

OCCURRENCES

The map showing the numbered selenium occurrences is plate 18, on page 47 in volume 2.

FERRY COUNTY

Blaine Republic
(see Republic under gold)

Flag Hill (2)
(see under gold)

Golden Valley
(see Valley under gold)

Lamefoot
(see Valley under gold)

Republic (3)
(see under gold)

Valley (1)
(see under gold)

SILICON

Properties—Although silicon is ordinarily classified as a nonmetallic element, it does possess some metallic properties, and the pure element is commonly called "silicon metal." Massive silicon is crystalline, lustrous, gray black, and metallic appearing. It is brittle and is harder than glass. It is classified as a semi-conductor; that is, it has only slight conductivity for electricity. Silicon has poor mechanical properties, thus it presents a challenge to metallurgists to adapt it to structural uses in order to utilize such desirable characteristics as light weight (lighter than aluminum), corrosion resistance, high melting point, and ease of production. Silicon is almost inert chemically at low temperatures but is active when heated. It closely resembles carbon in its chemical properties and always displays a valence of 4. Other properties are shown in the table on page 12.

Uses—The use of silicon, mostly in the form of ferrosilicon, in making steel is of utmost importance, silicon being used in about 90 percent of the steel made in this country. Normally, just enough silicon is added to each melt to act as a deoxidizer and degasifier, but sometimes enough is added to make silicon-steel alloys, the latter use accounting for about 10 percent of the silicon consumed in this country. Silicon also is used as a scavenger and as an alloy constituent with copper and aluminum alloys. Silicon is used as a heat- and corrosion-resistant coating on other metals, and the pure material is used in transistors, rectifiers, and other electrical equipment. Silicon compounds have many important industrial uses, but few, if any, of these compounds are made from metallic silicon.

Production—In Washington ferrosilicon is produced in electric furnaces at three plants, those of the Keokuk Electro-Metals Co. at Rock Island, the Ohio Ferro-Alloys Co. at Tacoma, and the Pacific Northwest Alloys, Inc. at Mead. Of these, the first two have produced metallic silicon also.

Prices—Silicon of 97 percent purity sold at 20 cents per pound in 1951; in August 1952 the price dropped to 18½ cents, and was still at that figure 3 years later. One pound of extremely pure silicon for electrical use was imported in 1950, and the quoted value was \$517 per pound. Material of similar purity was quoted at \$430 per pound in 1952.

Ore minerals and geology—After oxygen, silicon is the most abundant element and makes up nearly 28 percent of the earth's crust. With the exception of the carbonates, all the common rocks of the earth's crust are siliceous. Although the element is very abundant, it never occurs free but always in combination in a great variety of minerals, mostly silicates, such as feldspars, amphiboles, pyroxenes, micas, and clays. However, the oxide, quartz is the most abundant of all the silicon minerals, and it is the only mineral which serves as an ore of silicon. In spite of the abundance and widespread distribution of quartz, there are few deposits of the mineral suitable as ore of silicon or ferrosilicon. Ore specifications are hard to meet in that they call for extremely high silica content, low iron, phosphorus, and calcium, and for unusual physical properties.

OCCURRENCES

Occurrences of massive quartz, the principal ore of silicon, are described in Part I of this report. Also in Part I are descriptions of occurrences of quartzite, some

of the most pure of which have been mined for the manufacture of ferrosilicon and which might conceivably be mined as ore of silicon.

SILVER

Properties—Silver is a pure-white metal having a brilliant, perfect metallic luster. It is a little harder than gold, and is exceeded only by gold in ductility and malleability. Polished silver reflects visible light as well as, or better than, other metals, is a good reflector of infrared radiation, but is inferior to aluminum and many other metals as a reflector of ultraviolet light. Silver is the best of the metals as a conductor of heat and electricity. The molten metal in air dissolves 22 times its own volume of

oxygen, which, when the melt cools, escapes with a sputtering sound and a flash of light. Silver is not ordinarily oxidized by air, and resists attack by many chemicals, but it tarnishes readily when contacted by sulfur compounds. The element is univalent. Other properties are shown in the table on page 12.

Uses—Silver has been used since earliest times for coins and ornamental articles, and the largest use is still for monetary purposes. Much of it is simply hoarded,

both by individuals and by governments. In the arts and industries the largest use is for sterling and plated tableware. Photography is using increasing quantities, mostly in the form of silver nitrate. Solid silver and alloys and silver plating are used in jewelry, trophies, and as lining in laboratory equipment and in brewing and food-processing machinery. It is used in electrical equipment (especially for its anti-arcing properties at contact points), for dental and surgical instruments, dental amalgams, medicines, and for coating mirrors. Alloyed with lead, zinc, and tin, it is used as bearing metal, and in other alloys as solder and brazing rods. A lead-silver alloy is used as anodes for production of electrolytic zinc. Some silver compounds are used as catalysts in certain chemical industries, and other silver chemicals are used to convert sea water to drinking water. During wartime shortages of copper and aluminum, large quantities of silver were used temporarily for electrical conductors.

Production—In Washington, silver production in most years is outranked by that of gold, copper, lead, and zinc. Maximum annual production was 721,450 ounces, valued at \$328,070, in 1902. Production in 1950 was 363,656 ounces, valued at \$329,127, and total production through 1952 has been 14,871,542 ounces, valued at \$10,957,311. In total silver production through 1952, Washington ranks tenth among the states. In 1950 no Washington mine was among the 25 largest producers of silver in the country. It has been many years since any large mine in this state has produced silver as its principal value, although at one time several mines in the Nighthawk, Nespelem, and Ruby-Conconully districts of Okanogan County and in the Chewelah and Colville districts of Stevens County were notable silver producers. Silver is a byproduct of nearly all gold mines and most copper, lead, and zinc mines. The Knob Hill mine (gold ore) was the leading silver producer in 1950, followed by the Holden mine (copper-gold-zinc ore), Bonanza mine (lead ore), Gold King mine (gold ore), and Grandview mine (zinc-lead ore). These 5 mines produced 94 percent of the state total of silver in 1950.

Prices—Silver prices in the past 50 years have fluctuated generally with the prices of the base metals. The highest level was \$1.35 per ounce in 1920, but in the same year the price dropped to 65 cents, and the lowest price for silver was 24 cents in 1932. The U. S. Treasury buying price of newly mined domestic silver was set at 71.1 cents in 1939 and changed to 90.5 cents in 1946. The latter price was still in effect in 1955. The New York open-market price for foreign and secondary silver has been from 5 to 20 cents less than the Treasury price.

Ore minerals—Silver occurs native and alloyed with gold, copper, and mercury, and also in at least 55 well-known silver minerals as a sulfide, arsenide, antimonide, telluride, chloride, bromide, and iodide, and as numerous sulfosalts. The commonest ore is silver-bearing galena, and fairly common are silver-bearing pyrite, sphalerite, and minerals of copper and cobalt. Of the copper minerals which carry silver, perhaps the commonest is the silver-rich variety of tetrahedrite known as freibergite. Some of the chief silver minerals are cerargyrite (horn silver), AgCl , containing 75.3 percent silver; argentite, Ag_2S , containing 87.1 percent silver; stephanite, Ag_5SbS_4 , containing 68.5 percent silver; pyrargyrite (ruby silver) Ag_3SbS_3 , containing 59.9 percent silver; and proustite, Ag_3AsS_3 , containing 65.5 percent silver.

Geology—Although silver occurs in some deposits as the principal value, more commonly it accompanies gold, lead, zinc, and copper, and so its origin and type of deposit may be extremely varied. Most of the silver of the world comes from the North American Cordillera, where it is commonly associated with Tertiary intrusive and volcanic rocks such as diorite, monzonite, granodiorite, rhyolite and andesite. Most of the silver is in fissure veins or related deposits of irregular shape, in which the ores have been deposited from solution in open spaces or by replacement. The lodes may be in almost any kind of rock, and the common gangue is quartz, calcite, dolomite, or rhodochrosite.

OCCURRENCES

The maps showing the numbered silver occurrences are plates 19 and 20, on pages 51 and 53 in volume 2.

BENTON COUNTY

Prosser (1)
(see under gold)

CHELAN COUNTY

Allen Magnesium
(see under gold)

Amigo (79)
(see under gold)

April Fool (61)
(see under gold)

Arizona (36)
(see under copper)

Big Chief
(see under lead)

Big Elephant
(see under gold)

Black Warrior (17)
(see under copper)

Black and White (84)
(see under gold)

Blue Jay (29)
(see under copper)

Blue Jay Extension (38)
(see under copper)

Bryan (47)
(see under copper)

Budge (83)
(see under gold)

- Buster (22)**
(see under gold)
- Butte**
(see under copper)
- Caledonia (62)**
(see under gold)
- Canada (30)**
(see under copper)
- Cascade Consolidated (11)**
Loc: Sec. 31, (35-15E), Horseshoe Basin area. **Owner:** Cascade Consolidated Mining & Smelting Co. (1934). **Ore:** Silver, lead, zinc, gold. **Ref:** 67, p. 39. 114, no. 5, 1909. 119, no. 3, 1912, p. 7. 158.
- Charlotte (86)**
(see under gold)
- Chub (26)**
Loc: Sec. 2, (31-18E), on both sides of Meadow Cr. **Access:** About 1 mi. of trail from mouth of Meadow Cr. **Prop:** 1 claim. **Owner:** M. M. Kingman and R. N. Pershall (1897). **Ore:** Silver, gold. **Ore min:** Sulfides. **Dev:** 30-ft. shaft. **Assays:** \$14 Au, \$18 Ag. **Ref:** 63, p. 81. 67, p. 31.
- Clagstone (4)**
(see under lead)
- Copper King**
(see Pickwick under copper)
- Crown Prince and Free Coinage**
(see under copper)
- Culver (68)**
(see under gold)
- Daisy Dean (74)**
(see under gold)
- Davenport (7)**
(see under copper)
- Defender (3)**
(see under copper)
- Diamond Dick**
(see Black and White under gold)
- Dominion**
(see Union and Dominion under gold)
- Donaldson (63)**
(see under gold)
- Doubtful (13)**
(see under lead)
- Drummer Boy (51)**
(see under gold)
- Elephant (35)**
Loc: NW¼ sec. 7, (31-19E), on S. side of Cascade Cr., Meadow Cr. dist. **Prop:** 2 claims. **Owner:** J. M. Scheuycaille (1897). **Ore:** Silver. **Assays:** As high as 50 oz. Ag. **Ref:** 63, p. 81. 67, p. 32.
- Ellen**
(see Van Epps under antimony)
- Emma Lee**
(see under gold)
- Esmeralda**
(see under gold)
- Excelsior**
(see Nevada and Excelsior under gold)
- Falls (14)**
(see under lead)
- Flamingo (20)**
(see under copper)
- Flora**
(see Lake and Flora under gold)
- Francis L.**
(see Golden Guinea under gold)
- Franklin (10)**
(see under lead)
- Free Coinage**
(see Crown Prince and Free Coinage under copper)
- Galena (8)**
(see under lead)
- Gem (82)**
(see under gold)
- Gem (39)**
(see under copper)
- Gold King**
(see Golden King under gold)
- Gold Knob (85)**
(see under gold)
- Golden Guinea (75)**
(see under gold)
- Golden King (87)**
(see under gold)
- Gordon (80)**
(see under gold)
- Grace (31)**
(see under copper)
- Gray Eagle**
Loc: At head of Bridge Cr., Stehekin dist. **Owner:** Messrs. Rogers and Howe, Waterville, Wash., and Oscar Johnson and Peter Dalberg (1897). **Ore:** Silver, gold. **Assays:** 140 oz. Ag, \$4 Au. **Ref:** 63, p. 84. 67, p. 40.
- Great Republic**
(see under lead)
- Hidden Treasure (53)**
(see under gold)
- Holden (44)**
(see under copper)
- Homestake (64)**
(see under gold)
- Homestake and Star (18)**
Loc: Sec. 5, (34-15E), across the canyon from the Isoletta mine, Horseshoe Basin area. **Owner:** R. N. Pershall, M. M. Kingman, and Charles Johnson (1897). **Ore:** Silver, gold. **Deposit:** Ore body 4 ft. wide. **Dev:** 30-ft. open cut. **Assays:** 112 to 400 oz. Ag, \$15 Au. **Ref:** 63, p. 83. 67, p. 40.
- Horseshoe Basin (6)**
(see under lead)
- Howe Sound**
(see Holden under copper)
- Humbug**
(see under lead)

Hummingbird (69)

(see under gold)

Hunter (41)

Loc: SW¼ sec. 12, (31-18E), on shore of Lk. Chelan just N. of mouth of Cascade Cr. **Prop:** 2 claims. **Owner:** D. H. Lord and A. W. Chapelle (1897). **Ore:** Silver, gold, copper. **Ore min:** Pyrrargyrite, tetrahedrite. **Deposit:** 4-in. paystreak. **Dev:** 15-ft. adit. **Assays:** 140 oz. Ag, \$16 Au. **Ref:** 63, p. 82. 67, p. 32.

Idaho (32)

(see under copper)

Indiana

(see under lead)

Iowa (37)

(see under gold)

Irene

(see Holden under copper)

Isoletta (19)

Loc: Sec. 5, (34-15E), Stehekin dist. **Owner:** J. D. and R. N. Pershall, C. C. May, and Mrs. Hess (1897). **Ore:** Silver, gold. **Dev:** 215-ft. adit. **Assays:** 300 to 700 oz. Ag, \$3 to \$7 Au. **Prod:** 2,200 lb. shipped returned \$60 per ton. **Ref:** 63, p. 83. 67, p. 38.

Ivanhoe

(see Wilder under gold)

Keefer Brothers

(see under molybdenum)

King Solomon (23)

(see under copper)

King Solomon (Pickwick)

(see Pickwick under copper)

King Solomon (Van Epps)

(see Van Epps under antimony)

Kingman

(see Galena under lead)

Lake and Flora

(see under gold)

Lake Shyall (21)

(see under copper)

Leo

(see under copper)

Little Jap (27)

Loc: NW¼SE¼ sec. 3, (31-18E), on shore of Lk. Chelan about 500 ft. SW. of Sunday Morning property, Meadow Cr. dist. **Elev:** 1,080 to 1,280 ft. **Access:** Boat from town of Chelan. **Prop:** 4 claims. **Owner:** Crooker Perry, Lakeside, Wash. (1947). **Ore:** Silver, copper, gold. **Ore min:** Pyrite, pyrrhotite, and, according to old reports, pyrrargyrite and chalcopyrite. **Deposit:** A 4-in. gouge seam in granite gneiss contains a ½-in. seam of quartz in which is scattered pyrrhotite and pyrite. **Dev:** Main adit below lake level, 30-ft. adit about 200 ft. above the lake. **Ref:** 63, p. 82. 67, p. 33. 158.

Logan (5)

(see under lead)

Lone Rock (65)

(see under gold)

Lottie S.

(see under copper)

Lucky Queen (66)

(see under gold)

Lulu

(see under gold)

Manistee (70)

(see under gold)

Marcus Stein (42)

Loc: NE¼ sec. 17, (31-17E), on Wilson Cr., a tributary to Railroad Cr. **Access:** Road from Lucerne. **Prop:** 2 claims. **Owner:** Marcus Stein (1897). **Ore:** Silver, gold. **Ore min:** Pyrrargyrite, pyrite. **Gangue:** Quartz. **Ref:** 63, p. 82. 67, p. 36.

Marion

(see under gold)

Maryland

(see under lead)

Meadow Creek Strike (33)

(see under copper)

Meridian (77)

(see under gold)

Michigan

(see under lead)

Minneapolis (2)

(see under gold)

Moscow (24)

(see under copper)

Mountain Sheik

(see under copper)

Nebraska (25)

(see under copper)

Nelson

(see Pickwick under copper)

Nevada and Excelsior

(see under gold)

New York (59)

(see under gold)

North Pole (78)

(see under gold)

North Star (71)

(see under gold)

North Star (46)

(see under lead)

Ohio

(see under lead)

Ombompo (12)

(see under gold)

Orphan Boy (40)

Loc: SW¼ sec. 12, (31-18E), at mouth of Cascade Cr., Meadow Cr. dist. **Elev:** 1,160 ft. **Access:** Boat to Cascade Cr. and trail up the creek. **Prop:** 1 claim (formerly included with the Hunter). **Owner:** George La Chapelle, Lakeside, Wash. (1947). **Ore:** Silver, lead, zinc, gold. **Ore min:** Pyrite, pyrrhotite, galena, sphalerite, minor amounts of pyrrargyrite, arsenopyrite. **Gangue:** Quartz, gouge, carbonates. **Deposit:** A 7-ft. zone of hydrothermal alteration contains bands of mineralized quartz as much as 3 in. wide. Horseshoes of wall rock also included in the zone. **Dev:** 50-ft. adit, 10-ft. inclined shaft, open cut. **Improv:** Cabin (1947). **Assays:** 8-in. sample across the hanging wall assayed 4.64 oz. Ag, 0.13% Pb, 0.16% Zn. A 6-ft. sample across the footwall assayed 28.64 oz. Ag, 0.02 oz. Au, 0.11% Zn. **Ref:** 132, pp. 59-62. 158.

