte by William Allison and G.O. Humphreys. William Farlin decided to mine gold he had found shortly after Allison and Humphreys. This is when the Silver Bow camp was founded and local mining truly began. By 1867, approximately $1.5 million in gold had been mined in the Butte area. Just a short seven years later, gold became scarce and hard to find.

GYPSUM

$CaSO_4 \cdot 2H_2O$



Color: Colorless, White, Gray, Brown, Beige, Orange, Pink, Yellow, Light Red, Green
Hardness: 2
Cleavage: Perfect
Fracture: Uneven
Luster: Vitreous to Pearly
Streak: White
Specific Gravity: 2.35 g/cm^3
Crystal System: Monoclinic
Uses: Gypsum is the primary ingredient in plaster-of-Paris and is used in the production of cement. The mineral gypsum can be found in sheet rock, earthenware, and fertilizer. Gypsum is also used in casts that are used to help broken bones heal.

Gypsum is found in several varieties, which include: Alabaster, Desert Rose, Gypsum Flower, Gypsum Rock, Ram's Horn, Sand Gypsum, Satin Spar and Selenite. The specimen pictured is Selenite whose name came from the Greek word meaning moon.

LEAD

Pb

Color: Whitish-Gray
Hardness: 1 1/2
Cleavage: Absent
Fracture: Jagged
Luster: Metallic
Streak: Gray
Specific Gravity: 11.3 g/cm3
Crystal System: Isometric

No Speciman Available

Uses: Lead was once found in water pipes and paint. It is now more commonly found in lead-acid batteries, casting metals, sheet lead and oxides in glass and ceramics.

Other Interesting Facts: Lead is rarely found in its native form. It is found combined with additional elements which form other minerals, such as galena.

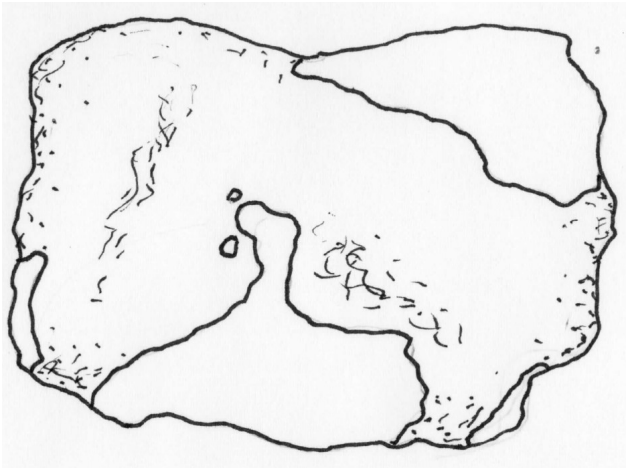
MALACHITE

$Cu_2(CO_3)(OH)_2$

Color: Green, Dark Green, or Blackish Green
Hardness: 3½-4
Cleavage: Perfect
Fracture: Irregular/Uneven
Luster: Adamantine, Vitreous, Silky, Dull, Earthy
Streak: Light Green
Specific Gravity: 4 g/cm^3
Crystal System: Monoclinic
Uses: Malachite is an ore of copper, is used in jewelry and used as an ornamental material for vases.
Other Interesting Facts: Malachite is named after a Greek word that means mallows, which references the green color of leaves.

MOLYBDENITE

MoS_2



Color: Black, Lead-Gray, or Gray
Hardness: 1-1½
Cleavage: Perfect
Fracture: Flaky
Luster: Metallic
Streak: Bluish Gray
Specific Gravity: 4.998 g/cm^3
Crystal System: Hexagonal
Uses: A major ore of molybdenum. Molybdenite may also be a possible replacement semiconductor for silicon in transistors of electronic chips.
Other Interesting Facts: Molybdenite's name is derived from the Greek work *molybdos* meaning lead.