- P. I. (52)**
(see under gold)
- Panama No. 2**
(see under lead)
- Pangborn (54)**
(see under gold)
- Phyllis (34)**
(see under copper)
- Pickwick**
(see under gold)
- Pickwick (Copper King) (58)**
(see under copper)
- Prairie Dog**
(see under gold)
- Prince of Wales**
Loc: In Maple Cr. Basin, Stehekin dist. **Owner:** John Ferguson (1897). **Ore:** Silver. **Ref:** 63, p. 84. 67, p. 42.
- Prospect (72)**
(see under gold)
- Quien Sabe (15)**
(see under lead)
- Rainier (76)**
(see under gold)
- Raymond (43)**
Loc: NE $\frac{1}{4}$ sec. 17, (31-17E), on Wilson Cr., adjacent to Marcus Stein claims on the S., Railroad Cr. dist. **Access:** Near road. **Prop:** 1 claim. **Owner:** Seattle Gold Mining & Development Co. (1897). **Ore:** Silver, gold. **Ore min:** Pyrargyrite, pyrite. **Gangue:** Quartz. **Ref:** 63, p. 82. 67, p. 36.
- Red Cap (48)**
(see under gold)
- Red Hill (49)**
(see under gold)
- Red Mountain (50)**
(see under copper)
- Rex (55)**
(see under gold)
- Rogers**
(see Rex under gold)
- Roscoe Conkling**
(see under lead)
- Rouse (16)**
(see under lead)
- Royal**
(see Red Mountain under copper)
- Sailor Boy**
(see under gold)
- Savage**
(see under gold)
- Silver Fiend (57)**
(see under lead)
- Silver Trail (45)**
(see under copper)
- Snook and Ellen**
(see Van Epps under antimony)
- Spokane Boy and Girl**
(see under copper)
- Squillchuck**
(see Golden King under gold)
- Star**
(see Homestake and Star)
- Sunday Morning (28)**
Loc: NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 3, (31-18E), on E. shore of Lk. Chelan, Meadow Cr. dist. **Elev:** 1,080 ft. **Access:** Boat from the town of Chelan. **Prop:** 1 claim. **Owner:** Crooker Perry, Lakeside, Wash. (1947). **Ore:** Silver, lead, gold. **Ore min:** Galena, pyrite, pyrargyrite. **Gangue:** Quartz. **Deposit:** A 4-ft. zone of hydrothermal alteration in granite gneiss contains a $\frac{1}{2}$ - to 2-in. stringer of sparsely mineralized quartz. **Dev:** A 70-ft. adit, under water when the lake is high. **Assays:** A shipment returned \$250 per ton gross. **Prod:** 4,600 lb. were shipped prior to 1897. **Ref:** 63, p. 82. 67, p. 30. 97, 1918, p. 504. 158.
- Texas Jack (9)**
(see under copper)
- Tiger (Galena)**
(see Galena under lead)
- Tiger (1)**
(see under gold)
- Union and Dominion (81)**
(see under gold)
- Van Epps (Snook and Ellen) (56)**
(see under antimony)
- Van Epps Copper**
(see Pickwick under copper)
- Velma (60)**
(see under mercury)
- Venus (67)**
(see under gold)
- Wenatchee**
(see Golden King under gold)
- White Elephant**
(see Wilder under gold)
- White Star**
(see under lead)
- Wilder (73)**
(see under gold)
- CLALLAM COUNTY**
- Deer Park**
(see under copper)
- CLARK COUNTY**
- Silver Star (1)**
(see under copper)
- COWLITZ COUNTY**
- Green Mountain (1)**
(see under gold)
- FERRY COUNTY**
- Ada**
(see Laura S. under lead)
- Addie B (163)**
(see under copper)

- Addison (176)**
(see under copper)
- Admiral (18)**
(see under gold)
- Advance (48)**
(see under gold)
- Advance (Cabin) (106)**
Loc: Near center NW¼ sec. 35, (32-36E), 1 mi. NW. of Covada. **Elev:** 2,390 to 2,560 ft. **Prop:** 9 claims: Rising Sun, Cora, Nellie, White Quartz, Saturday, Cabin, Tamarack, Sunbeam, Silver Spray. **Owner:** Advance Mining Co. (1909-1924). **Ore:** Silver, lead, zinc, copper, gold. **Ore min:** Chalcopyrite, pyrite, galena, pyrrargyrite, native silver, sphalerite, pyrrhotite. **Gangue:** Quartz. **Deposit:** 2- to 3-ft. shear zone in schist in which are mineralized lenticular masses of quartz 1 to 16 in. wide. **Dev:** 849-ft. crosscut, 350-ft. drift, 37-ft. winze on lower level. 200-ft. drift, 40-ft. upraise, 35-ft. winze, 350-ft. crosscut on upper level. **Assays:** 8% Pb, 0.05 to 333 oz. Ag, tr. to 0.93 oz. Au. **Ref:** 7, pp. 193-195. 46, pp. 145-147. 98, 1920-1925. 105, no. 15, 1911, p. 536. 112, 1918, p. 163. 114, no. 5, 1909, p. 74. 122, pp. 163-164. 163, pp. 44-47.
- Algonkian (68)**
Loc: Sec. 24, (32-36E), 2½ mi. NE. of Covada post office. **Prop:** 1 claim. **Owner:** A. M. Anderson (1912). **Ore:** Silver, gold. **Ore min:** Dark, finely divided sulfides. **Deposit:** 6-in. quartz vein in quartzite shows dark bands, apparently due to finely divided sulfides. **Dev:** 8-ft. shaft and open cut. **Assays:** 0.03 to 0.06 oz. Au, 6.25 to 8 oz. Ag. **Ref:** 122, p. 174. 163, pp. 73-74.
- Alpine (25)**
(see under gold)
- Anchor**
Loc: T. 39 N., R. 34 E., Curlew dist. **Owner:** National Lead-Silver Co. (1918). Phoenix Gold and Copper Mining & Milling Co. (1911-1918). **Ore:** Silver, gold, lead. **Assays:** Av. of 22 assays: 3.05% Pb, 42.9 oz. Ag, 0.89 oz. Au. **Ref:** 98, 1918, p. 18; 1922, p. 1660. 116, no. 2, 1911, pp. 40-41.
- Anderson (157)**
(see under lead)
- Anecia (26)**
(see under gold)
- Apex**
(see Big Chief under lead)
- Apollo**
(see California under gold)
- Aurum**
(see Day Mines under gold)
- Belcher (177)**
(see under copper)
- Ben Hur (27)**
(see under gold)
- Big Bug (107)**
Loc: SW¼ sec. 35, (32-36E), ½ mi. W. of Covada. **Prop:** 1 claim. **Owner:** H. G. Parmeter (1912). **Ore:** Silver, gold. **Deposit:** 2 quartz veins in quartzite, one 4 to 6 in. wide, the other 6 to 8 in. wide. **Dev:** 20-ft. shaft, 50-ft. crosscut, 2 open cuts. **Assays:** Av. sample of 4-in vein in crosscut assayed tr. Au, 0.40 oz. Ag. **Ref:** 163, pp. 62-63.
- Big Chief (108)**
(see under lead)
- Big Joker**
(see Messenger under lead)
- Big Lake (64)**
(see under lead)
- Big Silver**
Loc: Covada dist. **Ore:** Silver. **Prod:** 1934-1935. **Ref:** 97, 1935, p. 352; 1936, p. 217.
- Black Hawk (109)**
(see under lead)
- Black Tail (110)**
(see under lead)
- Black Tail (Hope) (28)**
(see under gold)
- Black Thorn (79)**
(see under lead)
- Blaine Republic**
(see Republic under gold)
- Blevins**
(see Meadow Creek under copper)
- Blue Bird (135)**
(see under lead)
- Blue Horse (58)**
Loc: Sec. 6, (35-34E), on Iron Mtn., Republic dist. **Access:** 14 mi. SE. of Republic on Iron Mtn. road. **Prop:** 1 claim. **Ore:** Silver, gold. **Ore min:** Arsenopyrite, galena, pyrite. **Deposit:** Quartz vein roughly following the contact between limestone-lime shale series and diorite. **Prod:** Prior to 1913. 1934. **Ref:** 7, p. 201. 97, 1935, p. 353.
- Blue Jacket (59)**
Loc: Sec. 6, (35-34E), on Iron Mtn., Republic dist. **Access:** 14 mi. SE. of Republic on Iron Mtn. road. **Prop:** 1 claim. **Ore:** Silver, lead, gold. **Ore min:** Arsenopyrite, galena, pyrite. **Deposit:** Quartz vein roughly following the contact between limestone-lime shale series and diorite. **Ref:** 7, p. 201.
- Blue Mountain**
(see Jennie under gold)
- Bodie (29)**
(see under gold)
- Boston and Butte**
(see Butte and Boston under gold)
- Boston & New York (Welcome) (9)**
Loc: Sec. 24, (39-33E), Curlew dist. **Owner:** Boston & New York Mines Co. (1924-1926). **Ore:** Silver, copper, lead. **Prod:** 1916, 1928. **Ref:** 97, 1917, p. 501; 1929, p. 425. 98, 1918-1926. 141, p. 22.
- Brimstone**
(see Paul and Brimstone under gold)
- Buffalo (148)**
Loc: NW¼ sec. 6, (31-37E), 1 mi. E. of Covada. **Prop:** 1 claim. **Owner:** Mr. Thompson (1912). **Ore:** Silver, gold. **Gangue:** Quartz. **Deposit:** 2-ft. vein in schist and quartzite. **Assays:** Av. sample of vein at discovery assayed tr. Au, 0.20 oz. Ag. **Ref:** 163, p. 81.
- Burlington and Delaware (156)**
(see under lead)
- Butte and Boston (49)**
(see under gold)
- Butterfly (111)**
(see under lead)

Byrne (Gold Cord) (164)

Loc: Sec. 30, (30-33E), Keller dist. **Owner:** Silver Creek Mining & Milling Co. (1918-1922). Byrne Mining & Smelting Co. (1907). Silver Creek Mining & Milling Co. (1908). Gold Cord Mining & Milling Co. (1918). **Ore:** Silver, gold. **Ref:** 97, 1907, p. 474. 98, 1918-1925. 114, no. 5, 1909, p. 69. 116, no. 4, 1908, p. 91.

Cabin

(see Advance)

California (182)

(see under copper)

California (Apollo) (57)

(see under gold)

Chance (112)

Loc: Near center W½ sec. 26, (32-36E), on hillside just W. of Covada Lk. **Prop:** 1 claim. **Ore:** Silver, gold. **Ore min:** Pyrite. **Deposit:** 8-in. quartz vein in granodiorite. **Dev:** 22-ft. shaft, 8-ft. shaft. **Assays:** 0.02 oz. Au, 1.60 oz. Ag. **Ref:** 122, p. 164. 163, p. 60.

Cherokee Strip (97)

Loc: SW¼ sec. 31, (32-37E), 1½ mi. E. of Covada. **Prop:** 1 claim. **Owner:** L. G. Curry (1912). **Ore:** Silver, gold. **Deposit:** Vein cutting quartzite. **Dev:** 12-ft. shaft. **Assays:** Av. sample of vein assayed tr. Au, 0.20 oz. Ag. **Ref:** 163, p. 65.

Chief

(see Big Chief under lead)

Chief Barnaby (63)

Loc: Sec. 4, (34-35E) and sec. 35, (35-35E), near head of Chief Barnaby Cr., Covada dist. **Access:** 17 mi. by road from railroad at Kettle Falls. **Prop:** 10 claims and 300 acres of deeded land. **Owner:** Chief Barnaby Mines, Inc., Spokane, Wash. (1943). **Ore:** Silver, lead, zinc. **Ore min:** Sphalerite, galena, pyrite. **Deposit:** A few ore lenses along a persistent fault in argillite, limestone, and granite. **Dev:** 395-ft. adit, 35-ft. shaft. **Assays:** Owner states that a few tons of ore near the portal of the adit showed 205 oz. Ag, 21% Pb. **Ref:** 157. 158.

Clay (171)

(see under copper)

Colorado (113)

(see under lead)

Comstock (2)

(see under copper)

Congress (114)

(see under nickel)

Consolidated Mines and Smelting Co., Ltd.

(see under copper)

Copper Key (12)

(see under copper)

Copper Prince

Loc: Keller dist. **Owner:** Keller Copper Co. (1918). **Ore:** Silver, lead, zinc, copper. **Dev:** 120-ft. upper adit, 80-ft. lower adit. **Assays:** Ore on upper dump: 1.4% Cu, 6 oz. Ag. **Ref:** 112, p. 186.

Cougar (174)

(see under copper)

Cuba

(see Big Lake under lead)

Curlew

(see under lead)

Cyprus

(see under gold)

Dan Patch (69)

Loc: Near center SW¼ sec. 13, (32-36E), 3½ mi. N. of Covada post office. **Prop:** 1 claim. **Owner:** L. G. Curry (1912). Dan Patch Mining Co. (1909). **Ore:** Silver, lead, zinc, gold. **Ore min:** Galena, sphalerite, pyrite. **Deposit:** 3 quartz veins cutting quartzite and slate. One vein 16 in. wide and another 2 to 8 in. wide. **Dev:** 54-ft. adit, 30-ft. shaft, several open cuts. **Assays:** 16-in. vein: 0.04 oz. Au, 10.15 oz. Ag. **Prod:** 1909. **Ref:** 46, p. 133. 122, pp. 174-175. 163, p. 71.

Day Mines

(see under gold)

Delaware

(see Burlington and Delaware under lead)

Dewey (136)

Loc: Sec. 2, (31-36E), 1½ mi. SW. of Covada post office. **Prop:** 1 claim. **Owner:** J. C. Seaman (1912). **Ore:** Silver. **Deposit:** 8-in. vein in quartzite and slate. **Dev:** 25-ft. adit in rock and 100-ft. adit in gravel and sand. **Assays:** Av. sample from 25-ft. adit assayed no Au, tr. Ag. **Ref:** 163, pp. 79-80.

Drummond (115)

(see under lead)

East San Poil (30)

(see under gold)

El Caliph (31)

(see under gold)

Emma

(see Standard and Emma under gold)

Etta (80)

(see under lead)

Eureka

(see Quilp under gold)

Faithful Surprise

(see Morning Star under gold)

Five Hundred (150)

Loc: NW¼ sec. 14, (31-36E), Covada dist. **Ore:** Silver, gold. **Deposit:** 4½-ft. vein of quartz-argillite breccia. **Ref:** 122, p. 176.

Flag Hill (50)

(see under gold)

Florence

Loc: 8 mi. SW. of Inchelium, Covada dist. **Ore:** Silver. **Gangue:** Quartz. **Prod:** 1933. **Ref:** 97, 1935, p. 352.

Galena (66)

(see also Gwin)

Loc: NW¼ sec. 11, (32-36E), Covada dist. **Prop:** 1 claim of the Gwin property. **Owner:** Gwin Mining Co. (1913-1922). **Ore:** Silver, gold, copper, lead. **Ore min:** Galena, pyrite. **Deposit:** 3-ft. quartz vein. **Dev:** 17-ft. shaft, 100-ft. crosscut, 150-ft. crosscut. **Ref:** 98, 1918, p. 1448. 112, p. 181. 122, pp. 173-174. 163, pp. 81-83.

Gold Cord

(see Byrne)

Gold Crown

Loc: Keller dist. **Owner:** Bridge Creek Mining Co. (1907). **Ore:** Silver, lead, copper, gold. **Ref:** 116, no. 6, 1907, p. 32; no. 9, 1907, p. 18; no. 10, 1907, p. 19.

Gold Hill (Lost Mine)

Loc: Keller dist. **Owner:** Columbia Silver Mining Co. (1924-1926). **Ore:** Silver. **Prod:** 1926. **Ref:** 97, 1926, p. 466. 98, 1922-1926.

Gold Twenty (65)

(see under gold)

Golden Cord (178)

(see also Consolidated Mines and Smelting Co., Ltd. under copper)

Loc: SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 36, (30-33E), Keller dist. **Elev:** 2,800 ft. **Access:** 6 mi. from Keller up Silver Cr. road. **Prop:** 3 patented claims: Golden Cord, Black Prince, Silver Gulch. **Owner:** Consolidated Mines and Smelting Co., Ltd. (1937-1951). Golden Cord Mining Co. (1915). Blue Ledge Mining & Milling Co. (1917). Nineteen-Nineteen M. & M. Co. (1919-1922). Silver Copper Mining & Milling Co. (1922-1926). **Ore:** Silver, copper, lead, zinc. **Ore min:** Chalcopyrite, sphalerite, galena, pyrite. **Gangue:** Quartz, epidote, garnet. **Deposit:** Silicified schist cut by porphyry. Ore occurs as pockets and sparse disseminations in small quartz veinlets. **Dev:** 2 adits, one 125 ft. long, another 400 ft. long with a 100-ft. crosscut. **Assays:** Rich ore not found below comparatively shallow depth. Smelter shipments ran 2% to 6.1% Cu, 2.4 to 64.2 oz. Ag. Ore from raise in long adit said to run \$14 per ton. **Prod:** Has produced. **Ref:** 98, 1920-1926. 112, pp. 169, 180, 202. 122, pp. 132-133. 158.

Golden Eagle (19)

(see under gold)

Golden Harvest (56)

(see under gold)

Golden Valley

(see Valley under gold)

Good Ore (77)

Loc: SE $\frac{1}{4}$ sec. 22, (32-36E), 2 $\frac{1}{2}$ mi. NW. of Covada post office. **Prop:** 1 claim. **Owner:** G. E. Terpening (1912). **Ore:** Silver, lead, gold. **Ore min:** Galena, pyrite. **Deposit:** A 6- to 10-in. quartz vein in granodiorite traceable for at least 100 ft. Vein irregularly banded with small amounts of ore minerals. **Dev:** 140-ft. crosscut, 10-ft. shaft, several open cuts and short adits. **Assays:** Assays said to be on samples of the Good Ore show 0.6 to 4.06 oz. Au, 9 to 89 oz. Ag. **Ref:** 122, pp. 158-159. 163, pp. 69-70.

Grandview (132)

(see under lead)

Gray (168)

Loc: Sec. 6, (29-34E). **Access:** 7 mi. from Keller by road. **Prop:** 3 claims. **Owner:** Mr. Gray, Wilbur, Wash. **Ore:** Silver, gold, copper. **Deposit:** Said to be an 8-in. vein exposed for 600 ft. **Dev:** 600-ft. adit, 50-ft. shaft, 72-ft. shaft. **Assays:** Ore said to av. \$8 per ton. **Prod:** Reportedly produced 140 tons of ore prior to 1940. **Ref:** 28, pp. 47-52.

Greasy Run (137)

(see under lead)

Great Eastern (70)

(see under lead)

Great Northern (159)

Loc: Near N. line SE $\frac{1}{4}$ sec. 13, (30-32E), Keller dist. **Ore:** Silver, lead, zinc. **Ore min:** Galena, sphalerite. **Deposit:** 1-ft. quartz vein liberally sprinkled with galena and sphalerite cuts moderately sheared and sericitized granite. **Dev:** Open cuts. **Assays:** Samples from the vein reportedly assay 55 to 170 oz. Ag. **Ref:** 46, p. 155. 122, p. 127.

Great Scott (71)

(see under lead)

Great Western (161)

Loc: Sec. 18, (30-33E), $\frac{1}{4}$ mi. W. of Sanpoil R. **Elev:** 500 ft. above Sanpoil R. **Access:** 4 mi. N. of Keller by road. **Ore:** Silver, molybdenum. **Ore min:** Silver-bearing sulfides, molybdenite. **Deposit:** Ore occurs in small fissures in quartzite near intrusive granite. One vein is 12 to 18 in. wide. A small vein is exposed farther down the hill. **Dev:** Shallow winze and open cut. **Assays:** Samples across the vein in shallow upper workings reportedly assayed 50 oz. Ag. **Ref:** 129, pp. 217-218.

Gwin (Hall Creek) (67)

(see also Galena)

Loc: NW $\frac{1}{4}$ sec. 11, (32-36E). **Elev:** 2,000 ft to 2,300 ft. **Access:** 4 mi. W. from Inchelium on Twin Lakes road, thence $\frac{1}{2}$ mi. N. **Prop:** 10 claims: Gwin, Sunnyside, Homestead, Wizard, Big Pet, Missing Link, Hall Creek, Galena, Iron Cap, B. C. Fraction. **Owner:** Ed Hodson (1943). Gwin Mining Co. (1913-1922). Hall Creek Mining Co. (1913-1926). **Ore:** Silver, copper, gold, lead, tungsten. **Ore min:** Tetrahedrite, pyrite, galena, wolframite, arsenopyrite, tennantite or enargite, malachite, azurite. **Deposit:** Quartz veins up to 4 ft. wide parallel to the bedding in quartzites and argillites. **Dev:** 750-ft. adit, inclined shaft, numerous prospect holes and open cuts. **Assays:** Company records show av. 3% Cu, 27.7 oz. Ag, 0.049 oz. Au. **Prod:** Mostly silver but reportedly some tungsten during first world war. **Ref:** 37, pp. 17-19. 97, 1913, p. 797; 1915, p. 569. 98, 1918-1926. 112, p. 181. 122, pp. 173-174. 163, pp. 81-83.