POLYBASITE

$(Ag, Cu)_{16}Sb_2S_{11}$

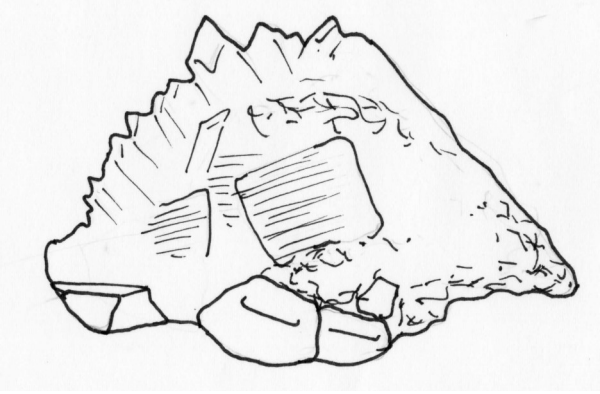
No Speciman Available

Color: Black, Dark Ruby Red
Hardness: 2.5 - 3
Cleavage: Poor
Fracture: Conchoidal
Luster: Sub Metallic
Streak: Reddish Black
Specific Gravity: 6.1 g/cm^3
Crystal System: Monoclinic
Uses: Polybasite is an ore of silver.

Other Interesting Facts: Named from the Greek words *poly* meaning many and *basis* meaning a base.

PYRITE

FeS_2

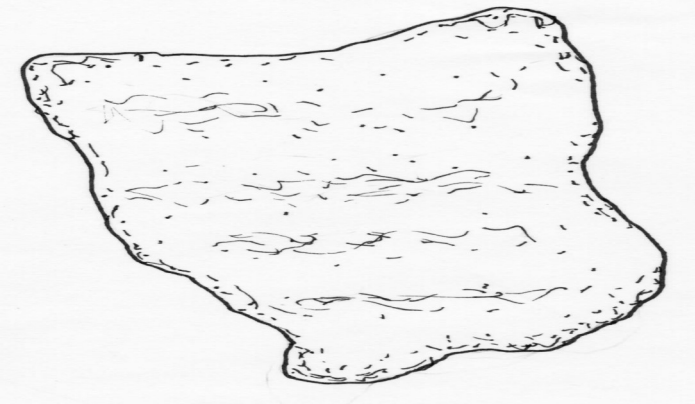


Color: Pale Brass to Yellow
Hardness: 6-6½
Cleavage: Poor/Indistinct
Fracture: Conchoidal
Luster: Metallic
Streak: Greenish-Black
Specific Gravity: 5.01 g/cm^3
Crystal System: Isometric
Uses: Pyrite is common among collectors. The main use of pyrite today is in the production of sulfur dioxide for the paper industry and sulfuric acid for the chemical industry. It is also used to make rubber tires and some medicines.

Other Interesting Facts: Named in antiquity from the Greek *pyr* for fire. Sparks fly from pyrite when hit with another mineral or metal. Pyrite is commonly referred to as Fool's Gold.

PYROLUSITE

MnO_2

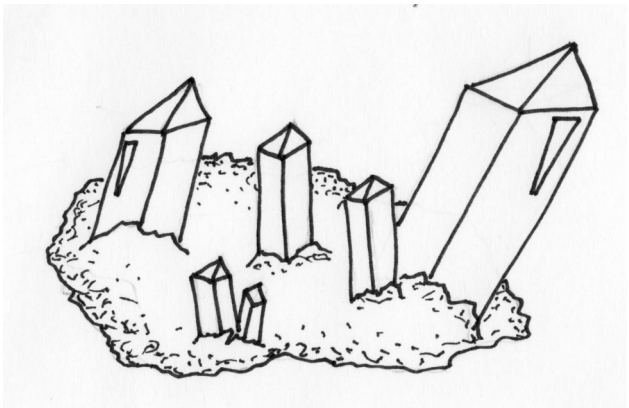


Color: Black or Very Dark Gray
Hardness: 2-6½
Cleavage: Perfect
Fracture: Irregular/Uneven
Luster: Metallic
Streak: Black to Bluish Black
Specific Gravity: 5.189 g/cm^3
Crystal System: Tetragonal
Uses: It is a major ore of manganese. Pyrolusite is also used in the manufacture of steel and manganese bronze.

Other Interesting Facts: Pyrolusite was named in 1827 from the Greek word meaning fire and to wash, since it was used to remove brown and green colored tints in the making of glass.

QUARTZ

SiO_2

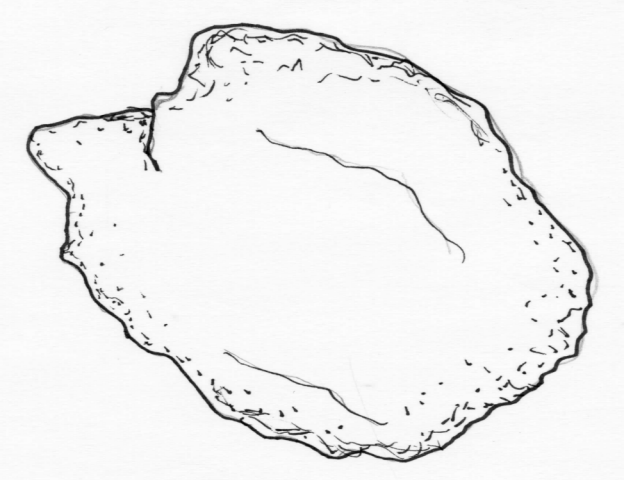


Color: Found in various colors.
Hardness: 7
Cleavage: Poor/indistinct
Fracture: Conchoidal
Luster: Vitreous
Streak: White
Specific Gravity: 2.66 g/cm^3
Crystal System: Trigonal
Uses: Quartz is used in a variety of ways including silica for glass, electrical components, optical lenses, abrasives, gemstones, ornamental stone, and building stone.

Other Interesting Facts: The name quartz came from the German word *quarz* which is of uncertain origin. Quartz is one of the most common minerals found on Earth's surface.

RHODOCHROSITE

$MnCO_3$

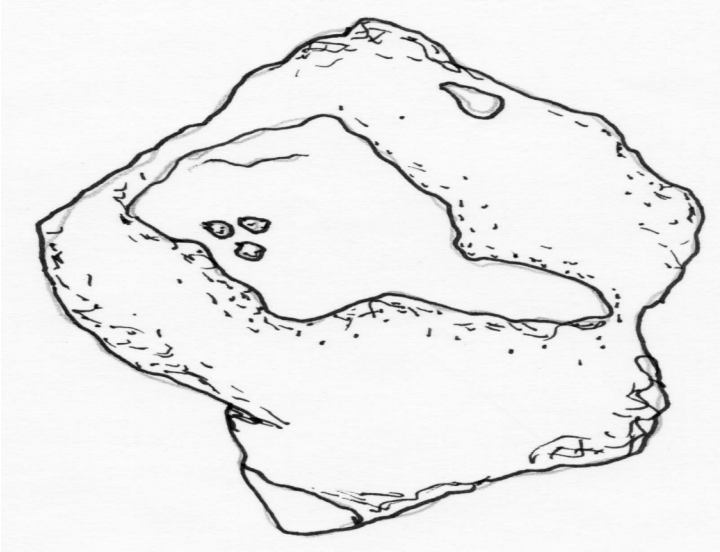


Color: Pink, Rose, Red, Yellowish-Gray, Brown, White, Gray
Hardness: 3½
Cleavage: Perfect
Fracture: Irregular/Uneven
Luster: Vitreous, Pearly
Streak: White
Specific Gravity: 3.7 g/cm^3
Crystal System: Trigonal
Uses: Rhodochrosite is an ore of manganese. It may also be carved into ornaments or figures, and is also used in jewelry.

Other Interesting Facts: The name rhodochrosite came from the two Greek words meaning rose and coloring referring to its color.

RHODONITE

$(Mn,Fe,Mg,Ca)SiO_3$



Color: Red, Pink, Brownish-Red, Gray
Hardness: 5½-6½
Cleavage: Perfect
Fracture: Irregular/Uneven, Conchoidal
Luster: Vitreous
Streak: White
Specific Gravity: 3.726 g/cm^3
Crystal System: Triclinic
Uses: Rhodonite is used in jewelry and is a minor ore of manganese.