Hall Creek

(see Gwin)

Handy Andy

Loc: T. 30 N., R. 40 E. **Ore:** Silver. **Ref:** 58, p. 28.

Hawkeye (13)

(see under gold)

High Line

(see under gold)

Hope

(see Black Tail under gold)

I. X. L. (138)

(see under lead)

Iconoclast (183)

(see under copper)

Ida May (32)

(see under gold)

Idora (139)

(see under lead)

Illinois (184)

(see under copper)

Imperator

(see Quilp under gold)

Insurgent (20)

(see under gold)

Iron Creek

(see Shamrock under nickel)

Iron Mask (33)

(see under gold)

Iron Monitor (51)

(see under gold)

Iron Mountain (60)

Loc: Sec. 6, (35-34E), Republic dist. **Ore:** Silver, gold. **Prod:** Amount not known. **Ref:** 58, p. 34.

Ivanhoe (Southern Cross) (149)

Loc: N½NW¼ sec. 6, (31-37E), Covada dist. **Elev:** 1,900 ft. **Owner:** Ivanhoe Mining Co. (1911). Southern Cross Mining Co. (1909). **Ore:** Silver. **Deposit:** 3 quartz veins in limy shale each av. 10 in. wide. **Dev:** 650-ft. crosscut adit. **Assays:** Veins appear to be barren but reported to assay fairly well in silver. **Prod:** Small trial shipment of silver ore in 1911. **Ref:** 97, 1911, p. 786. 122, p. 166.

J. H. E. (72)

(see under lead)

Jaybird (98)

(see under lead)

Jenny (6)

(see under gold)

Jim Blaine Fraction (52)

(see under gold)

Juliet (81)

(see under lead)

Jumper (185)

(see under copper)

Juno (61)

Loc: Sec. 6, (35-34E), on Iron Mtn. **Access:** 14 mi. SE. of Republic on Iron Mtn. road. **Prop:** 1 claim. **Ore:** Silver, lead, gold. **Ore min:** Arsenopyrite, galena, pyrite. **Deposit:** Quartz vein roughly follows the contact between limestone-lime shale series and diorite. **Ref:** 7, p. 201.

Kangaroo (34)

(see under gold)

Kentucky Bell (116)

(see under lead)

Keystone (82)

Loc: Near center E½ sec. 34, (32-36E). **Access:** 3 mi. from Covada up Stray Dog Canyon road. **Prop:** 1 claim of the 8-claim Keystone group. **Owner:** G. A. Mathews (1912). Keystone Mining Co. (1909-1915). **Ore:** Lead, silver, gold, copper, zinc. **Ore min:** Galena, sphalerite, chalcopryrite, pyrite, native silver, pyrargyrite. **Gangue:** Quartz, calcite, gouge. **Deposit:** Shear zone in schist and carbonaceous shale. Zone 2 to 6 ft. wide. Breccia mineralized with pyrite, also mineralized quartz veinlets 1 to 4 in. wide. **Dev:** 550-ft. adit. **Assays:** Some veinlets said to carry as much as 4 oz. Au and 190 oz. Ag. **Ref:** 7, p. 195. 46, pp. 126-127. 122, p. 158. 163, p. 70.

King Richard

(see Meadow Creek under copper)

King Solomon (140)

(see under lead)

Knob Hill (35)

(see under gold)

La Fleur

(see Comstock, Walla Walla under copper)

Lakeview Fraction (117)

(see under lead)

Lame Foot (Valley)

(see Valley under gold)

Lamefoot

(see under iron)

Lancaster (7)

(see under copper)

Last Chance (21)

(see under gold)

Last Chance (175)

(see under copper)

Laura S. (133)

(see under lead)

Laurier

(see Talisman under copper)

Little Cove (36)

(see under gold)

Little Jay (118)

(see under lead)

Little Tom

(see Juliet under lead)

Lone Pine (37)

(see under gold)

Lone Star and Washington (1)

(see under copper)

Longstreet (119)

Loc: NE¼NE¼ sec. 36, (32-36E). Adjoins Robert E. Lee on the N. **Elev:** 2,100 to 2,200 ft. **Access:** 5 mi. S. of Inchelium by road. 36 mi. to railroad at Kettle Falls. **Prop:** 2 patented claims: Longstreet, Fidalgo; 4 unpatented claims. **Owner:** H. B. Rosenbaum, Inchelium, Wash. (1943-1949). Henry Garrett (1892-1912). **Ore:** Silver, antimony, lead, zinc, copper, gold. **Ore min:** Pyrite, stibnite, argentite, galena, tetrahedrite, sphalerite, chalcopryrite. **Gangue:** Quartz. **Deposit:** Adjacent to an alaskite dike there is a zone of mineralized silicified granodiorite breccia 8 to 30 ft. wide. Quartz and ore minerals cement the breccia. Stibnite occurs as small streaks and scattered low-grade lenses in breccia zone as much as 150 ft. wide. **Dev:** 400-ft. crosscut adit, 80-ft. adit, and large irregular open cut. **Assays:** One shipment of handpicked ore said to have yielded 25% Sb. Sample from a lens 8 in. wide showed 4.61% Sb, and another lens 4 in. wide showed 19.57% Sb. 3 cars ore reported to have returned 53 to 57 oz. Ag, \$7.00 Au per ton. **Prod:** Some small shipments, one of 2,880 lb. yielded 207 oz. Ag. 120 tons ore known production. **Ref:** 7, pp. 195-196. 97, 1920, p. 267. 105, 5/09, p. 647. 122, pp. 167-168. 129, p. 220. 132, pp. 68-71. 141, p. 50. 157. 158. 163, pp. 34, 67.

Lost Mine

(see Gold Hill)

Lucile Dreyfus

(see Morning Star under gold)

Lucky Boy

(see under lead)

McJunkin (152)

Loc: Near center NE¼ sec. 27, (32-33E), 1½ mi. NW. of Congress property, Keller dist. **Elev:** 3,500 ft. **Owner:** J. H. McJunkin (1913). **Ore:** Silver, lead, zinc, nickel. **Ore min:** Sphalerite, galena, pyrite, nickel carbonate or silicate. **Gangue:** Quartz, calcite, breccia. **Deposit:** 4-ft. mineralized breccia zone separating porphyry from limestone and serpentine. Breccia replaced in part by ore minerals. **Dev:** 45-ft. adit from which a 15-ft. crosscut has been driven. **Assays:** One of the larger bunches of ore from the breccia zone assayed 23.36 oz. Ag, 7.7% Pb, and contained considerable Zn. **Ref:** 46, p. 152. 122, pp. 136-137.

Mable T. (153)

(see under lead)

Malachite (179)

Loc: Sec. 35, (30-33E), on slope N. of Silver Cr. **Owner:** Inspiration Silver Mining Co. (1930). **Ore:** Silver, copper. **Ore min:** Malachite. **Deposit:** Small mass of schistose argillite stained green with copper carbonate said to contain pockets of oxidized ore rich in silver to depths of 30 ft. **Dev:** 2 adits failed to strike ore. **Ref:** 105, 1/23/04, p. 70. 106, 4/3/30. 122, pp. 133-134.

Mammoth (22)

(see under gold)

Manila (173)

(see under copper)

Mayflower (141)

(see under lead)

Meadow Creek (172)

(see under copper)

Messenger (120)

(see under lead)

Meteor (83)

Loc: Near SW. cor. sec. 33, (32-36E). **Elev:** 2,900 to 3,100 ft. **Access:** 3 mi. S. of Meteor by road. **Prop:** 4 patented claims: Peoria, Ohio Fraction, Meteor, Comet. **Owner:** W. D. Chamberlain, Spokane, Wash. (1949). Meteor Mining Co. (1909-1918). **Ore:** Silver, lead, gold, copper, zinc. **Ore min:** Pyrite, galena, sphalerite, rhodochrosite, chalcopyrite, cerargyrite, pyrargyrite, arsenopyrite, argentite, tetrahedrite, native silver. **Gangue:** Quartz, gouge. **Deposit:** Quartz vein from 1 in. to 1½ ft. wide in a shear zone in metamorphic rocks. **Dev:** 160-ft. inclined shaft, 700-ft. crosscut from which a 125-ft. drift has been driven. **Assays:** Smelter certificates on ore shipped show 0.6% Pb, 0.06 oz. Au, 65.84 oz. Ag per ton on 17-ton lot. **Prod:** 20 tons of ore with total gross value of \$1,000 by 1918. **Ref:** 7, pp. 191-193. 46, pp. 139-141. 112, p. 191. 114, no. 5, 1909, p. 72. 122, pp. 155-156. 129, p. 220. 158. 163, p. 84.

Midnight

Loc: Keller dist. **Owner:** Bridge Creek Mining Co. (1907). **Ore:** Silver, lead, copper, gold. **Ref:** 116, no. 6, 1907, p. 32; no. 9, 1907, p. 18; no. 10, 1907, p. 19.

Mineral Hill

(see Morning Star under gold)

Mono (160)

(see under zinc)

Montana (84)

Loc: Near center sec. 28, (32-36E), 3 mi. NW. of Covada. **Prop:** 1 claim. **Owner:** J. P. Reed, Inchelium, Wash. (1941). **Ore:** Silver, lead, zinc, gold. **Ore min:** Galena, sphalerite, pyrite, pyrargyrite. **Gangue:** Quartz, calcite. **Deposit:** Mineralized quartz vein at least 1 ft. wide in granodiorite. **Dev:** 3 shafts said to range from 20 to 90 ft. **Assays:** Samples said to assay as much as 0.16 oz. Au, 224.8 oz. Ag, 47.6% Pb. **Prod:** Has produced. **Ref:** 46, p. 125. 97, 1919, p. 492. 104, 5/30/37, p. 29. 122, p. 157. 158. 163, p. 76.

Morning

(see under gold)

Morning Glory (38)

(see under gold)

Morning Star (4)

(see under gold)

Mount Tolman (165)

(see under copper)

Mountain Lion (39)

(see under gold)

Muldoon

(see under gold)

New York (85)

(see under lead)

North San Poil Fraction (40)

(see under gold)

Northern Light (99)

Loc: SE¼ sec. 31, (32-37E), 1¼ mi. E. of Covada. **Prop:** 1 claim. **Ore:** Silver, gold. **Gangue:** Quartz. **Deposit:** Sheared silicified argillite traversed by many small veinlets of crushed iron-stained quartz. **Dev:** 38-ft. adit, 10-ft. shaft. **Assays:** Av. sample assayed tr. Au, 0.20 oz. Ag. **Ref:** 122, p. 167. 163, pp. 65-66.

Number Seven

Loc: Keller dist. **Ore:** Silver, lead, copper, gold. **Ref:** 116, no. 6, 1907, p. 32; no. 9, 1907, p. 18; no. 10, 1907, p. 19.

Ohio (121)

(see under lead)

Old Gold

(see Morning Glory under gold)

Old Nell (122)

(see under antimony)

Oom Paul (86)

(see under lead)

Ophir (162)

(see under lead)

Oregon (154)

Loc: SW¼ sec. 1, (31-34E), Keller dist. **Ore:** Silver, lead. **Ref:** 114, no. 5, 1909, p. 69.

Oregon

(see Illinois under copper)

Orion (100)

Loc: Just W. of the center of sec. 31, (32-37E), Covada dist. **Access:** ½ mi. W. of road by which it is 28 mi. to railroad at Kettle Falls. **Prop:** 8 claims. **Owner:** F. V. Messenger, Inchelium, Wash. (1941). Orion Mining Co. (1909). **Ore:** Silver, gold, tungsten. **Ore min:** Pyrite, scheelite. **Deposit:** A number of quartz veins from a fraction of an inch to 4 ft. cut sheared slates and argillites. **Dev:** 2 adits, one 500 ft. and the other 1,200 ft. long. Shorter adit is caved. **Assays:** Scheelite less than 1%. **Ref:** 37, p. 21. 114, no. 5, 1909, p. 74. 122, pp. 166-167. 158.

Pacific Mutual

(see Addison under copper)

Panama (8)

(see under gold)

Patterson

(see Jennie under gold)

Paul and Brimstone

(see under gold)

Pearl (41)

(see under gold)

Perry (123)

(see under gold)

Pilgrim (142)

(see under lead)

Pin Money (14)

(see under gold)

Plymouth Rock (143)

(see under lead)

Polaris (124)

(see under lead)

Polepick (186)

(see under copper)

Poor Man's Hope (181)

(see under lead)

Porcupine**Loc:** Republic dist. **Ore:** Silver. **Prod:** 1934. **Ref:** 97, 1935, p. 353.**Prince Henry (151)****Loc:** NW¼ sec. 14, (31-36E). **Ore:** Silver. **Gangue:** Quartz. **Deposit:** 4-ft. vein of crushed iron-stained quartz enclosed by granodiorite. **Ref:** 122, p. 176.**Princess Maude (53)**

(see under gold)

Quilp (23)

(see under gold)

Rattler (73)**Loc:** Sec. 24, (32-36E), Covada dist. **Prop:** 1 claim. **Ore:** Silver, gold. **Deposit:** 3-ft. vein of crushed quartz in quartzite. **Dev:** 95-ft. adit. **Assays:** Av. sample assayed tr. Au, 0.20 oz. Ag. **Ref:** 122, p. 172. 163, p. 73.**Rattlesnake (101)**

(see under lead)

Rebate (15)

(see under gold)

Red Chief (95)

(see under lead)

Reliance (125)**Loc:** Near SE. cor. sec. 35, (32-36E), just N. of Greasy Run prospect, Covada dist. **Prop:** 1 claim. **Ore:** Silver, gold. **Deposit:** 8-in. quartz vein in schistose quartzite near granodiorite contact. **Dev:** Shaft. **Assays:** Av. sample from discovery shaft assayed tr. Au, 0.20 oz. Ag. **Ref:** 122, p. 164. 163, p. 61.**Ren Rice (74)**

(see under lead)

Republic (54)

(see under gold)

Reserve (96)**Loc:** SE¼ sec. 32, (32-36E), 3 mi. W. of Covada post office. **Prop:** 1 claim. **Owner:** L. G. Curry (1912). **Ore:** Silver, lead, gold. **Ore min:** Galena, pyrite. **Gangue:** Quartz. **Deposit:** Vein consists of 7 ft. of crushed quartzite and 3 ft. of white quartz containing galena and pyrite. **Dev:** 48-ft. shaft with 75-ft. drift at bottom. **Assays:** Av. sample from shaft assayed 0.04 oz. Au, 7.80 oz. Ag. **Ref:** 122, p. 156. 158. 163, pp. 75-76.**Robert E. Lee (126)**

(see under antimony)

Romulus (87)

(see under lead)

Rosario (102)

(see under gold)

Rover Bonanza (166)**Loc:** Near center NE¼ sec. 30, (30-33E), on narrow ridge separating Jack and Meadow Creeks. **Prop:** Several claims. **Ore:** Silver, gold, lead, zinc. **Ore min:** Sphalerite, galena, pyrite, arsenopyrite. **Deposit:** Numerous small quartz veins in sheared sericitized granite. Most persistent vein is 3 to 18 in. wide. **Dev:** 150-ft. adit, 120-ft. adit, 400-ft. adit, 200-ft. adit, several open cuts. **Assays:** A sample representing a cross section of the persistent vein assayed 0.09 oz. Au, 52.9 oz. Ag. Considerable percentages of lead and zinc also present. **Ref:** 46, pp. 148-149. 122, pp. 123-125.**Royal Ann (127)**

(see under lead)

St. Patrick (88)

(see under lead)

St. Paul (75)**Loc:** Sec. 13, (32-36E), 4 mi. NE. of Covada post office. **Prop:** 1 claim. **Ore:** Silver, gold. **Ore min:** Pyrite. **Deposit:** 1-ft. quartz vein in 5- to 6-ft. shear zone in quartzite. Zone somewhat mineralized with pyrite. **Dev:** 10-ft. shaft, open cut. **Assays:** Av. sample of the quartz vein assayed tr. Au, 0.20 oz. Ag. **Ref:** 122, pp. 174-175. 163, p. 72.**San Poil (42)**

(see under gold)

San Poil Fraction (43)

(see under gold)

San Poil Monitor

(see Meadow Creek under copper)

Schminski (188)

(see under molybdenum)

Seattle (44)

(see under gold)

Several (89)

(see under lead)

Shamrock (158)

(see under nickel)

Shonee

(see under copper)

Silver Bell (103)

(see under lead)

Silver Crown**Loc:** Keller dist. **Owner:** Silver Crown Mining Co. (1909). **Ore:** Silver, gold. **Ref:** 114, no. 5, 1909, p. 71.**Silver Crown No. 2 (144)****Loc:** Near NE. cor. sec. 1, (31-36E), just E. of and parallel to Silver Crown No. 3, Covada dist. **Prop:** 1 claim. **Owner:** Mr. Howe (1912). **Ore:** Silver, gold. **Ore min:** Pyrite, unidentified sulfides. **Deposit:** Quartz vein in schistose quartzite and limy shale, 18 in. wide at surface, 3 ft. wide on 50-ft. level, and wider on 100-ft. level. **Dev:** 112-ft. shaft with drifts on 50- and 100-ft. levels, 125-ft. crosscut, open cuts, pits. **Assays:** 2 samples from 50-ft. level; one assayed 0.06 oz. Au, 14.94 oz. Ag, the other 0.04 oz. Au, 16.10 oz. Ag. **Prod:** 1,935 lb. in 1905 netted \$168. **Ref:** 122, p. 166. 129, p. 220. 163, pp. 34, 57-58.**Silver Crown No. 3 (145)**

(see under lead)

Silver Hill (169)

(see under copper)

Silver King (170)

Loc: Sec. 6, (29-34E), Keller dist. **Ore:** Silver, lead, copper. **Ref:** 114, no. 5, 1909, p. 69.

Silver Leaf (104)

Loc: SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 30, (32-37E), on S. slope of Rattlesnake Mtn., Covada dist. **Elev:** 1,825 ft. **Access:** 6 $\frac{1}{2}$ mi. S. of Inche-
lium by road and trail. **Prop:** 2 unpatented claims: Tungsten Nos. 1 and 2. **Owner:** Hal Hightower, Covada, Wash. (1942-1949). Held-Roberts Mining Co. (1913). **Ore:** Silver, lead, zinc, tungsten, antimony. **Ore min:** Tetrahedrite, pyrite, chalcocopyrite, sphalerite, galena, stibnite, scheelite, malachite, azurite, native silver, ruby silver, jamesonite, wolframite. **Deposit:** Mineralized quartz lenses in a shear zone 50 ft. wide in limestone, schist, and argillite, 100 to 150 ft. from margin of granodiorite stock. **Dev:** 200-ft. adit, 40-ft. shaft, 50-ft. adit, several open cuts. **Assays:** 11 tons of hand-sorted ore yielded 3.6% Pb, 2.2% Zn, 180 oz. Ag. A mill test on 3 tons of ore showed 2 $\frac{1}{8}$ % WO₃. **Prod:** 1911, 1912, 1915, 1916, 1935. Produced small amount of tungsten in 1915. **Ref:** 7, p. 197. 37, pp. 19-21. 46, pp. 117-118. 97, 1911, 1912, 1915, 1916, 1935. 105, 1913, p. 557; 1916, p. 325. 122, pp. 170-171. 129, p. 220. 130, p. 90. 132, pp. 71-74. 158, 163, pp. 34, 80-81.