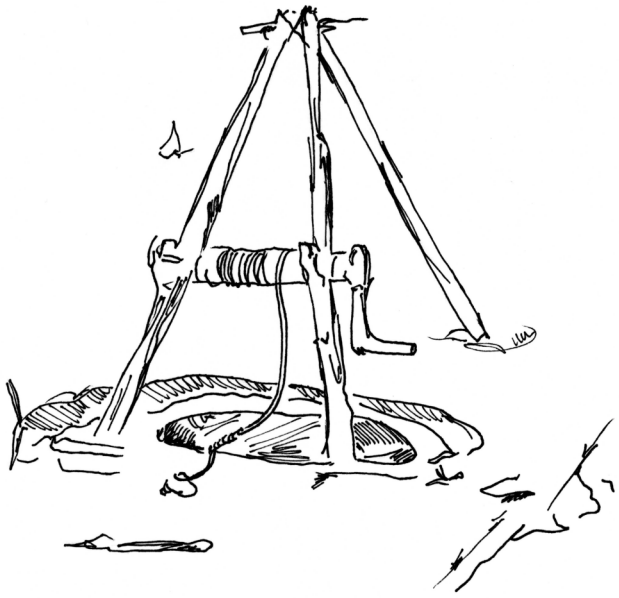
Other Interesting Facts: Rhodonite's name came from the Greek word that means rose, referring to its color.

SILVER

Ag

Color: Silver-White, tarnishes Dark Gray to Black
Hardness: 2½-3
Cleavage: None observed
Fracture: None observed
Luster: Metallic
Streak: Silver White
Specific Gravity: 10.497 g/cm^3
Crystal System: Isometric
Uses: Silver is used in many different ways including in electronics, solar panels, nuclear energy, jewelry, silverware, medicine, coins, and in photography.
Other Interesting Facts: The name silver came from Old English *seolfor,* with the original meaning lost. The chemical element abbreviation Ag comes from the Latin word *argentums,* meaning silver.

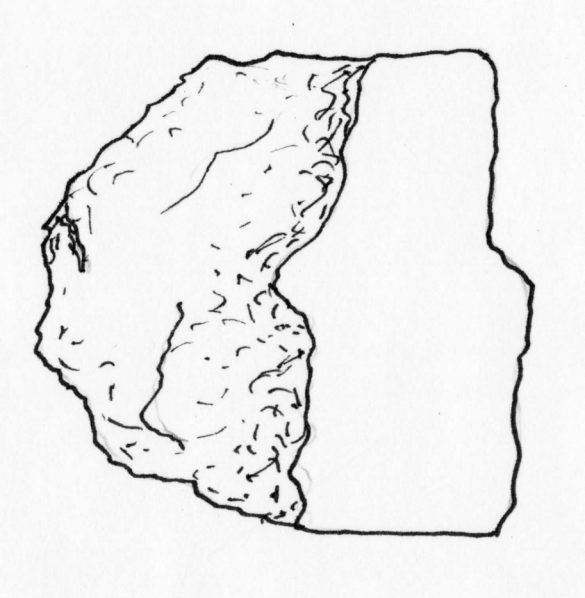
William C. Farlin mined the first silver in the Butte area staking his claim on New Year's Eve 1874. Originally, the claim was named the Asteroid. William Clark owned the Travona after Farlin. In 1879, this claim became known as the Travona.



The copper king Marcus Daly arrived in Butte in 1876 to mine the Alice silver mine. It was owned by the Walker Brothers of Salt Lake City, UT. Daly discovered that there was a large amount of copper in the silver ore. This would be the start of the high demand for copper because it was cheaper than silver and a better conductor of electricity.

SPHALERITE

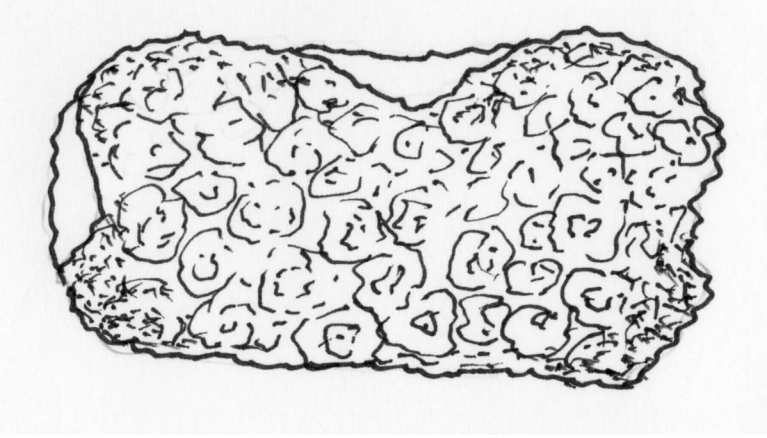
ZnS



Color: Yellow, Light to Dark Brown, Black, Red Brown, Colorless, Light Blue, Green
Hardness: 3½-4
Cleavage: Perfect
Fracture: Conchoidal
Luster: Adamantine
Streak: Pale Yellow to Brown
Specific Gravity: 4.096 g/cm^3
Crystal System: Isometric
Uses: Primary ore of zinc.
Other Interesting Facts: Sphalerite's name is derived from the Greek word *sphaleros* meaning treacherous.

TENNANTITE

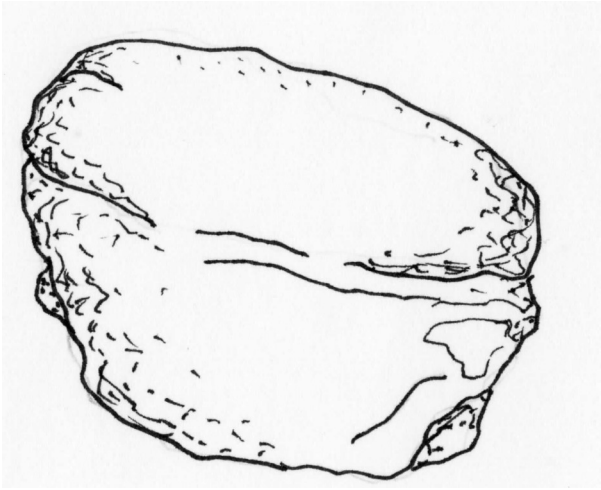
$(Cu,Fe)_{12}As_4S_{13}$



Color: Black to Steel Gray
Hardness: 3-4
Cleavage: None Observed
Fracture: Subconchoidal
Luster: Metallic
Streak: Black to Reddish if rubbed
Specific Gravity: 4.6 g/cm^3
Crystal System: Isometric
Uses: Tennantite is an ore of copper and a minor ore of silver and arsenic.
Other Interesting Facts: Found in 1819, tennantite was named after Smithson Tennant (1761-1815), an English chemist.

WAVELLITE

$Al_3(PO_4)_2(OH,F)_3 \cdot 5H_2O$



Color: Green, White, Colorless, Yellow, and Brown
Hardness: 3½-4
Cleavage: Good
Fracture: Uneven
Luster: Vitreous
Streak: White
Specific Gravity: 2.3 g/cm^3
Crystal System: Orthohombic
Uses: Wavellite is mined for its aluminum content.
Other Interesting Facts: Wavellite was named in 1805 for William Wavell (1750-1829) who discovered the mineral.

ZINC

Zn

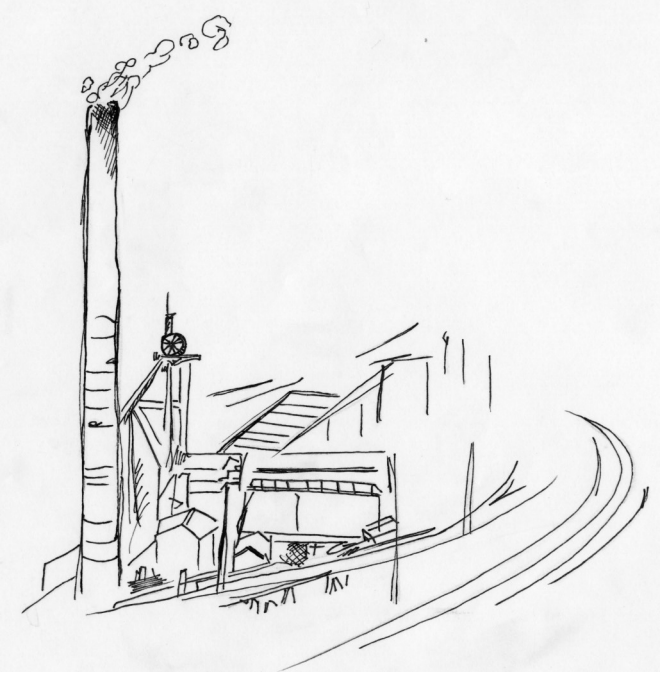
No Speciman Available

Color: White to Blue Gray.
Hardness: 2
Cleavage: Perfect
Fracture: Hackly
Luster: Metallic
Streak: Slightly Grayish
Specific Gravity: 6.9- 7.2 g/cm^3
Crystal System: Hexagonal