Silver Pick

Loc: Keller dist. **Owner:** Bridge Creek Mining Co. (1907). **Ore:** Silver, lead, copper, gold. **Ref:** 116, no. 6, 1907, p. 32; no. 9, 1907, p. 18; no. 10, 1907, p. 19.

Silver Queen (134)

(see under lead)

Silver Spar (90)

Loc: NE. cor. sec. 27, (32-36E), nearly 2 mi. N. of Covada post office. **Prop:** 1 claim. **Owner:** G. E. Terpening (1912). **Ore:** Silver (?). **Deposit:** 18-in. vein in granodiorite consists of quartz and calcite. **Dev:** 2 shafts, one 20 ft. deep. **Ref:** 163, p. 69.

Silver Spar (128)

(see under lead)

Silver Tip (62)

Loc: Sec. 6, (35-34E), on Iron Mtn. **Access:** 14 mi. SE. of Republic on Iron Mtn. road. **Prop:** 1 claim. **Owner:** Silver Tip Consolidated Mining & Smelting Co. (1908). **Ore:** Silver, lead, gold. **Ore min:** Pyrite, arsenopyrite, galena. **Deposit:** Quartz vein roughly parallel to limestone-lime shale series and diorite contact. **Ref:** 7, p. 201. 116, no. 4, 1908, p. 91.

Snowstorm (45)

(see under gold)

Snowstorm (White Swan) (91)

(see under lead)

South Penn (16)

(see under gold)

Southern Cross

(see Ivanhoe)

Southern Republic

(see Princess Maude under gold)

Standard and Emma (55)

(see under gold)

Stemwinder

Loc: Covada dist. **Ore:** Silver, lead. **Prod:** 1939. **Ref:** 97, 1940, p. 477. 158.

Stray Dog (92)

Loc: SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 27, (32-36E). **Elev:** 2,250 to 2,360 ft. **Access:** 2 mi. NW. of Covada post office by road. 36 mi. by

road to railroad at Kettle Falls. **Prop:** 2 unpatented claims. **Owner:** Lee Peone, Inche-
lium, Wash. (1941). Stray Dog Mining Co. (1909). **Ore:** Silver, lead, copper, zinc, gold. **Ore min:** Pyrite, chalcocopyrite, sphalerite, galena, tetrahedrite, pyrrargyrite, argentite, arsenopyrite, native silver. **Gangue:** Quartz, calcite, talc. **Deposit:** Sparsely mineralized quartz vein from stringer to 2 ft. wide occupies a shear zone in quartz monzonite porphyry. **Dev:** Lower level: 260-ft. crosscut, 300-ft. drift, 75-ft. winze, 108-ft. upraise. Middle level: 100 ft. of workings. Upper level: 50 ft. of workings. 100-ft shaft on ridge top. **Assays:** One 20-ton lot assayed 0.3 oz. Au, 5 oz. Ag; another 20-ton lot assayed 0.6 oz. Au, 66 oz. Ag. **Prod:** 2 shipments of 20 tons each reported prior to 1910. **Ref:** 7, p. 193. 46, pp. 123-124. 100, vol. 11, 1903, p. 35. 114, no. 5, 1909, p. 74. 122, pp. 159-160. 129, p. 220. 158, 163, pp. 34, 74.

Summit (129)

(see under lead)

Summit (167)

(see under zinc)

Sunset (146)

(see under lead)

Sunshine (130)

Loc: SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 36, (32-36E), a little less than $\frac{1}{2}$ mi. E. of Covada post office. **Prop:** 1 claim. **Ore:** Silver. **Deposit:** 4-ft. quartz vein in granodiorite. 2 ft. of vein matter at another place is exposed. **Dev:** Two 10-ft. shafts and a 10-ft. open cut. **Assays:** Av. sample from discovery showed no Au, tr. Ag. **Ref:** 122, p. 167. 163, pp. 52-53.

Surprise (46)

(see under gold)

Syndicate (93)

(see under lead)

Syracuse (147)

Loc: Sec. 12, (31-36E), 2 mi. SW. of Covada post office. **Prop:** 1 claim. **Ore:** Silver, gold. **Gangue:** Crushed country rock, quartz. **Deposit:** 6-ft. vein in quartzite and slate composed of crushed country rock and quartz. **Dev:** 30-ft. shaft. **Assays:** Av. sample of the vein assayed tr. Au, 0.20 oz. Ag. **Ref:** 163, p. 80.

Talisman (5)

(see under copper)

Tom Thumb (17)

(see under gold)

Trade Dollar (47)

(see under gold)

Truax (78)

(see under gold)

U. S. (155)

(see under lead)

Umatilla (187)

(see under copper)

V Fraction (24)

(see under gold)

Valley (11)

(see under gold)

Veda W.

Loc: Keller dist. **Owner:** Bridge Creek Mining Co. (1907). **Ore:** Silver, lead, copper, gold. **Ref:** 116, no. 6, 1907, p. 32; no. 9, 1907, p. 18; no. 10, 1907, p. 19.

Vesuvius (180)

Loc: Sec. 35, (30-33E), Keller dist. **Owner:** Lew Wilmont (1913). **Ore:** Silver. **Ore min:** Pyrite. **Gangue:** Quartz, altered granite. **Deposit:** Lode 6 ft. wide in granite composed of vein quartz and altered granite contains good-sized bunches of pyrite. **Dev:** 140-ft. adit, 60-ft. inclined shaft. **Ref:** 58, p. 71. 122, p. 134.

Victor (76)

Loc: Sec. 13, (32-36E), 4 mi. NE. of Covada post office. **Prop:** 1 claim, part of Deer Trail property. **Ore:** Silver, gold. **Ore min:** Pyrite. **Deposit:** Vein in quartzite composed of yellowish quartz in a shear zone 5 to 6 ft. wide mineralized with pyrite. **Dev:** 10-ft. adit, 8-ft. shaft, open cuts. **Assays:** Av. sample assayed 0.01 oz. Au, 0.50 oz. Ag. **Ref:** 122, pp. 174-175. 163, p. 72.

Virginia

(see Morning Star under gold)

Walla Walla (La Fleur) (3)

(see under copper)

Washington

(see Lone Star and Washington under copper)

Welcome

(see Boston & New York)

White Horse

Loc: Keller dist. **Owner:** Silver Crown Mining Co. (1909). **Ore:** Silver, gold. **Ref:** 114, no. 5, 1909, p. 71.

White Rose (94)

(see under lead)

White Swan

(see Snowstorm under lead)

White Tail (131)

(see under lead)

Willmot

(see under copper)

Yellowstone (105)

(see under lead)

Zalla M (10)

Loc: W $\frac{1}{2}$ sec. 30, (39-32E), a few hundred yd. E. of the Ferry-Okanogan County boundary line, Sheridan dist. **Elev:** 4,500 to 5,000 ft. **Access:** 13 mi. NW. of Republic by road. **Prop:** 5 patented claims: Zalla M, Fannie Woodard, Kittie Clide, Discovery, Grandview. **Owner:** E. K. Brown, Ellensburg, and A. R. Jordin, Liberty, Wash. (1936). Zalla Mining Co. (1915). **Ore:** Silver, copper, gold. **Ore min:** Chalcopyrite, pyrite. **Gangue:** Quartz, calcite, fluorite. **Deposit:** Well-defined quartz vein 1 to 6 ft. wide filling an irregular fracture in phonolite. Vein sparsely mineralized and low grade except in zone of secondary enrichment from surface to depth of 150 ft. **Dev:** About 1,000 ft. of workings on 2 levels. **Assays:** Smelter certificates on 30-ton lots of hand-sorted ore showed 86 to 118 oz. Ag, 0.17 to 0.25 oz. Au, 1.0% to 1.2% Cu. **Prod:** \$40,000 to 1903, ore from dump shipped in 1935. **Ref:** 58, p. 74. 129, pp. 198-200.

RANT COUNTY**Black-Rosauer (1)**

(probably the same property as Electric City, described under molybdenum)

Loc: Near SW. cor. sec. 14, (28-30E), in floor of Grand Coulee. **Prop:** 4 claims. **Owner:** Black-Rosauer Mines, Inc. (1937). **Ore:** Silver, gold; reportedly bismuth and molybdenum.

Ore min: Pyrite, galena (?), molybdenite. **Deposit:** A 2- to 5-ft. quartz vein along a shear zone in granite. **Dev:** 85-ft. inclined shaft, 30-ft. adit. **Assays:** Said to assay \$13.45 Ag, tr. Au. **Prod:** Small production reported in 1937. **Ref:** 58, p. 8. 158.

Electric City (2)

(see under molybdenum)

Hope No. 1 (3)

Loc: Near SW. cor. sec. 14, (28-30E), in floor of Grand Coulee. **Owner:** Mr. Gibbs (1938). **Ore:** Silver, gold. **Deposit:** A 3-ft. pegmatite dike in which are no visible ore minerals. **Dev:** 30-ft. adit. **Assays:** Said to carry silver and gold. **Ref:** 158.

Silver Queen (4)

Loc: Near SW. cor. sec. 14, (28-30E), in floor of Grand Coulee. **Owner:** Messrs. Lundstrom and Palmer (1938). **Ore:** Silver. **Ore min:** Pyrite. **Deposit:** Quartz vein in granite. **Dev:** 30-ft. adit with 22-ft. shaft at portal. **Assays:** Said to assay \$7 to \$8 Ag. **Ref:** 158.

KING COUNTY**Aces Up (35)**

Loc: SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 30, (25-11E), 4,200 ft. SE. of the Cleopatra mine. **Elev:** 2,500 to 2,800 ft. **Access:** 7 $\frac{1}{2}$ mi. up Miller R. road from the old Stevens Pass highway, thence $\frac{1}{2}$ mi. by trail. **Prop:** One of 23 claims in the Cleopatra group. **Owner:** E. C. Maloney, Skykomish, Wash., leasing to the Cascade Mining Co. (1949—). **Ore:** Silver, lead, copper, zinc, gold. **Ore min:** Pyrite, arsenopyrite, sphalerite, chalcopyrite, argentiferous galena, jamesonite. **Gangue:** Quartz, calcite. **Deposit:** Joints in granodiorite have been mineralized over a width of a few in. to 2 ft. **Dev:** 4 adits, 415 ft., 175 ft., 20 ft., and 300 ft. long. **Assays:** Occasional streaks of ore 6 in. wide carry 20 oz. Ag. **Prod:** 500-lb. shipment to Tacoma smelter. **Ref:** 63, p. 38. 132, pp. 79-83. 133, p. 29. 158.

Anderson (1)

(see under iron)

Annie (49)

(see under copper)

Apex (16)

(see under gold)

Baring

(see Anderson under iron)

Bear Basin (39)

Loc: SE $\frac{1}{4}$ sec. 14, NE $\frac{1}{4}$ sec. 23, SW $\frac{1}{4}$ sec. 13, and NW $\frac{1}{4}$ sec. 24, (25-10E), Buena Vista dist. **Elev:** 4,100 to 5,000 ft. **Access:** Road from Lennox Cr. to Bear Cr. 1 $\frac{1}{2}$ mi. by trail and 29 mi. by road to railroad at North Bend. **Prop:** 25 unpatented claims. **Owner:** Bear Basin Mining Co., Bremerton, Wash. (1952—). Snoqualmie Mining Co. (1933). Cascade Mines, Inc. **Ore:** Silver, lead, zinc, antimony, copper, gold. **Ore min:** Pyrite, arsenopyrite, freibergite, jamesonite, stibnite, andorite, stannite, sphalerite, galena, molybdenite. **Gangue:** Mangandolomite, quartz. **Deposit:** Sericitized and mineralized granodiorite along fault zones. Zones pinch and swell from thin seams to 4 ft. in thickness. **Dev:** 8 adits and a winze totaling 2,165 ft. **Improv:** Bunkhouse, blacksmith shop, and a small powerhouse. Compressor, pelton wheel, 400 ft. of 8-in. pipe, and 3,000 ft. of $\frac{3}{8}$ -in. cable (1947). **Assays:** A 2-ft. channel sample in the 420-ft. adit assayed 0.06 oz. Au, 16.90 oz. Ag, 0.13% Zn. **Ref:** 11-A, pp. 190-202. 132, pp. 83-87. 158.

Bear Creek

(see Robinson under gold)

Belle of Tennessee (18)
(see under gold)

Bergeson (8)
(see under gold)

Black Jack
(see under gold)

Bobtail (36)
(see under copper)

Bondholders Syndicate
(see Apex under gold)

Bridal Veil
(see under gold)

Brooklyn (23)
(see under copper)

Brown Bear (59)
(see under copper)

Carmack (54)
(see under gold)

Cascade
(see Seattle-Cascade)

Cleopatra (40)
Loc: NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 24, (25-10E). **Elev:** 3,850 ft. **Access:** 7 $\frac{1}{2}$ mi. up Miller R. road from the old Stevens Pass highway, thence 1 $\frac{1}{2}$ mi. by trail. **Prop:** 2 claims: Silver Star, Silver Star No. 1. **Owner:** E. C. Maloney, Skykomish, Wash., leasing to Henry Trenk of the Cascade Mining Co. (1949—). **Ore:** Silver, lead, copper, zinc, antimony, gold. **Ore min:** Argentiferous galena, chalcopryrite, tetrahedrite, arsenopyrite, pyrite, dyscrasite (?), jamesonite, sphalerite. **Gangue:** Quartz. **Deposit:** Altered and mineralized zones along joints in granodiorite. Best assays are from 2 zones each about 2 $\frac{1}{2}$ ft. wide. **Dev:** 2,100 ft. of adits, winzes, drifts, crosscuts, and a raise. **Assays:** Max. 581 oz. Ag, \$10 Au. One ore zone 100 ft. long and 2 $\frac{1}{2}$ ft. wide av. 20 oz. Ag. **Prod:** Intermittent prior to 1914. 1938, 1940, 1941. **Ref:** 43, 1898, p. 260. 63, p. 37. 68, p. 7. 97, 1939, p. 490; 1941, p. 473. 114, no. 5, 1909. 130, p. 59. 132, pp. 79-83. 141, p. 50. 147, p. 180. 158. 159, p. 135.

Climax (3)
(see under copper)

Commonwealth (51)
Loc: Sec. 34, (23-11E), Snoqualmie dist., on Snow Lk. trail. **Ore:** Silver, copper, gold. **Deposit:** In granodiorite. **Ref:** 63, p. 42. 158.

Coney Basin (27)
(see under gold)

Copper Bell
(see under gold)

Copper Chief (50)
(see under copper)

Copper Duke (11)
(see under gold)

Copper Plate
(see Seattle-Cascade)

Damon and Pythias (17)
(see under gold)

Dawson (28)
(see under lead)

Devils Canyon (42)
(see under molybdenum)

Dutch Miller (34)
(see under copper)

Eureka (60)
(see under copper)

Eureka
(see under copper)

Favorite Gulch (12)
(see under gold)

Fletcher Webster
(see under gold)

Foss River (33)
(see under copper)

Goat Mountain (44)
(see under lead)

Gold Mountain (9)
Loc: NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 29, (26-11E). **Access:** 1.2 mi. by road from Money Cr.-Miller R. road junction. **Owner:** Weyerhaeuser Timber Co. (1936). **Ore:** Silver, gold, antimony. **Ore min:** Pyrite, argentiferous stibnite, minor amount of chalcopryrite. **Deposit:** Pyritized and kaolinized andesite in which are reportedly 2 well-defined veins. **Dev:** Reportedly a 1,200-ft. adit, a 20-ft. adit, and another adit caved 30 ft. from the portal. **Ref:** 132, pp. 74-75. 158.

Golden Tunnel (5)
(see under copper)

Great Republic (6)
(see under antimony)

Guye (52)
(see under iron)

Happy Thought
(see Great Republic under antimony)

Hawkeye
(see under gold)

Helmke
(see Lucky Day)

Jack Pot (43)
(see under zinc)

John Stevens
(see Una under copper)

Kimball (10)
(see under gold)

King and Kinney (29)
(see under copper)

Kinney
(see King and Kinney under copper)

Last Chance (55)
(see under gold)

Last Chance (24)
(see under gold)

Laura Lindsay
(see under gold)

Lennox (19)
(see under gold)

Le Roi (37)
(see under gold)

Leta (48)
(see under gold)

Lone Star (25)

(see under gold)

Lost Lode (45)

(see under molybdenum)

Lucky Day (Helmke) (26)

Loc: Sec. 5, (25-12E), Foss R. dist. **Prop:** 11 unpatented claims. **Owner:** Lucky Day Mining & Milling Co., Inc., Everett, Wash. (1938). **Ore:** Silver. **Dev:** 200 ft. of adit. **Ref:** 58, p. 41. 158.

Lucky Strike (21)

(see under gold)

Mastodon

Loc: Near head of N. Fk. Snoqualmie R., Buena Vista dist. **Ore:** Silver, gold, copper. **Ref:** 63, p. 43.

May Earhart

(see Robinson under gold)

Metropolitan (38)

(see under gold)

Mona

(see Mono under copper)

Monarch (13)

(see under gold)

Mono (7)

(see under copper)

Monte Carlo (22)

(see under gold)

Mt. Logan

(see Guye under iron)

Mount Phelps (20)

(see under zinc)

Mountain Gem

(see under gold)

Neptune (14)

(see under gold)

Normandie

(see Bergeson under gold)

Ophir (56)

(see under gold)

Paymaster

(see under gold)

Pedro

(see under copper)

Pythias

(see Damon and Pythias under gold)

Quartz Creek (46)

(see under copper)

Rainy (47)

(see under gold)

Robinson (61)

(see under gold)

Romeo

(see under gold)

Salmon Creek (2)

(see under gold)

San Francisco (15)

(see under gold)

Seattle (57)

(see under gold)

Seattle-Cascade (Triple S, Silver Dollar and Copper Plate) (30)

Loc: Center N½ sec. 17, (25-11E), on W. side of Miller R. **Access:** 4 mi. by road from railroad at Berlin. **Prop:** 6 claims. **Owner:** Seattle-Cascade Mining Co. (1908-1909). **Ore:** Silver, lead, zinc, copper, gold. **Ore min:** Sphalerite, galena, pyrite, arsenopyrite, chalcopyrite. **Gangue:** Quartz. **Deposit:** Several shear zones in granodiorite. Best mineralized zone has av. width of 18 in. Ore occurs in bands. Widest band was 8 in. wide. **Dev:** 400-ft. adit, 700 ft. lower an 800-ft. adit with 250-ft. raise. **Assays:** Av. of 4 old assays shows \$15.27 Ag, \$11.31 Pb, \$7.08 Cu, \$2.00 Au. **Prod:** A few carloads of lead ore from upper adit prior to 1900. 1940. **Ref:** 46, pp. 161-162. 97, 1941, p. 473. 105, no. 20, 1909, p. 680. 114, no. 5, 1909, p. 112. 116, no. 6, 1908, p. 158. 147, p. 184. 158.

Silver Dollar and Copper Plate

(see Seattle-Cascade)

Silver Star (41)

Loc: NW¼ sec. 24, (25-10E), Miller R. dist. **Ore:** Silver, gold, lead, zinc, antimony. **Assays:** 5% Sb. **Ref:** 158.

Sockless Jerry

(see Last Chance under gold)

Solomon (53)

(see under gold)

Stemwinder (58)

(see under gold)

Stevens

(see Una under copper)

Summit

(see Guye under iron)

Sunday

Loc: On King Solomon Cr. a little below the Cleopatra Basin, Miller R. dist. **Ore:** Silver, gold, copper. **Ref:** 63, p. 37.

Surprise

(see under copper)

Triple S

(see Seattle-Cascade)

Triune

(see under gold)

Una (31)

(see under copper)

Vandalia

(see under gold)

War Eagle (32)

(see under gold)

Western States Copper

(see Rainy under gold)

Yellow Jacket (4)

(see under gold)

KITSAP COUNTY**Chico (1)**

(see under tin)

Cook-Kitchen

(see Chico under tin)

Kitchen

(see Chico under tin)

KITITAS COUNTY

American Eagle

(see under gold)

Aurora (1)

(see under gold)

Bear Creek Gold**Loc:** Fish Lk. area. **Prop:** 7 claims. **Owner:** Camp Creek Mining Co. (1939). **Ore:** Silver, gold. **Ref:** 158.**Beaver (4)**

(see under gold)

Big Bug

(see under copper)

Big Z

(see Zerwekh under gold)

Blue Bonnet (17)

(see under copper)

Bonanza

(see Dolphin under copper)

Boss

(see under gold)

Boyles (19)

(see under copper)

Brown Bear

(see under gold)

Camp Creek (18)**Loc:** On line between secs. 25 and 26, (23-14E), just N. of Camp Cr. **Elev:** 3,000 to 3,800 ft. **Access:** 20 mi. by road to railroad at Ronald. **Prop:** 4 unpatented claims. **Owner:** Cle Elum River Mining Co., Inc., Seattle, Wash. (1952—). Camp Creek Mining Co., Inc. (1929-1940). Phil Denny, Seattle, Wash. (1951). **Ore:** Gold, silver, lead, zinc. **Ore min:** Pyrite, sphalerite, galena, chalcopryrite. **Deposit:** Narrow quartz veins in greenstone. **Dev:** 40-ft. lower adit, 60-ft. adit, 160-ft. adit. **Assays:** 15 tons shipped to Tacoma smelter assayed 0.14 oz. Au, 42 oz. Ag. Grab samples of ore showed 0.27 oz. Au, 3.1 oz. Ag, 0.23% Pb, 0.28% Zn. **Ref:** 58, p. 12. 157. 158.**Cascade**

(see under gold)

Cascade Mining (13)

(see under copper)

Cedar Creek Placer (25)

(see under gold, placer)

Clarence Jordin (24)

(see under gold)

Cle Elum (5)**Loc:** Near SW. cor. sec. 24, (23-14E), on Hawkins Mtn., Cle Elum dist. **Prop:** 2 claims: Cle Elum, Hawk. **Owner:** Ben Kelly and Judge Boyles (1892). **Ore:** Silver, gold. **Ore min:** Pyrite. **Deposit:** 4-ft. vein. **Dev:** 70-ft. incline. **Assays:** \$55 Ag, \$4 Au. **Ref:** 13, p. 135. 63, p. 64. 146, p. 14.**Dolphin**

(see under copper)

Don Tom

(see under gold)

Durrwachter

(see Mineral Creek under copper)

Epha

(see under gold)

Esther and Louisa (12)**Loc:** NE¼ sec. 26, (23-12E), on E. side of cirque at head of Gold Cr. **Elev:** 5,000 ft. **Access:** About 6 mi. by trail up Gold Cr. from Snoqualmie Pass highway. **Owner:** Esther Gold & Silver Mining Co. (1915). **Ore:** Silver, gold, lead, zinc. **Ore min:** Pyrite, ruby silver, galena, sphalerite. **Deposit:** Vein near a wide granodiorite dike cutting the Keechelus series. Ore constitutes only a small portion of the vein. **Dev:** 2 adits. **Assays:** Best ore shipped reportedly carried 240 oz. Ag, \$10 Au. **Prod:** Produced about \$1,000 in 1896. **Ref:** 63, p. 61. 146, p. 14.**Family**

(see under gold)

Gold Leaf

(see under gold)

Gold Reef

(see under gold)

Golden Fleece (22)

(see under gold)

Golden Stair**Loc:** Fish Lk. area. **Owner:** Cle Elum River Mining Co., Inc., Seattle, Wash. (1952—). Camp Creek Mining Co. (1939). **Ore:** Silver, gold. **Ref:** 158.**Good Luck (14)**

(see under lead)

Granite King (15)**Loc:** Sec. 24, (23-11E), on Gold Cr. **Owner:** Devine Mining Co. (1915). **Ore:** Silver, copper, lead, gold. **Ref:** 58, p. 27. 63, p. 61. 158.**Great Western**

(see under gold)

Grizzly Bear

(see under gold)

Hans Wagner**Loc:** Swauk dist. **Ore:** Silver, gold. **Ref:** 105, 3/07, p. 327.**Huckleberry (11)**

(see under copper)

Ida Elmore (6)

(see under gold)

Iias (20)

(see under copper)

Just In Time

(see under gold)

King Solomon (3)

(see under copper)

Last Chance

(see under gold)

Legal Tender

(see under copper)

Liberty Lode

(see Mineral Creek under copper)

Little York

(see under gold)

Louisa

(see Esther and Louisa)

Lynch

(see Aurora under gold)

Majestic

(see under gold)

Mammoth
(see under gold)

Mary
(see under gold)

Mercer
(see Golden Fleece under gold)

Mildred
(see under copper)

Mineral Creek (16)
(see under copper)

Morning
(see under gold)

Morning Star (7)
(see under copper)

Mountain Whistler
(see under gold)

Navidad
(see under copper)

Paramount
(see Aurora under gold)

Ruby (10)
(see under gold)

Ruby King
(see under gold)

Rushing Water
(see under gold)

Silver Bull
(see under gold)

Silver Creek (2)
(see under gold)

Silver Dump (8)
Loc: Sec. 23, (23-14E), Cle Elum dist. **Ore:** Silver, gold, copper, lead. **Ref:** 58, p. 62. 63, p. 65.

Silver Queen (9)
Loc: Sec. 24, (23-14E), near head of Fortune Cr., Cle Elum dist. **Ore:** Silver, gold. **Ref:** 58, p. 63. 63, p. 63.

Sonny Brown (23)
(see under gold)

T-Bone
(see Golden Fleece under gold)

Thorp
(see under gold)

Tip Top
(see under gold)

Tip Top No. 1
(see under gold)

Topping
(see under gold)

Twin
(see under gold)

Valinia
(see under gold)

War Eagle
(see under gold)

Williams
(see Iias under copper)

Zerwekh (21)
(see under gold)

LEWIS COUNTY

Eagle Peak (1)
(see under copper)

Mineral Creek (2)
(see under zinc)

Waterfall
(see under gold)

LINCOLN COUNTY

Crystal (1)
(see under lead)

Egypt
(see Pitney Butte under molybdenum)

Fouress (2)
(see under zinc)

Pitney Butte (Fouress) (3)
(see Fouress under zinc)

Pitney Butte
(see under molybdenum)

Silver Queen

Loc: Egypt dist. **Owner:** Greenville Blake (1897). **Ore:** Silver, copper, lead. **Dev:** 48-ft. shaft with 65-ft. drift. **Ref:** 63, p. 116.

Spokane Molybdenum
(see Pitney Butte under molybdenum)

United Workman

Loc: Probably in Mill Canyon, about 10 mi. SE. of Pitney Butte and 10 mi. from Davenport. **Prop:** 2 claims. **Owner:** Dr. J. P. Turney, C. L. Young, Davenport, Wash. (1897). **Ore:** Silver, gold. **Dev:** 26-ft shaft. **Ref:** 63, p. 116.

MASON COUNTY

Black and White (1)
(see under copper)

OKANOGAN COUNTY

Abernathy (22)
(see under copper)

Adams
(see Moncosilgo under copper)

Adelia
(see under gold)

Alder (30)
(see under gold)

Allison
(see Okanogan Free Gold under gold)

Alta
(see Chilson under lead)

American Flag (189)
(see under copper)

American Flag (15)
(see under gold)

American Rand

(see Spokane under gold)

Anaconda (106)

(see under gold)

Anchor (Great Metals) (234)

Loc: Center N½ sec. 28, (31-30E), Nespelem dist. **Prop:** 2 claims: Anchor, West End Apache. **Owner:** G. H. Beggs, Nespelem, Wash. (1939). Old Nespelem Mining Co. (1916). Great Metals Mining & Milling Co. (1918-1922). **Ore:** Silver, lead, zinc, gold. **Ore min:** Argentiferous galena, sphalerite, a little chalcopryrite. **Gangue:** Quartz, rhodochrosite. **Deposit:** Mineralized shear zones in coarse granite. Also a barren 6-ft. quartz vein. **Dev:** 2 accessible short adits and several old caved adits and shafts. **Assays:** One assay said to be 0.22 oz. Au, 149.5 oz. Ag. **Ref:** 158.

Andy O.

(see Andy O'Neil)

Andy O'Neil (Andy O.) (227)

Loc: NE¼SW¼ sec. 22, (31-30E), adjoining Anchor claim on NE. **Access:** 2½ mi. W. of Nespelem by road. **Prop:** 4 unpatented claims. **Owner:** Frank Ostrowski (1939-1941). **Ore:** Silver, lead, copper. **Ore min:** Galena, pyrite, chalcopryrite, tetrahedrite, bornite, marcasite. **Gangue:** Quartz, calcite. **Deposit:** Fissure veins in granite at and near its contact with quartzite. Ore minerals constitute 25% of the vein in places. Veins 1 to 4 ft. wide. **Dev:** 800 ft. of workings on 3 levels, including 2 winzes and a haulage adit. **Assays:** Typical assay said to be 30 oz. Ag, 20% Pb, \$0.75 Au. **Prod:** Test shipment prior to 1940. **Ref:** 129, pp. 214-215. 158.

Anna (232)

Loc: Near SE. cor. sec. 17, (31-30E), 2 mi. NW. of the Apache workings on Multnomah Hill, Nespelem dist. **Prop:** 1 claim. **Owner:** G. H. Beggs, Nespelem, Wash. (1939). **Ore:** Silver, lead. **Ore min:** Mainly galena and pyrite, some sphalerite and chalcopryrite. **Deposit:** Small mineralized quartz veins in fracture zone in granite. Zone about 4 ft. in width. **Dev:** Adit and shaft. **Assays:** Samples from shaft reportedly assayed 43 oz. Ag. **Ref:** 158.

Antimony Gold

(see Abernathy under copper)

Antimony Queen (36)

(see under antimony)

Apache (235)

Loc: SE¼ sec. 27, (31-30E), near crest of SE. spur of Mineral Hill. **Elev:** 2,100 ft. **Access:** 2½ mi. SW. of Nespelem by dirt road. **Prop:** 3 unpatented claims. **Owner:** Apache Gold Mines, Inc., Nespelem, Wash. (1937-1942). Apache Mining Co. (1908-1926). **Ore:** Silver, gold, lead. **Ore min:** Argentite, galena, tetrahedrite, pyrite, native silver, sphalerite, pyrargyrite, stephanite, chalcopryrite. **Gangue:** Quartz, rhodochrosite. **Deposit:** Tabular lenses and veinlets of ore along an 8- to 10-ft. fracture zone in granite. Ore-bearing portion of the zone is 1 to 2 ft. wide. **Dev:** Main haulage adit 700 ft. long, 2,500 ft. of workings on 3 levels, including 3 shafts and 3 adits. **Assays:** High-grade ore 300 oz. Ag, ¾ oz. Au, 1½% Cu. Mill-run ore reportedly about \$12 per ton. **Prod:** 29 tons of ore with gross value of \$10,170 in 1911-1912. Also produced 1916-1917, 1919-1922, 1925-1926, 1937-1940. Est. production to 1940 \$250,000 Ag, \$20,000 Au. **Ref:** 88, p. 34. 97, 1908, 1911-1913, 1915-1916, 1919-1922, 1925-1926, 1938. 98, 1922, p. 1633; 1925, p. 1802; 1926, p. 1568. 105, 12/5/08, p. 761. 122, pp. 72-74. 129, pp. 207-209. 141, p. 22. 158.

Apex (167)

(see under copper)

Arizona

(see Horn Silver)

Arizona

Loc: Near Ruby. **Owner:** George Melvin (1892). **Ore:** Silver, gold. **Ore min:** Tetrahedrite. **Deposit:** 6-ft. quartz vein. An extension of the Buckeye. **Dev:** 70-ft. adit, 25-ft. shaft. **Assays:** Reportedly \$100 to \$260 Au, Ag. **Ref:** 12, p. 52. 13, p. 85. 104, 2/29/36, p. 28.

Arlington (161)

Loc: SW¼SW¼ sec. 5, (34-25E), on W. slope of Ruby Hill. **Elev:** 4,400 ft. **Access:** 4 mi. by road from the Salmon Cr. road at Ruby. **Prop:** 9 patented claims: Arlington, Arlington Fr., 1806, Minnesota, Missing Link, Pomeroy, Princess, Riley, Eureka; and 3 unpatented claims. **Owner:** Arlington Mines, Inc. (1937-1945). Arlington Mining Corp. (1905-1933). Ruby Mountain Mining Co. (1935-1936). **Ore:** Silver, copper, lead, gold. **Ore min:** Argentiferous galena, chalcopryrite, tetrahedrite, sphalerite, pyrite, pyrargyrite. **Deposit:** Quartz vein mainly in granite near contact with schist. Main vein av. 4½ ft. in width and carries ore in banded segregations. Other similar but smaller parallel veins. **Dev:** About 4,500 ft. of underground workings on at least 3 levels. **Assays:** 24 cars av. in 1920; 66 oz. Ag, 0.02 oz. Au, 1.15% Cu. 2 ore shoots in floor of 100-ft. level at bottom of shaft said to total 350 ft. in strike length, av. width of about 2½ ft., and av. assay of about 18 oz. Ag (1947). **Prod:** 1,000 tons in 1901, shipped siliceous ore 1914-1921, shipped conc. in 1937, 80,000 oz. Ag and 33,000 lb. Cu in 1938, shipped in 1940. 5,700 tons mined in 1937-1939 was milled and gave net value at smelter of \$71,683. Total production \$144,650. **Ref:** 12, pp. 47-48. 13, p. 80. 33, 1908, p. 337. 63, p. 92. 68, p. 5. 75, pp. 32-34. 88, pp. 33-34. 97, 1914-1921, 1938, 1941. 98, 1920, 1922, 1925, 1926. 104, 12/15/35, p. 26; 11/30/36, p. 29. 108, 7/39, p. 9; 9/40. 112, 1918, p. 167. 113, no. 13, 1937, p. 7. 129, pp. 250-253. 130, p. 87. 157. 158.

Atkins (192)

(see under lead)

Aztec (173)

(see under iron)

Beaver (182)

(see under gold)

Bellevue (92)

(see under gold)

Ben Harrison

(see Apex under copper)

Bergman

(see Shaw-Bergman under copper)

Big Boy (16)

(see under gold)

Big Hole

(see under gold)

Billy Goat (4)

(see under copper)

Bi-Metallic (184)

(see under molybdenum)

Black Bear (103)

(see under gold)

Black Huzzar

Loc: Galena area, NW. of the Silver Belle group, Conconully dist. **Prop:** 1 claim. **Owner:** Gus Lieder and A. D. McKey (1892). **Ore:** Silver, copper, gold. **Ore min:** Argentite, chalcocite. **Deposit:** 3½-ft. quartz vein. **Assays:** 90 oz. Ag, 3.50% Cu, tr. Au. **Ref:** 13, p. 111.

Black Jack (39)

(see under gold)

Black Warrior

(see under gold)

Blanche (77)

(see under gold)

Blue Daisy

Loc: Conconully dist. **Ore:** Silver. **Assays:** 70 oz. Ag. **Ref:** 12, p. 61. 13, p. 112.

Blue Grouse (151)

(see under lead)

Bodie (186)

(see under gold)

Bolinger (38)

(see under gold)

Bornite

(see Peacock under copper)

Boundary (Sheep Mountain)

(see Sheep Mountain under molybdenum)

Boundary

Loc: Okanogan County. **Owner:** S. J. Polley, et al., Mason City, Wash. (1938). **Ore:** Silver. **Ref:** 158.

Bridgeport

Loc: Conconully dist. **Ore:** Silver, lead. **Ref:** 58, p. 10. 63, pp. 93-94.

Brunswick

(see under lead)

Buck Mountain (50)

(see under tungsten)

Buckeye (108)

(see under copper)

Buckeye

Loc: Near Ruby on Ruby Hill. **Prop:** 1 claim. **Owner:** George Melvin (1892). **Ore:** Silver, gold. **Ore min:** Tetrahedrite. **Deposit:** 7-ft. vein of quartz. **Dev:** 70-ft. adit. **Assays:** An old assay reports \$100 Au, Ag. **Ref:** 12, p. 52. 13, p. 85.

Buckhorn

(see Buck Mountain under tungsten)

Bullfrog (88)

(see under gold)

Bunker Hill

(see Silver King under lead)

Butcher Boy (168)

(see under gold)

Caaba

(see Kaaba under lead)

Cabin (236)

(see under lead)

Callahan

(see Plant-Callahan)

Calumet

(see under gold)

Caribou (174)

(see under gold)

Carl Frederick (122)

Loc: Near NW. cor. sec. 35, (37-23E), near W. crest of Clark Peak, Conconully dist. **Elev:** 7,200 ft. **Access:** 9 mi. by trail up Salmon and Peak Creeks, thence over 7,600-ft. pass between Clark Peak and Tiffany Mtn. **Prop:** 9 unpatented claims. **Owner:** Carl Frederick Mining Co. (1921-1926). **Ore:** Silver, lead. **Ore min:** Argentiferous galena, cerargyrite, argentite, bromyrite. **Gangue:** Quartz. **Deposit:** 1 to 4 ft. of crushed ledge matter in which is a 4- to 24-in. quartz vein. Vein is sparsely mineralized except for one shoot 50 ft. long. **Dev:** 400-ft. drift, 268-ft. crosscut. **Assays:** Some ore said to av. 20 oz. Ag. **Ref:** 98, 1922-1926. 129, pp. 256-257.

Carr (5)

(see under copper)

Castle Creek (196)

(see under lead)

Catherine (58)

Loc: Secs. 22 and 23, (40-25E), Nighthawk dist. **Owner:** Boundary Consolidated Metals, Inc., Seattle, Wash. **Ore:** Silver, lead, zinc, copper. **Ref:** 158.