Uses: Zinc is used in a variety of special alloys including brass, bronze, nickel silver, soft solder, spring brass, and aluminum solder. We also consume zinc for proper growth and development.
Other Interesting Facts: The name zinc is from the German words *zink*, *zinken* and *zincum* meaning tooth-like, pointed or jagged.

Butte Mineral Word Search

M	Q	H	A	I	Z	O	R	M	S	R	H	O	D	O	N	I	T	E	D	J	E	R	X	L
N	I	O	C	V	D	S	E	A	M	F	Y	L	G	D	X	M	G	R	I	O	T	X	E	P
D	B	D	L	R	T	I	T	N	J	X	O	M	R	O	Q	U	A	R	T	Z	I	L	D	T
O	O	W	N	P	M	R	I	G	I	G	Z	M	O	U	L	F	L	O	U	R	S	M	B	E
L	G	O	L	M	K	B	L	A	A	Z	U	R	I	T	E	B	E	S	M	Y	U	V	A	D
O	R	E	P	P	O	C	L	N	M	Y	F	G	D	E	R	X	N	Z	L	P	L	E	R	B
M	F	C	Y	R	E	J	E	E	P	H	C	R	F	T	P	O	A	G	D	Z	O	T	I	X
I	J	R	N	K	C	T	V	S	K	D	M	L	B	D	Y	E	F	H	Z	V	C	E	T	J
T	Q	I	J	V	B	R	O	E	Y	G	U	B	D	O	R	O	P	D	S	I	L	V	E	R
E	T	I	S	O	R	H	C	O	D	O	H	R	C	L	I	K	G	D	Y	O	J	M	R	F
E	X	Z	P	Y	R	N	H	T	R	P	B	M	N	P	T	I	L	N	F	P	K	D	U	Q
V	H	Y	F	S	K	Z	O	I	D	U	Y	F	I	G	E	T	I	C	O	C	L	A	H	C
E	M	Y	H	V	E	S	T	X	G	O	D	R	Z	T	E	S	G	I	S	K	P	E	T	W
G	H	J	M	U	N	E	D	B	Y	L	O	M	F	G	H	X	U	Z	D	L	O	L	D	K



Azurite
Barite
Bornite
Chalcocite
Colusite
Copper
Covellite
Dolomite
Galena
Gold
Lead
Manganese
Molybdenum
Pyrite
Quartz
Rhodochrosite
Silver
Zinc