Central (Trinidad) (124)

Loc: Near center sec. 10, (36-26E), on shore of Turtle Lk. **Elev:** 2,000 ft. **Access:** 10 mi. by road SW. of Tonasket. **Prop:** 12 claims. **Owner:** Trinidad Mining & Smelting Co. (1915-1926). **Ore:** Silver, lead, gold, copper, zinc. **Ore min:** Galena, chalcocopyrite, pyrite, sphalerite. **Deposit:** Irregular mineralized zone in aplite porphyry dike intruding argillite and hornblende porphyry. Zone 300 ft. wide. **Dev:** 50-ft. shaft from which 2 short drifts have been driven. **Assays:** 6 to 8 oz. Ag. 30-ton shipment av. \$12 Au, Ag. **Prod:** 30 tons in 1918. **Ref:** 58, p. 69. 97, 1918, p. 506. 98, 1918-1926. 112, p. 206. 129, pp. 257-258. 141, p. 22.

Central (American Flag)

(see American Flag under gold)

Central (Park and Central)

(see Park and Central under lead)

Chesaw (169)

(see under gold)

Chicago (107)

(see under gold)

Chickamun (34)

(see under copper)

Chief Sunshine (Sunshine Chief) (143)

Loc: SW¼SE¼ sec. 35, (36-24E). **Access:** 2½ mi. from Conconully. **Prop:** 7 unpatented claims. **Owner:** Alfred Davidson, Conconully, Wash. (1941). **Ore:** Silver, lead, zinc, copper, gold. **Ore min:** Tetrahedrite, galena, pyrite. **Deposit:** Quartz vein near a lamprophyre dike in granite. Vein av. about 1 ft. in width. Short sections of the vein are heavily mineralized. **Dev:** 500-ft. adit, 360-ft. adit. **Improv:** 2 cabins and a road built in 1941. **Assays:** Ore said to av. \$20 per ton. One assay shows 94.90 oz. Ag, 15% to 16% Pb, 8.8% Zn, 3.5% to 4.5% Cu, 0.035 oz. Au. **Prod:** Sporadic shipments in 1937, 1938, 1940, 1941. **Ref:** 46, pp. 214-215. 97, 1938, p. 459; 1939, p. 490. 158.

Chilson

(see under lead)

Chloride

Loc: Twisp dist. **Prop:** 1 claim. **Owner:** Robert Allison, H. E. Davis, and John Mulholland (1892). **Ore:** Silver, copper, antimony, gold. **Ore min:** Argentite, chalcocite, stephanite, malachite. **Deposit:** 4-ft. quartz vein. **Dev:** 100-ft. adit. **Assays:** 240 to 650 oz. Ag, 1.25% to 2.0% Cu, tr. Au. **Ref:** 12, p. 68. 13, p. 112.

Chopaka (55)

Loc: S½ sec. 10, (40-25E), Nighthawk dist. **Prop:** 1 claim. **Owner:** Professor Riley (1892). **Ore:** Silver, gold, copper. **Ore min:** Pyrite, chalcopyrite. **Deposit:** 10-ft. quartz vein. **Dev:** 30-ft. drift. **Assays:** 0.80 to 1.10 oz. Au, 75 to 125 oz. Ag, 1.50% to 1.90% Cu. **Ref:** 13, p. 108.

Cleopatra

(see under gold)

Combination (109)

(see under gold)

Continental

(see Mazama Queen under gold)

Controller (215)

(see under copper)

Copper Glance (7)

(see under copper)

Copper King (126)

(see under lead)

Copper World (98)

(see under copper)

Copper World Extension (99)

(see under copper)

Copper Zone

(see under copper)

Cornucopia

(see under gold)

Crescent

(see Triune under gold)

Crown Point

(see Imperial under gold)

Crystal Butte (181)

(see under gold)

Crystalite

(see under gold)

Curlew (66)

(see under gold)

Daisy (9)

(see under gold)

Damfino (40)

(see under gold)

Defiance (113)

(see under gold)

Delaware

Loc: On S. side of Similkameen R., Nighthawk dist. **Prop:** 1 claim. **Owner:** Messrs. Hamilton, Smith, and Gibson (1892). **Ore:** Silver, gold. **Ore min:** Argentite. **Deposit:** 2-ft. quartz vein. **Dev:** Two 15-ft. shafts. **Assays:** Assays from shaft, outcrops, and dump show 0.10 to 1.10 oz. Au, 110 to 115 oz. Ag. **Ref:** 13, p. 110.

Denver City

(see Leadville under gold)

Dexter

Loc: On W. side of Ellemeham Mtn., 1½ mi. from Palmer Lk., Nighthawk dist. **Prop:** 1 claim. **Owner:** M. S. Dudley, Thomas Hanway and Frederick Bowman (1892). **Ore:** Silver, gold. **Ore min:** Argentite. **Deposit:** Quartz vein. **Dev:** 300-ft. drift. **Assays:** As high as \$300 Au, Ag reported. **Ref:** 13, p. 110.

Diamond (147)

Loc: W. of Lady of the Lake property, approx. in sec. 1, (35-24E), Conconully dist. **Ore:** Silver, gold. **Deposit:** 4 ft. of ore with an 18-in. paystreak. **Dev:** 20-ft. adit. **Assays:** \$60 Au, Ag. **Ref:** 12, p. 58. 13, p. 112.

Diamond Queen (51)

(see under gold)

Dividend (81)

(see under copper)

Dixie Queen

(see Antimony Queen under antimony)

Dodd

(see Sheep Mountain under molybdenum)

Double Eagle

(see Dry Bone under lead)

Double Header

(see Little Chief)

Dry Bone

(see under lead)

Duke of Windsor

(see Dry Bone under lead)

Eagle (67)

(see under lead)

Eloise (68)

Loc: Sec. 23, (40-25E), Nighthawk dist. **Owner:** Mines Operating Co. (1918). **Ore:** Silver, lead, copper, gold. **Ref:** 112, p. 18.

Emerald (49)

(see under gold)

Empire (97)

(see under gold)

Empress

(see under gold)

Esther (127)

(see under lead)

Eureka (197)

(see under lead)

Eureka (75)

(see under lead)

Eureka

(see under lead)

Eureka

Loc: Galena area, NW. of Silver Belle group, Conconully dist. **Prop:** 1 claim. **Owner:** Gus Lieder and A. D. McKey (1892). **Ore:** Silver, copper, gold. **Ore min:** Argentite, chalcocite. **Deposit:** 4-ft. quartz vein. **Assays:** 0.10 oz. Au, 370 oz. Ag, 3.90% Cu. **Ref:** 13, p. 111.

Evening (228)

Loc: S½SE¼ sec. 21, (31-30E), 4 mi. W. of Nespelem. **Access:** Road. **Ore:** Silver, copper, lead, zinc. **Ore min:** Chalcopyrite, galena, sphalerite. **Gangue:** Epidote, vesuvianite. **Deposit:** Roof pendant of argillite and schist about 10 acres

in extent. Certain limy layers altered to lime-silicates contain the ore minerals. **Dev:** Few small open pits. **Assays:** A picked sample containing coarse crystals of galena assayed 20.2 oz. Ag, tr. Au. **Ref:** 122, pp. 83-84.

Evening Star (128)

Loc: Sec. 31, (36-25E), northern extension of the Minnehaha property, Conconully dist. **Prop:** 1 claim. **Owner:** Messrs. Segmar and Manual (1892). **Ore:** Silver, copper. **Ore min:** Native silver, chalcopyrite. **Deposit:** 4-ft. vein exposed on the surface. **Dev:** 60-ft. shaft. **Ref:** 13, p. 93.

Excelsior (42)

(see under gold)

Fairview

(see under lead)

Fairview

(see under gold)

Favorite (69)

(see under lead)

Finella

(see under iron)

First Thought (152)

Loc: NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 31, (35-25E), on Ruby Mtn. **Owner:** Benton Bailey, lessee (1949). First Thought Silver Mining Co. (1922-1926). **Ore:** Silver, lead, copper, zinc. **Ore min:** Tetrahedrite, stephanite, galena, chalcocite, sphalerite, pyrite, chalcopyrite. **Deposit:** Quartz lenses as much as 700 ft. in dia. and 90 ft. thick parallel the foliation in schist and gneiss. Lenses mineralized on foot and hanging walls. **Dev:** About 4,000 ft. of workings on 3 levels. **Assays:** 75 to 80 tons of carefully sorted ore produced in 1922 assayed 75 to 100 oz. Ag. Wide ore bodies av. 6 to 8 oz. Ag. Old assays across the vein showed \$30 Ag. **Prod:** More than \$66,000 reported. **Ref:** 12, pp. 49-50. 13, pp. 79-80. 63, p. 93. 68, p. 5. 75, pp. 31-32. 97, 1921, p. 427. 98, 1922-1926. 129, p. 255. 157.

Fluorspar

(see Tonasket under copper)

Four Metals (57)

(see under lead)

Fourth of July (162)

Loc: SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 5, (34-25E), near crest of Ruby Hill, $\frac{1}{2}$ mi. N. of Arlington mine, Conconully dist. **Elev:** 4,500 ft. **Owner:** Leased to Benton Bailey (1949). **Ore:** Silver, copper, gold. **Ore min:** Tetrahedrite, argentite, native silver, stephanite, cerargyrite, ruby silver. **Gangue:** Quartz. **Deposit:** Vein said to av. 10 ft. in width and to carry a streak of sulfide ore 18 to 24 in. in av. width. **Dev:** 500-ft. shaft. **Assays:** Av. assays said to be \$100 per ton mostly in silver. Gold is in trace amounts. **Prod:** \$36,000 recorded. **Ref:** 12, pp. 48-49. 13, pp. 80-81. 63, p. 93. 68, p. 5. 75, p. 32. 129, pp. 255-256.

Frankie Boy (148)

Loc: NW $\frac{1}{4}$ sec. 2, (35-24E), Conconully dist. **Owner:** Washington Consolidated Mines & Reduction Co. (1915-1918). **Ore:** Silver, lead, copper, molybdenum. **Ore min:** Chalcopyrite, galena, tetrahedrite, pyrite, molybdenite. **Deposit:** 1-ft. quartz vein in granite. **Ref:** 75, p. 28. 112, p. 209.

Friday (52)

(see under gold)

General Miles (205)

(see under lead)

Goat Creek

(see under copper)

Gold Axe (175)

(see under gold)

Gold Coin (17)

(see under gold)

Gold Crown (60)

(see under gold)

Gold Crown (Spokane)

(see Spokane under gold)

Gold Cup

Loc: Galena area, adjacent to Black Huzzar group, Conconully dist. **Prop:** 1 claim. **Owner:** Isaac H. Durboraw, Tacoma, Wash. (1892). **Ore:** Silver, gold. **Assays:** \$80 Ag, tr. Au. **Ref:** 13, p. 112.

Gold Dust (82)

(see under copper)

Gold Eagle (61)

Loc: Galena area, adjacent to Black Huzzar group. Possibly sec. 32, (40-25E), Conconully dist. **Prop:** 1 claim. **Owner:** Percy O. Luce, Coulee Dam, Wash. (1949). Isaac H. Durboraw, Tacoma, Wash. (1892). **Ore:** Silver, gold. **Assays:** \$120 Ag, tr. Au. **Ref:** 13, p. 112.

Gold Hill (105)

(see under gold)

Golden Chariot (83)

(see under copper)

Golden Zone (54)

(see under gold)

Goodenuff (224)

Loc: Secs. 8 and 9, (31-30E). **Ore:** Silver, lead, gold, copper. **Deposit:** Deposit and mineralization similar to that of the Home Run, which see. **Dev:** 25-ft. shaft (1913). **Ref:** 58, p. 26. 122 p. 83.

Gould & Curry (237)

(see under lead)

Grand Coulee

(see Little Chief)

Grandview (Leadville)

(see Leadville under gold)

Grandview

(see under gold)

Grant

(see Roosevelt under iron)

Great Divide (229)

Loc: SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 16, (31-30E), Nespelem dist. **Access:** 4 mi. W. of Nespelem by road. **Ore:** Silver, lead, gold. **Ore min:** Pyrite, chalcopyrite, galena, chalcocite. **Gangue:** Quartz, sericitized granite. **Deposit:** Zone 50 ft. or more wide in which the granite is seamed, fractured, and sericitized. Mineralized along the fractures and in small quartz veinlets. Bunches of ore minerals up to 2 ft. in dia. **Dev:** 300-ft. adit with 100 ft. of crosscuts, several small shafts and pits. **Assays:** "Bunches" of ore said to assay as high as 100 oz. Ag. **Ref:** 58, p. 27. 122, p. 78.

Great Metals

(see Anchor)

Great Western (211)

(see under lead)

Grover Cleveland

(see under lead)

Grubscher

(see Gubser under lead)

Gubser

(see under lead)

Hanford (198)

(see under lead)

Hanks (3)

(see under copper)

Hardscrabble (130)

Loc: Sec. 30, (36-25E), NE. of the Mammoth claim, Conconully dist. **Prop:** 1 claim. **Owner:** Hardscrabble Mining & Milling Co. (1891-1892). **Ore:** Silver, antimony. **Ore min:** Stephanite. **Deposit:** 15-in. vein with an 11-in. paystreak. **Dev:** 30-ft. drift. **Assays:** 3 old assays gave 178, 335, and 658 oz. Ag. **Ref:** 12, p. 59. 13, p. 95.

Hargrove

(see Silver King under lead)

Hart Stone

(see Kelsey under copper)

Hattie

(see under gold)

Hehe

(see under gold)

Henrietta (44)

(see under gold)

Hercules (206)

(see under lead)

Hercules (117)

(see under gold)

Hiawatha (93)

(see under gold)

Hidden Treasure (131)

Loc: Sec. 31, (36-25E), NE. of Diamond prospect, Conconully dist. **Ore:** Silver, gold. **Deposit:** 2 ft. of ore exposed. **Dev:** 50-ft. shaft. **Assays:** Ore from bottom of shaft assayed \$63 Ag, Au. **Ref:** 12, p. 59, 13, p. 98.

Hidden Treasure (209)

(see under copper)

Hidden Treasure (Highland) (45)

(see under gold)

Hill-Thomas

Loc: Twisp dist. **Prop:** 1 claim. **Owner:** Messrs. Hill and Thomas (1892). **Ore:** Silver, gold. **Deposit:** 13 in. of ore. **Dev:** 75-ft. inclined shaft. **Assays:** 118 to 325 oz. Ag, tr. Au. **Ref:** 13, p. 113.

Hilo

(see St. Paul)

Home Run (225)

Loc: NW¼SE¼ sec. 8, (31-30E), Nespelem dist. **Ore:** Silver, copper, gold. **Ore min:** Chalcopyrite, pyrite, magnetite, specularite. **Gangue:** Epidote, hornblende. **Deposit:** Quartzite and silicified argillite surrounded and metamorphosed by granite. **Dev:** 30-ft. shaft. **Assays:** Sample representative of a small portion of the mass assayed 2.32 oz. Ag, 0.51% Cu, tr. Au. **Ref:** 122, p. 82.

Homestake (132)

(see under lead)

Horn Silver (Arizona) (76)

Loc: S½ sec. 21, (40-26E), Nighthawk dist. **Prop:** 5 claims. **Owner:** Hornsilver Mining Co. (1902-1915). **Ore:** Silver, copper, gold. **Ore min:** Stephanite, cerargyrite, a little proustite, galena, sphalerite, pyrite, chalcopyrite. **Gangue:** Quartz. **Deposit:** 3 veins. The one which has been most developed is 4 in. to 4 ft. wide and is composed of well-mineralized quartz. Country rock is argillite and granite. **Dev:** 750 ft. of adit, a raise of 100 ft., and a shaft 100 ft. deep. **Assays:** 2 carloads of ore av. \$62 per ton. \$2.50 of this amount was in Cu and Au, the remainder in Ag. **Prod:** Several carloads of ore prior to and during 1909. **Ref:** 97, 1910, p. 604. 104, 12/15/35, p. 26; 6/15/37, p. 32. 106, 8/2/29, 5/1/30. 154, p. 100. 158.

Hotchkiss

(see Mazama Pride under gold)

Hudnut (Hudnutt) (233)

(see under zinc)

Hunter (46)

(see under gold)

Ida (183)

(see under gold)

Idaho

Loc: Adjoins War Eagle property W. of Ruby. **Access:** Truck road from main county road. **Owner:** Idaho Mining Co. (1892). **Ore:** Silver, lead, gold. **Gangue:** Quartz. **Deposit:** 14-ft. vein with 2-ft. paystreak. **Dev:** 50-ft. shaft, crosscut. **Assays:** 6 old assays show tr. Au, 34 to 54 oz. Ag, 3.75% to 9% Pb. **Ref:** 12, pp. 51-52. 13, p. 83.

Imperial (13)

(see under gold)

Independence

Loc: On Mineral Hill, Conconully dist. **Owner:** John Stech, Seattle, Wash. (1897). **Ore:** Silver, lead. **Dev:** 100-ft. shaft. **Ref:** 63, p. 94.

Independent (207)

(see under lead)

Iron Cap

(see under gold)

Iron Cap and Snow Cap (23)

(see under gold)

Iron Crown

(see under gold)

Iron Dike (195)

(see under zinc)

Iron Mask

(see Copper World Extension under copper)

Iron Master (100)

(see under gold)

Ivanhoe (111)

Loc: SW¼ sec. 16, (39-26E), Palmer Mtn. dist. **Elev:** 3,700 ft. **Prop:** 4 claims. **Owner:** Ivanhoe Mining Co. (1918-1926). Spokane-Edmonton Mining Co. (1918-1924). **Ore:** Gold, silver. **Ore min:** Pyrite, stephanite, cerargyrite, ruby silver. **Deposit:** Fine-grained iron-stained quartz vein enclosed in calcareous slate. Vein 3½ to 4½ ft. wide with a 2½-ft. paystreak. **Dev:** 65-ft. and 80-ft. inclines. **Assays:** Ore shipped said to have netted \$272 to \$636 per ton. **Prod:** Considerable ore shipped about 1900. **Ref:** 12, pp. 63-64. 13, p. 99. 63, p. 99. 98, 1918-1926. 112, pp. 185, 203. 154, p. 102.

Jackpot (176)

(see under gold)

Japan

(see under copper)

Jim Dodd

(see Sheep Mountain under molybdenum)

John Arthur (144)

Loc: Sec. 36, (36-24E), an extension of the Lone Star mine, Conconully dist. **Prop:** 1 claim. **Owner:** J. T. McDonald, Ellensburg, Wash. (1892). **Ore:** Silver, gold. **Ore min:** Pyrite, argentite, wire silver. **Gangue:** Quartz. **Deposit:** 10-ft. vein with a 2- to 2½-ft. paystreak. **Dev:** 70-ft. inclined shaft. **Assays:** 30 to 116 oz. Ag, tr. to 5 oz. Au. **Ref:** 13, p. 88. 63, p. 93.

John Judge

(see Leadville under gold)

Jones (20)

(see under copper)

Josie

(see Hiawatha under gold)

Juanita

(see under gold)

Julia (64)

(see under lead)

Jumbo

(see under gold)

Junction

(see under gold)

Kaaba (70)

(see under lead)

Kaaba-Texas

(see Kaaba under lead)

Kankakee (230)

(see under copper)

Kansas (153)

(see under copper)

Kelsey (84)

(see under copper)

Key (133)

Loc: NW¼ sec. 31, (36-25E), on E. side of Salmon R. **Elev:** 2,500 ft. **Access:** 1½ mi. N. of Conconully by road. 18 mi. by road to railroad at Okanogan. **Prop:** 6 claims. **Owner:** W. A. Hargraves, Conconully, Wash. (1941). **Ore:** Silver, lead, gold, copper, bismuth. **Ore min:** Galena, pyrite, chalcopryrite, sphalerite. **Deposit:** Vein 3 to 10 ft. wide in granite and mica schist. Most of the vein is too low grade for shipping ore but is high enough for milling ore. **Dev:** 300-ft. adit, 45-ft. shaft, 105-ft. drift. **Assays:** 12 tons av. \$37 Ag, Pb. **Prod:** 12 tons shipped to Trail smelter in 1914. **Ref:** 46, p. 207. 75, p. 25. 97, 1914, p. 651. 158.

Keystone (134)

Loc: Sec. 31, (36-25E), on Ruby Mtn. S. of Fourth of July mine. **Owner:** Keystone Mining Co. (1890). **Ore:** Silver, gold. **Deposit:** 8-ft. vein. **Dev:** 150-ft. shaft. **Assays:** Old assay of ore on dump gave \$45 Au, Ag. **Ref:** 12, pp. 52-53. 13, p. 85.

Kimberly (90)

(see under lead)

King Solomon

(see under gold)

Kodak

(see under gold)

Kyota (191)

Loc: Sec. 3, (34-30E). **Prop:** 3 claims. **Owner:** Frank W. Meyer (1934). **Ore:** Silver, gold. **Deposit:** Vein 30 in. wide at face of adit. **Dev:** 60-ft. adit. **Assays:** 2 assays showed tr. Au, 0.30 to 0.46 oz. Ag. **Ref:** 158.

Lady of the Lake (149)

Loc: NE¼ sec. 6, (35-25E), on S. extremity of Homestake Mtn. **Elev:** 2,350 ft. **Access:** ½ mi. E. of Conconully by road. 18 mi. by road to railroad at Okanogan. **Prop:** 2 claims: Lady of the Lake, Hidden Springs. **Owner:** Wm. P. Shirk, Spokane, Wash. (1951). Sie Walter leasing to J. E. Lindston (1942). **Ore:** Silver, copper, lead, zinc, gold, tungsten. **Ore min:** Galena, pyrite, chalcopryrite, sphalerite, molybdenite, scheelite. **Gangue:** Quartz, calcite. **Deposit:** Sheared and fractured mineralized zones mostly 3 to 5 ft., but in places 20 ft. wide in fine-grained metamorphic rocks. Zones are principally vein quartz. **Dev:** 150-ft. adit, 50 ft. of drifts, several open cuts, a caved adit, and a 24-ft adit below high-water level of Conconully Lk. **Assays:** 70 to 125 oz. Ag, 11% to 15% Pb, tr. Au. 13 samples across widths of 4 to 12 ft. gave weighted av. of 0.163% WO₃ and showed 0.02% to 0.06% Cu, 0.1% to 0.3% Pb, 0.1% to 0.4% Zn, 0.02% to 0.06% Mo. **Ref:** 12, p. 58. 13, p. 92. 37, pp. 43-44. 75, p. 29. 157. 158.

Laeuna

(see Leuena)

Lakeview

(see Prize under lead)

Last Chance (154)

Loc: SE¼NE¼ sec. 31, (35-25E), at N. end of Ruby Hill, Conconully dist. **Elev:** 3,500 ft. **Access:** Mine openings reached by the Arlington mine road 1½ mi. NW. of the Arlington mine. **Owner:** Leased to Benton Bailey, Okanogan, Wash. (1949). **Ore:** Silver, lead, copper, zinc. **Ore min:** Argentiferous tetrahedrite, galena, chalcopryrite, sphalerite, pyrite. **Gangue:** Quartz. **Deposit:** Vein in gneiss and schist varies from 8 to 20 ft. and av. 12 ft. in width. One payshoot had a width of 2 to 4 ft. and a length of 200 ft. **Dev:** 650-ft. drift, 300-ft. shaft with 800-ft. drift at bottom. **Assays:** Ore shipped (1920) av. 30 oz. Ag, 17% Pb, 4% Cu. **Prod:** 1920, 1921, 1924. **Ref:** 46, p. 201. 68, p. 5. 75, p. 32. 97, 1920, 1921, 1924. 104, 12/15/35, p. 26. 129, pp. 254-255. 141, p. 20.

Last Chance (43)

(see under gold)

Launa

(see Leuena)

Leadville (101)

(see under gold)

Leonora (155)

(see under lead)

Leuena (Laeuna, Launa) (145)

Loc: SW¼ sec. 35, (36-24E), near crest of S. spur of Mineral Hill, Conconully dist. **Elev:** 4,600 ft. **Prop:** 1 claim. **Owner:** Thomas L. Nixon and Chester F. Griesemer, Tacoma, Wash. (1892). **Ore:** Silver, copper, gold. **Ore min:** Tetrahedrite, stephanite, argentite. **Deposit:** Quartz vein 7 ft. wide. **Dev:** 50-ft. shaft, 75-ft. shaft, 60-ft. adit, 70-ft. crosscut. **Assays:** Assays as high as 200 to 860 oz. Ag, 1.13% to 2.12% Cu, tr. Au. **Prod:** Reportedly several carloads shipped to San Francisco prior to 1890. **Ref:** 12, p. 59. 13, p. 96. 75, pp. 28-29.

Lilman (217)

Loc: Sec. 26, (31-30E), adjacent to Apache claim. **Access:** Road. **Prop:** 3 unpatented claims: Lilman, Lilman Fraction, Nina Lu. **Owner:** L. E. Latourette, Portland, Oreg. (1940). **Ore:** Silver, gold, copper, nickel. **Ore min:** Tetrahedrite, chalcopyrite, pyrite, pyrrhotite. **Deposit:** Said to be replacement veins in granite from 1½ to 20 ft. wide. **Dev:** 150-ft. adit, 50-ft. shaft, 35-ft. shaft. **Assays:** 64 oz. Ag, 0.12 oz. Au, 2.6% Cu. Picked samples as high as 2,000 oz. Ag. **Prod:** 16 tons prior to 1940. **Ref:** 158.

Little Chief (Double Header, Grand Coulee) (218)

Loc: NW¼ sec. 35, (31-30E). **Elev:** 2,050 ft. **Access:** 3 mi. SW. of Nespelem by good gravel road. **Prop:** 18 unpatented claims. **Owner:** Ruby Silver Mines, Inc., Yakima, Wash. (1953—). Double Header Mining Co. (1911-1926). Grand Coulee Mines (1936-1938). Nespelem Consolidated Mines, Inc. (1939-1940). **Ore:** Silver, gold, copper. **Ore min:** Pyrargyrite, argentite, stephanite, pyrite, antimony oxide (?), chalcopyrite. **Gangue:** Quartz, sericite, calcite. **Deposit:** Ore shoots along a fracture zone in granite 2 to 10 ft. wide. Largely replaced by quartz. **Dev:** 3,000 ft. of workings on 3 levels include 3 adits, a shaft, and 7 stopes. **Assays:** Assay value of different lots of ore shipped to smelter in 1911 and 1912 ranged from 0.09 oz. Au, 77.7 oz. Ag to 0.31 oz. Au, 590.59 oz. Ag. Another assay shows 4% Cu. **Prod:** More than \$10,000 by 1921. Produced in 1937, 1954. **Ref:** 97, 1912, 1918, 1919, 1938. 98, 1918-1926. 105, 1911, p. 773. 112, p. 176. 122, p. 74. 129, pp. 213-214. 141, p. 22.

Little Chopaka (71)

(see under lead)

Little Johnnie (238)

Loc: Sec. 27, (31-30E), adjoining Apache claim on W., Nespelem dist. **Ore:** Silver, gold. **Ref:** 158.

London

(see Methow under gold)

Lone Pine (Submarine) (78)

Loc: N½ sec. 3, (40-26E), a few hundred yd. S. of the international boundary. **Elev:** 2,600 ft. **Access:** 10 mi. by road from Oroville. **Owner:** Southern Minnesota & Washington Mining Co. (1921-1924). **Ore:** Silver, lead, copper, gold. **Ore min:** Argentiferous galena, chalcopyrite, pyrite, and a little covellite and bornite. **Gangue:** Quartz. **Deposit:** A 1- to 10-ft. quartz vein in gabbro contains milling ore. Vein shattered by post-mineral movements. **Dev:** 300-ft. adit, 1,000-ft. adit, other short adits. **Ref:** 58, p. 65. 98, 1922, p. 1666; 1925, p. 1833. 129, pp. 243-244.

Lone Star (11)

(see under gold)

Lone Star (Star) (146)

(see under lead)

Louisa

(see Standard and Louisa under gold)

Lucky Jim (21)

(see under copper)

Lucky Lady (Silver Queen) (119)

Loc: Secs. 33 and 34, (38-26E) and sec. 3, (37-26E), 12 mi. W. of Tonasket. **Prop:** 2 claims: Silver King, Silver Queen. **Owner:** Lucky Lady, Inc. (1937). **Ore:** Silver, gold. **Ref:** 58, p. 41. 158.

Luke

(see Molly under copper)

Lulu

Loc: Galena area, NW. of Silver Belle group. **Prop:** 1 claim. **Owner:** Gus Lieder and A. D. McKey (1892). **Ore:** Silver, copper, gold. **Ore min:** Argentite, chalcocite. **Deposit:** 4-ft. quartz vein. **Assays:** 0.10 oz. Au, 320 oz. Ag, 0.40% Cu. **Ref:** 13, p. 111.

McGrath

(see under zinc)

MacLean

(see Roosevelt under iron)

Majestic

(see under gold)

Mammoth (135)

Loc: Sec. 30, (36-25E), NE. of the Monitor property. **Prop:** 1 claim. **Owner:** Robert Hargrove, Conconully, Wash. (1892). **Ore:** Silver, copper, gold. **Gangue:** Quartz. **Deposit:** 2 veins, upper one 5 ft. and lower one 6 ft. thick. **Dev:** Each vein developed by a 30-ft. crosscut. **Assays:** Upper vein, 7.13% Cu, 330 oz. Ag, 3.10 oz. Au. Lower vein, 87 oz. Ag, 1.10 oz. Au. **Prod:** A shipment of ore to the smelter at Helena, Montana, in 1889 netted \$250 per ton. **Ref:** 13, p. 95.

Maquae

(see under gold)

Marguerite (156)

(see under copper)

Mazama Pride (18)

(see under gold)

Mazama Queen (10)

(see under gold)

Methow (47)

(see under gold)

Mid Range (24)

(see under gold)

Mills

(see under gold)

Mineral Hill (Washington Consolidated, Seven Devils) (136)

Loc: Near SW. cor. sec. 31, (36-25E) and extending up Mineral Hill to N½ sec. 2, (35-24E). **Elev:** 2,300 to 3,700 ft. **Access:** 2-mi. road from Conconully. **Prop:** 13 patented claims. **Owner:** Sunny Peak Mining Co., Spokane, Wash. (1948—). Richard Malone and George Gubser (1892). Mineral Hill Mining Co. (1906-1909). Lone Star Consolidated Mining Co. (1929). Central Mining & Milling Co. (1939). **Ore:** Silver, gold, lead, zinc, copper. **Ore min:** Galena, sphalerite, pyrite, chalcopyrite, tetrahedrite, molybdenite. **Gangue:** Quartz, sericite. **Deposit:** Quartz veins in granite. 2 parallel veins cut by lower adit are each 11 ft. wide. Upper workings expose 2 veins, one 12 in. wide, the other 6 to 36 in. wide. **Dev:** 800-ft. lower adit and an upper adit with more than 2,000 ft. of development. **Assays:** Vein said to carry \$5.60 Au. One assay showed 60 oz. Ag, 15% Pb. **Prod:** Produced flotation conc. in 1938-1939. **Ref:** 12, p. 61. 13, p. 96. 33, 1907, p. 798; 1908, p. 950. 46, pp. 211-212. 75, pp. 27-28. 97, 1938, p. 490; 1940, p. 478. 105, 1/04, p. 70; 1906, p. 229. 106, 12/3/28, p. 19; 8/2/29. 114, no. 5, 1909, p. 82.

Minnehaha (138)

Loc: Sec. 31, (36-25E), an extension of the Homestake property, Conconully dist. **Elev:** 1,500 ft. above Salmon R. **Owner:** George Cooper and T. A. Wilson (1892). **Ore:** Silver, lead, gold. **Ore min:** Galena, tetrahedrite, pyrite. **Gangue:** Quartz. **De-**

posit: A 17-ft. vein carries several rich paystreaks. **Dev:** 200-ft. crosscut. **Assays:** 12½% to 14% Pb, 98 to 113 oz. Ag, tr. Au. **Ref:** 13, p. 92.

Minnie (35)

(see under gold)

Modoc (212)

(see under copper)

Mohawk

(see under lead)

Mohawk

(see under zinc)

Molly (12)

(see under copper)

Molly (Sheep Mountain)

(see Sheep Mountain under molybdenum)

Molson

(see Poland China under gold)

Moncosilgo (86)

(see under copper)

Moneymaker (193)

Loc: Near SW. cor. sec. 26, (34-31E), Park City dist. **Ore:** Silver, gold. **Gangue:** Quartz, manganese oxides. **Deposit:** Zone of sheared silicified granite in which are 2 or more streaks of vesicular iron-stained quartz from 1 to 3 or 4 ft. wide. **Dev:** Large open pit 15 ft. deep. **Assays:** Sample from one of the streaks assayed 2.72 oz. Ag. **Ref:** 122, p. 101.

Monitor (140)

(see under lead)

Montana (219)

Loc: NW¼ sec. 35, (31-30E), ¼ mi. SE. of Little Chief. **Access:** 3 mi. SW. of Nespelem by good gravel road. **Prop:** 1 claim: Montana. **Owner:** May be part of Nespelem Consolidated Mines, Inc. holdings. **Ore:** Silver, gold. **Ore min:** Ruby silver, pyrite. **Gangue:** Quartz, sericitized granite. **Deposit:** Vein contains a few specks of the ore minerals. **Dev:** Shaft, flooded 1918. **Ref:** 58, p. 45. 122, p. 75.

Monterey (177)

(see under copper)

Montgomery

(see Tonasket under copper)

Mother Lode

(see Crystal Butte under gold)

Mountain Beaver (6)

(see under gold)

Mountain Boy (199)

(see under lead)

Mountain Sheep (56)

Loc: Secs. 21 and 28, (40-25E), ¾ mi. N. of Ruby mine, Nighthawk dist. **Access:** Railroad and county road cross the property. **Prop:** 7 patented claims: Mountain Sheep, Boston Boy, Good Hope, Yellow Jacket, Los Amigos, Portal, Mecca; also an unpatented claim and 2 millsites. **Owner:** Joe S. Wilson (1954). G. A. Teele, Nighthawk, Wash. (1934). **Ore:** Silver. **Deposit:** On same fault as and similar to Ruby deposit. Vein can be traced for 3,000 ft. along the outcrop. **Dev:** 3 adits totaling about 2,000 ft. **Assays:** Samples from upper adit showed tr. to 0.04 oz. Au, 99.8 oz. Ag. **Prod:** Few cars of ore prior to 1911. **Ref:** 104, 6/15/34, p. 29. 113, 7/34, p. 15. 154, p. 95.

Mule Deer

(see under gold)

Multnomah (213)

(see under copper)

Myrtle

(see St. Paul)

Nevada (157)

(see also Peacock)

Loc: NE¼ sec. 30, (35-25E), W. of Reservoir Cr. on SE. flank of Peacock Mtn., Ruby dist. **Elev:** 2,900 ft. **Access:** 1 mi. NW. of town of Ruby by road. **Prop:** 1 claim of Peacock group. **Owner:** Peacock Mining & Milling Co. (1917). **Ore:** Silver, lead, copper. **Ore min:** Galena, tetrahedrite, pyrite, chalcocopyrite, sphalerite, stromeyerite. **Gangue:** Quartz. **Deposit:** Vein about 8 ft. wide, with granite footwall and gneiss-schist hanging wall, contains paystreaks as much as 1 ft. wide. **Dev:** 216-ft. shaft, 1,300-ft. adit with drifts on the 40- and 100-ft. levels. **Assays:** Carload shipped av. \$27 per ton, \$10 of which was in Ag and Pb. **Prod:** A carload of ore reportedly shipped about 1900. **Ref:** 12, pp. 61-62. 75, p. 30. 98, 1925, p. 1827. 112, p. 197.

New Deal

(see Antimony Queen under antimony)

New Hope (8)

(see under copper)

New London

(see Methow under gold)

Nighthawk (72)

(see under lead)

Nina Lu (220)

Loc: Sec. 26, (31-30E). **Owner:** E. E. Latourette, Portland, Oreg. **Ore:** Silver, gold, copper. **Ref:** 158.

Nip and Tuck (178)

(see under copper)

North Star (28)

(see under gold)

Northern Gold

(see Bodie under gold)

Number One (73)

(see under lead)

O. K. (85)

(see under copper)

Occident (94)

(see under gold)

Oceanic

(see under gold)

Okanogan Belle (137)

Loc: Sec. 30, (36-25E), northern extension of the Evening Star claim, Conconully dist. **Owner:** F. S. Hines, Tacoma, Wash. (1892). **Ore:** Silver, lead. **Ore min:** Galena, pyrite, argentite. **Gangue:** Quartz. **Deposit:** 13-ft. vein. **Dev:** 150-ft. crosscut. **Assays:** Assays from crosscut and dump show 10% Pb, 92 to 95 oz. Ag. **Ref:** 12, p. 61. 13, p. 93.

Okanogan Free Gold (87)

(see under gold)

Oriental & Central

(see American Flag under gold)

Oro Fino

(see under gold)

Oversight (239)

(see under lead)

Overtop

(see Poland China under gold)

Owasco

(see Okanogan Free Gold under gold)

Palmer Mountain Tunnel (115)

(see under gold)

Panama (240)

Loc: Secs. 24 and 27, (31-30E), 4 mi. W. of Nespelem. **Elev:** 1,000 ft. above Columbia R. **Prop:** 5 unpatented claims: Foresight, Coulee Fraction, Jessie N., Panama, Panama Fraction. **Owner:** Grand Coulee Mines, Inc. (1937-1939). Reserve Silver Mining Co. (1919-1922). Panama Silver Mining Co. (1921-1924). **Ore:** Silver, gold. **Ore min:** Stephanite, argentite, native silver, pyrite, a little chalcopryrite. **Deposit:** Quartz veins along fracture zones in altered granite. Main zone is about 4 ft. wide and carries an 8-in. quartz vein. **Dev:** 30-ft. crosscut, 30-ft. drift, and 35-ft. stope on upper level. 170-ft. crosscut and 100-ft. drift on middle level connected by raise and stope to upper level. Lower level has 155-ft. crosscut and 220 ft. of drifts. **Assays:** 12 tons of handpicked ore returned 56.83 oz. Ag, 0.32 oz. Au in 1919. 13 tons in 1936 av. \$40 per ton. **Prod:** 12 tons in 1919, 1¼ tons in 1921, 13 tons in 1936. **Ref:** 97, 1919, 1921, 1923. 98, 1918-1925. 104, 2/28/34; 6/15/35, p. 27. 116, no. 2, 1911, pp. 40-41. 129, pp. 209-211. 141, p. 22. 158.