Mineral Hunt

1. What mineral was first discovered in Butte in 1864? _____

2. What mineral was named after a mine in Butte, MT? _____

3. This headframe can be visited at the World Museum of Mining. _____

4. Name the mineral that is a major ore for lead and silver. _____

5. Which Copper King discovered that copper would be a better alternative than silver? _____

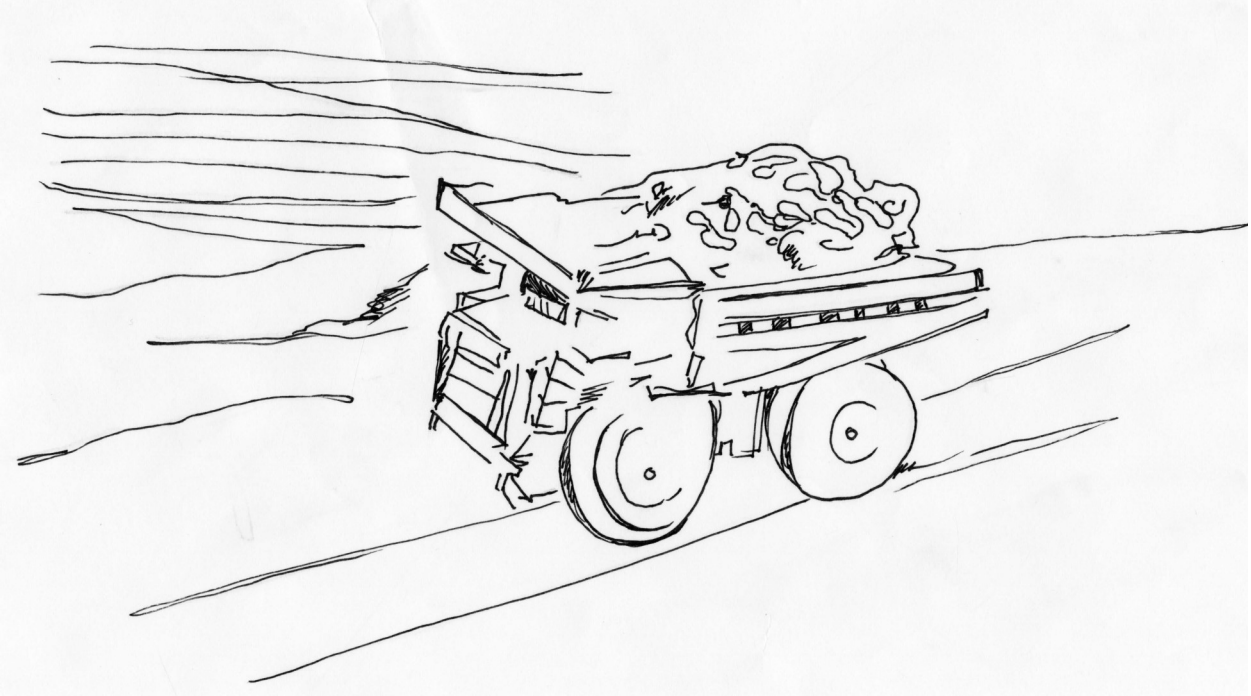
6. Which Copper King once owned the Travona? _____

7. Name the mineral whose name is derived from the Greek words for "rose" and "coloring". _____

8. What mineral do humans consume for proper growth and development? _____

9. Name the alloy created when mixing tin and copper. _____

10. What mineral helps us fight cavities? _____



Existing Headframes

Over 500 headframes once stood in Silver Bow County.

17 remain.

1. **Orphan Girl** (1875-1956) - 3200 feet deep. Produced silver, zinc, and lead. Originally owned by Daly and was eventually operated by the Anaconda Company. The Orphan Girl can be visited at the World Museum of Mining.

2. **Travona** (1874-1954) - 1500 feet deep. Originally named the Asteroid, staked by William L Farlin. Silver reestablished Butte after gold supply dwindled. Mr. Farlin had to take a loan out from the Bank of Clark. When Farlin defaulted on his loan, ownership transferred to William Clark who changed the name to Travona after a province in the Balkin states. Travona was one of the mines that helped Clark get his start in Butte.

3. **Anselmo** (1887-1959) - 4301 feet deep. Produced zinc and copper. The Anselmo is currently owned by Butte Silver-Bow county and is one of the most intact mine yards in Butte.

4. **Lexington** (c.1876-1957) 3260 feet deep. Produced silver and zinc.

5. **Badger State** (1883-1966) 4169 feet deep. Produced copper predominantly.

6. **Granite Mountain** (1887-1944) 3700 feet deep. The Speculator fire of 1917 began in one of the shafts of the Granite Mountain. 168 men lost their lives in this fire which marked this disaster as one of the most deadly hard rock mining events in the United States.

7. **Bell-Diamond** (1882-1928) 3500 feet deep. Originally owned by William Clark who eventually sold the Bell-Diamond to the Anaconda Company. This is one of the oldest headframes left standing.

8. **Mountain Con** (c.1886-1974) 5380 feet deep. Produced mostly copper. The Mountain Con mine is the deepest in Butte and gave Butte the phrase, "Mile High, Mile Deep".

9. **Steward** (1885-1971) 4600 feet deep. Produced silver and copper and was originally owned by William Clark.

10. **Original** (1878-1940) 3900 feet deep.

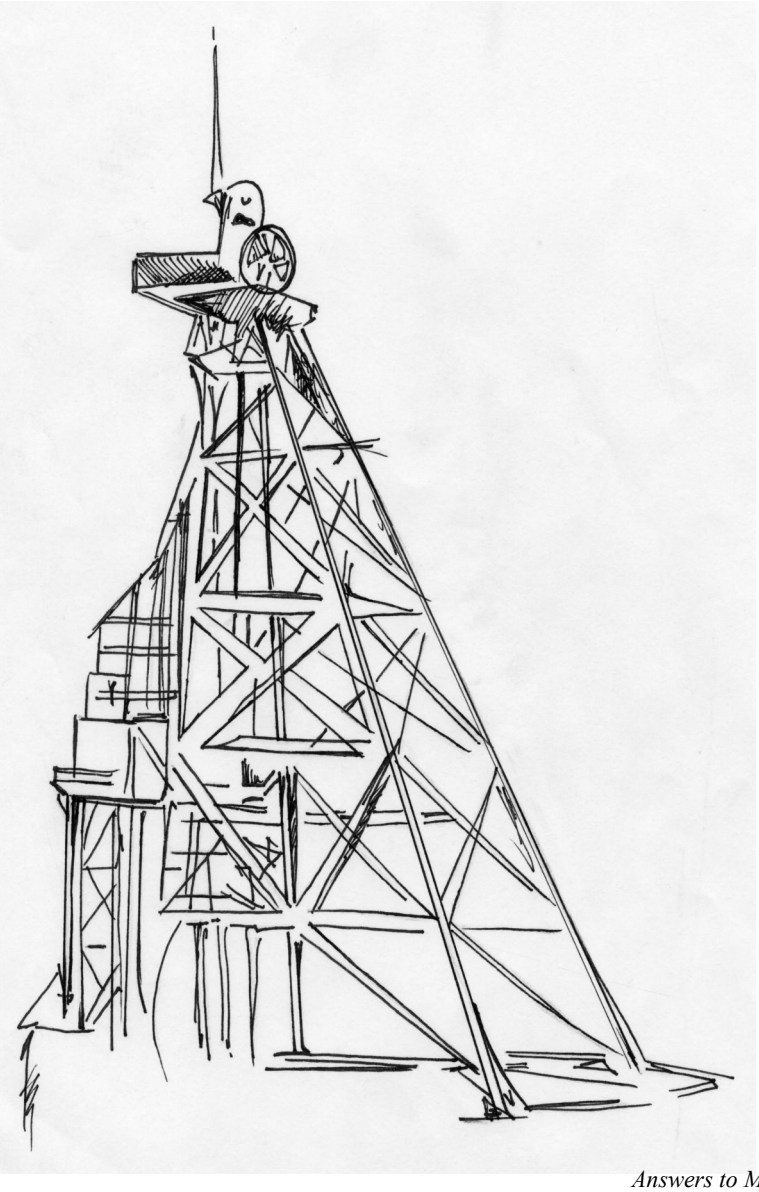
11 **Belmont** (1900-1956) 4300 feet deep. Produced copper. Temporarily closed in 1956 due to declining copper prices. The market for copper never quite recovered in order for the Belmont to resume mining.

12. **Kelley No 1 Mine** (1949-1980) 4810 feet deep. The Kelley No 1 is the youngest and tallest on the hill and was the last mine to close. It was also the first block caving mine in the Butte district.

13. **Kelley No 2** – Service Shaft Tramway to the Kelly.

14. **Pilot Butte** – Production mine that was converted to an air shaft for the Badger Mine.

15. **Parrot One** – In 1876, 160 feet deep. Produced copper. Discovered by Dennis Leary in 1864 making it one of the first in Butte, and was named after a lawyer. The steel headframe was moved to the Neversweat Mine and replaced with a wooden one which still exists at the Parrot site.



16. **Modoc** Burned two weeks before the Speculator became an airshaft and was part of the Mountain Consolidated Group.

17. **Parnell** Wooden headframe still stands. The Parnell was a major ore producer until the 1920s. Then it became an air shaft for the Mountain View.

Answers to Mineral Hunt:
1. Gold; 2. Colusite; 3. Orphan Girl; 4. Galena; 5. Marcus Daly; 6. William Clark; 7. Rhodochrosite; 8. Zinc; 9. Bronze; 10. Fluorite

Thank you to the following for their contributions
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Mineral Museum
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