Par Value (221)

Loc: NW¼ sec. 35, (31-30E), adjoining Little Chief Mine on SE. **Access:** 3 mi. by good gravel road SW. of Nespelem. **Prop:** May be included in the present Little Chief claims. **Ore:** Silver. **Ore min:** Pyrite, argentite, pyrargyrite, cerargyrite. **Deposit:** Believed to be an extension of the Little Chief lode though not so well mineralized. **Dev:** 68-ft. shaft. **Ref:** 122, p. 75.

Parallel

(see under gold)

Park and Central (200)

(see under lead)

Pateros

(see Sullivan under gold)

Pay Day (25)

(see under gold)

Peacock (150)

(see also Blue Grouse, Republic under lead, Nevada under silver, Wyoming under copper)

Loc: Sec. 19, (35-25E), on summit of McDonald Peak, Conconully dist. **Prop:** Nevada, Blue Grouse, Republic, Wyoming, and other claims. **Owner:** Conconully Mines, Inc., Yakima, Wash. (1954—). Peacock Mining & Milling Co. (1917-1924). Peacock Mining Co. (1949). **Ore:** Silver, gold, copper, lead, zinc. **Ore min:** Galena, tetrahedrite, chalcopryrite, sphalerite, pyrrhotite, pyrite. **Gangue:** Quartz, sericite. **Deposit:** Quartz veins along contact between quartz diorite and metamorphics. **Dev:** 170-ft. crosscut. **Assays:** Cu, 0.5% and 0.8%; Pb, 2.2% and 18%; Ag, 10.4 and 19.2 oz. (2 samples from shaft). **Prod:** Has produced. **Ref:** 12, p. 53. 13, pp. 82-83. 46, pp. 204-206. 68, p. 15. 75, pp. 29-31. 97, 1923, p. 413; 1924, p. 293; 1926, p. 467. 141, p. 22.

Peacock (Bornite) (2)

(see under copper)

Pendennis (170)

(see under gold)

Pennsylvania**Loc:** Nighthawk dist. **Ore:** Silver, gold. **Ref:** 63, p. 102.**Peoria (32)**

(see under gold)

Phil Sheridan

(see Sheridan)

Pinnacle (102)

(see under gold)

Pittsburg (231)

Loc: SE¼ sec. 21, (31-30E), about ½ mi. W. of the Gould & Curry property, Nespelem dist. **Owner:** William Barnard and E. Christianson (1939). **Ore:** Silver, lead. **Ore min:** Pyrite, galena, chalcopryrite, malachite. **Deposit:** Ore in fractures in highly silicified and altered granite. Good-sized silver-lead ore body reportedly exposed. **Dev:** Open pits and steeply inclined shaft. **Prod:** 1914. **Ref:** 97, 1914, p. 651. 122, p. 77. 158.

Plant-Callahan (158)

Loc: Near NE. cor. sec. 32, (35-25E), on steep hillside 1 mi. SE. of Ruby. **Elev:** 2,000 ft. **Prop:** Several claims. **Ore:** Silver, copper. **Ore min:** Tetrahedrite. **Deposit:** Mineralization occurs in stringers and bunches of quartz in a shear zone in biotite schist. The stringers and bunches range from mere seams to masses several feet across. **Dev:** 65-ft. adit, 175-ft. adit, open cuts, shallow shaft. **Assays:** Selected samples assayed as high as \$1,000 Ag. **Prod:** Reportedly a small shipment of rich silver ore in 1886 yielded \$6,000. **Ref:** 75, p. 31.

Pointer

Loc: On Mineral Hill, Conconully dist. **Ore:** Silver. **Dev:** 150-ft. adit. **Ref:** 63, p. 94.

Poland China (166)

(see under gold)

Poorman

(see under lead)

Prize (65)

(see under lead)

Pthomigan

(see under cobalt)

Pyrargyrite

(see Ruby)

Q. S. (123)

(see under copper)

Rainbow (112)

(see under gold)

Ramore (208)

(see under lead)

Ramsey (210)

(see under copper)

Rattlesnake (31)

(see under gold)

Rebecca (243)

(see under copper)

Reco (171)

(see under gold)

Red Bird (216)

(see under copper)

Red Jacket (116)

(see under gold)

Red Shirt (33)

(see under gold)

Reedy

(see Antimony Queen under antimony)

Republic (159)

(see under lead)

Rich Bar (79)

(see under copper)

Riverside

(see under gold)

Rock House

(see under gold)

Roosevelt (179)

(see under iron)

Ruby (Pyrargyrite) (62)

Loc: SE $\frac{1}{4}$ sec. 28, (40-25E), on W. side of the valley, Nighthawk dist. **Elev:** 2,000 ft. **Access:** 4 mi. by road N. of the N. end of Palmer Lk. **Prop:** 5 claims: Crescent, Beggars Choice, Labyrinth, Mystic Shrine, Hide and Seek. **Owner:** Nighthawk Mines, Inc. (1941). Ruby Mining Co. (1905-1918). Pyrargyrite Mining Co. (1918-1926). Chloride Mining Co. (1929-1934). **Ore:** Silver, lead, gold, copper, zinc. **Ore min:** Pyrite, chalcopyrite, arsenopyrite, galena, sphalerite, proustite, pyrargyrite, argentite, free gold, malachite, azurite, limonite. **Gangue:** Quartz, calcite, gouge. **Deposit:** Vein from a few in. to 6 ft. wide in gabbro or granodiorite partially fills a gouge-lined fault zone. Veins tend to pinch and swell. **Dev:** 6,000 ft., 1,300 ft. of which is in adits and the remainder in drifts, raises, and crosscuts. **Assays:** Av. of high-grade ore taken from dump 0.01 oz. Au, 92.1 oz. Ag. Payshoot ore av. \$10 to \$15, high-grade av. \$60. Main values in Ag. **Prod:** \$25,000 in 1915-1920, 1922-1923, 1939. **Ref:** 33, 1907, p. 987. 46, pp. 224-225. 58, p. 48. 97, 1905, 1908, 1910, 1917, 1921-1923, 1935, 1940. 98, 1918-1926. 104, 5/15/32, pp. 25-26; 3/30/34, p. 25. 105, 2/4/05, p. 78; 2/18/05, p. 111; 1/06, p. 46; vol. 92, 1906, p. 46; vol. 124, 1922. 106, 8/2/29. 112, p. 197. 129, pp. 237-240. 130, p. 87. 141, pp. 20, 22, 51. 154, pp. 94-95. 158.

Ruby

Loc: On Ruby Mtn. **Elev:** 3,000 ft. **Access:** Wagon road from main county road. **Owner:** Thomas Donan, John Clunan, William Milliken, and Jonathan Bourne (1890). **Ore:** Silver, gold, copper. **Ore min:** Pyrargyrite, cuprite, native silver, malachite. **Deposit:** Quartz vein 6 to 18 ft. wide in which are high-grade shoots of ore. One shoot was 2 ft. wide. **Dev:** 60-ft. shaft with 30-ft. crosscut, 50-ft. adit. **Assays:** Assay on the 2-ft. shoot gave \$320 Au, Ag. **Prod:** 1937. **Ref:** 12, pp. 50-51. 97, 1938, p. 459.

Ruby Silver

Loc: Nespelem dist. **Owner:** C. H. Beggs and Gus Mitchen, Nespelem, Wash. **Ore:** Silver, gold. **Ore min:** Galena, stephanite, argentite. **Deposit:** Ore in quartz along fault planes and fractures in granite. **Assays:** 0.02 to 0.07 oz. Au, 57.35 to 612.2 oz. Ag. **Prod:** 1915-1919. **Ref:** 158.

Rush (63)

(see under gold)

Russia

(see under copper)

Safe Deposit

(see under copper)

Saint (80)

(see under gold)

St. Anthony (41)

(see under gold)

St. Lawrence

(see under gold)

St. Paul (Hilo, Myrtle) (241)

Loc: E $\frac{1}{2}$ NE $\frac{1}{4}$ sec. 27, (31-30E), 2 $\frac{1}{2}$ mi. W. of Nespelem. **Access:** Truck road. **Prop:** 6 unpatented claims: Hilo Nos. 1 and 2, St. Paul, Fourth of July, Manganese, Boundary. **Owner:** Elmer Seeley, Nespelem, Wash., leasing to S. J. Pooley, Elmira, Wash. (1939). **Ore:** Gold, silver, manganese. **Ore min:** Rhodochrosite, galena, chalcopyrite, pyrite, bornite, argentite. **Gangue:** Quartz. **Deposit:** A mixture of quartz and rhodochrosite occurs along shear zones in decomposed granite. One such zone is 4 ft. wide. Stringers of ore minerals are narrow and short. **Dev:** 700 ft. of shaft and adit. **Assays:** One portion of the shear zone said to run \$6 in Ag. **Ref:** 43, vol. 105, p. 1082. 130, p. 79. 141, p. 86. 158.

Salmon River (139)

Loc: SW $\frac{1}{4}$ sec. 31, (36-25E), on E. side of Salmon R. $\frac{1}{4}$ mi. SE. of Tough Nut property. **Elev:** 3,000 ft. **Access:** North of Conconully by road. **Prop:** 5 claims: Salmon River Chief, Knickerbocker, Salmon Creek, Wellington, Manhattan. **Owner:** Henry Wellington (1892). **Ore:** Silver, lead, gold, copper, zinc. **Ore min:** Galena, argentite, tetrahedrite, arsenopyrite, sphalerite, chalcopyrite, pyrite. **Gangue:** Quartz. **Deposit:** Veins in sandy mica schist. A 3-ft. vein with a 12-in. paystreak, a 1- to 4-ft. vein, a 3-ft. vein, a 5-ft. vein with 18-in. paystreak, and a 4-ft. vein. **Dev:** 150-ft. crosscut with 500 ft. of drifts, 20-ft. adit, 20-ft. crosscut, 30-ft. adit. **Assays:** Tr. to 4 oz. Au, 36 to 83 oz. Ag, 6% to 20% Pb. **Ref:** 12, pp. 56-58. 13, pp. 90-92. 46, p. 203. 75, p. 26.

San Marino (222)

(see under gold)

Schulz and Chesney (53)

(see under gold)

Seven Devils

(see Mineral Hill)

Sharp

(see Silver King under copper)

Sharp and Balthus (201)

(see under zinc)

Shaw-Bergman

(see under copper)

Sheep Mountain (1)

(see under molybdenum)

Shelby

Loc: On W. side of Peacock Hill, Ruby dist. **Prop:** 1 claim. **Owner:** J. P. Fogarty, Edward Pryun, and William Stedman (1892). **Ore:** Silver, lead, gold. **Ore min:** Galena, arsenopyrite. **Gangue:** Quartz. **Deposit:** 6-ft. vein. **Dev:** 75-ft. inclined shaft. **Assays:** 29 to 140 oz. Ag, 0.5% to 5% Pb, tr. Au. **Ref:** 13, p. 85.

Sheridan (Phil Sheridan) (187)

Loc: SW $\frac{1}{4}$ sec. 24, (38-31E), in small gulch 1 mi. N. of the E. Fk. of Toroda Cr., Sheridan dist. **Access:** About 4 mi. E. of the old town of Toroda by road. **Prop:** 10 patented claims. **Owner:** A. C. Perrott, Oroville, Wash. (1951—). Carey Mining & Milling Co. (1915-1919). Carey Mining & Development Co. (1916-1921). J. P. McCormick (1921). Blue Stern Mining Co. (1921-1926). **Ore:** Silver, gold, lead, copper. **Gangue:** Quartz, calcite. **Deposit:** A 1- to 7-ft. shear zone in phonolite consists of brecciated country rock cemented by quartz and calcite. No visible ore minerals; assays necessary to determine

ore. **Dev:** A series of crosscuts over a distance of 500 ft. up the hillside, also a 200-ft. winze, a lower 190-ft. adit, a 300-ft. adit, a 168-ft. adit with a 390-ft. drift, a 300-ft. shaft. **Assays:** Several carloads of conc. av. 300 oz. Ag. Mill feed av. 15 oz. Ag. Ore shipped av. \$40 per ton, chiefly in Ag. **Prod:** Several carloads of conc. about 1918. Produced 1910-1919 (est. between \$60,000 and \$100,000). **Ref:** 97, 1910-1919. 98, 1922-1926. 129, pp. 194-196.

Sherman (165)
(see under lead)

Sidewinder
(see under gold)

Silent Friend (95)
Loc: SE $\frac{1}{4}$ sec. 10, (39-26E), E. of the Spokane claim, Wanacut Lk. dist. **Prop:** 1 claim. **Ore:** Silver, gold. **Ore min:** Pyrite. **Gangue:** Quartz. **Deposit:** Said to be a large vein. **Dev:** 30-ft. shaft. **Assays:** Assays from outcrop gave \$10 Ag, Au. **Ref:** 13, p. 105.

Silver Bell (190)
(see under gold)

Silver Belle
Loc: Galena area. **Prop:** 4 claims: Silver Belle, Silver Side, Gussie Everett, Kismet. **Owner:** Ben R. Everett and W. H. Cogswell, Tacoma, Wash. (1892). **Ore:** Silver, copper. **Ore min:** Chalcocite, argentite. **Deposit:** Quartz vein 2 $\frac{1}{2}$ ft. wide. **Ref:** 13, p. 111.

Silver Bluff
Loc: Galena area. **Prop:** 1 claim. **Owner:** Montana & Washington Mining & Milling Co. (1922-1926). H. McCartney and the Chilson brothers (1892). **Ore:** Silver, copper, gold. **Ore min:** Argentite, chalcocite. **Gangue:** Quartz. **Deposit:** Vein 2 ft. wide on surface. **Dev:** 65-ft. inclined shaft. **Assays:** Tr. Au, 97 to 110 oz. Ag, 2.9% to 3.5% Cu. **Prod:** Credited with \$80,000 to end of 1923. **Ref:** 13, p. 112. 97, 1925, p. 559. 98, 1925, p. 1828; 1926, p. 1588.

Silver Cliff (242)
Loc: Sec. 17, (30-31E). **Access:** 5 mi. by road SSE. of Nespelem. **Ore:** Silver, lead. **Ore min:** Pyrite, galena, chalcopryrite. **Gangue:** Quartz, sericite, rhodochrosite. **Deposit:** 2 main lodes, one 2 to 36 in. wide, the other 4 to 18 in. wide, consist of quartz replacements of sericitized granite. The granite is sparsely mineralized. **Dev:** 3 adits, 110, 75, and 200 ft. long. **Prod:** Carload of ore said to have been shipped. **Ref:** 58, p. 63. 122, pp. 75-76.

Silver King (Sharp) (19)
(see under copper)

Silver King (Bunker Hill) (141)
(see under lead)

Silver Ledge (37)
(see under gold)

Silver Mountain (Silver Star) (120)
Loc: W $\frac{1}{2}$ sec. 34, (38-26E) and NW $\frac{1}{4}$ sec. 3, (37-26E), Tonasket area. **Access:** Road to mine. **Owner:** Silver Mountain Mining Co., Inc., Tacoma, Wash. (1951—). Silver-Lead Mining & Reduction Co. (1928-1936). Lucky Lady, Inc. (1936). **Ore:** Silver, lead, zinc, gold. **Ore min:** Pyrite, galena, sphalerite. **Deposit:** Quartz veins and silicified zones 1 to 20 ft. wide in metasediments, sparsely mineralized. **Dev:** 2,000-ft. adit. **Improv:** 400-ton mill under construction (1952). **Assays:** 6 samples showed tr. to \$3.40 Au, Ag. A sample for mill test showed 28.79 oz. Ag, 0.351 oz. Au, 1.11% Pb, 0.59% Zn. **Prod:** 1943. **Ref:** 104, 4/15/36, p. 27. 106, 8/2/28. 133, p. 39. 158.

Silver Queen
(see Lucky Lady)

Silver Seal
(see Antimony Queen under antimony)

Silver Star
Loc: S. extension of the Shelby, on the W. side of Peacock Hill, Ruby dist. **Prop:** 1 claim. **Owner:** B. Dougherty and William Stedman (1892). **Ore:** Silver, lead, gold. **Ore min:** Galena, arsenopyrite. **Gangue:** Quartz. **Deposit:** 4-ft. vein. **Dev:** 75-ft. inclined shaft. **Ref:** 13, p. 85. 158.

Silver Star (121)
(see Silver Mountain)

Six Eagles
(see Little Chopaka under lead)

Snow Cap
(see Iron Cap and Snow Cap under gold)

Snowshoe (202)
(see under lead)

Sonny Boy (163)
Loc: NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 6, (34-25E), about $\frac{3}{4}$ mi. N. of the Arlington mine. **Access:** Road from Conconully. **Prop:** Several unpatented claims. **Owner:** Ruby Mountain Mining Co., Tacoma, Wash. (1939-1940). **Ore:** Silver, lead, copper, gold. **Ore min:** Pyrite and minor amounts of galena, chalcopryrite, tetrahedrite, and sphalerite. **Deposit:** 2 mineralized quartz veins near the contact of granite with schist. One vein 6 to 8 in. wide, the other 6 in. to 6 ft. wide. Wide vein traceable for 70 ft. **Dev:** 600-ft. adit with some 300 ft. of drifts and raises, and a 100-ft. adit. **Assays:** 150 to 200 oz. Ag. **Prod:** 1939, 1940. **Ref:** 22, p. 10. 97, 1940, p. 478; 1941, p. 474. 158.

Spokane (27)
(see under gold)

Spokane (American Rand) (91)
(see under gold)

Standard
(see Sherman under lead)

Standard and Louisa (48)
(see under gold)

Star
(see Lone Star under lead)

Stemwinder (188)
Loc: NW $\frac{1}{4}$ sec. 24, (38-31E), Wauconda dist. **Ore:** Silver. **Ref:** 99, 2/12/35. 104, 1/30/35, p. 24; 4/30/35, p. 29.

Sterling (226)
Loc: Sec. 8, (31-30E), Nespelem dist. **Ore:** Silver. **Ref:** 58, p. 65.

Stone
(see Kelsey under copper)

Submarine
(see Lone Pine)

Sullivan
(see under gold)

Summit (74)
Loc: Sec. 14, (40-25E), adjoining Little Chopaka group on the S., Nighthawk dist. **Prop:** 1 claim. **Ore:** Silver, lead, gold, copper. **Ore min:** Pyrite, galena, some chalcopryrite, a little sphalerite, scattered molybdenite. **Gangue:** Quartz, sericite. **Deposit:** 3 $\frac{1}{2}$ -ft. quartz vein in granite. **Dev:** 70-ft. inclined shaft. **Assays:** 5 to 7 oz. Ag, with minor values in Pb and Au. **Ref:** 63, pp. 103-104. 129, p. 231. 154, p. 91. 158.

Summit (114)

(see under gold)

Summit (203)

(see under lead)

Sunnyside

(see under gold)

Sunrise

Loc: On Mineral Hill, Conconully dist. **Elev:** 5,200 ft. **Prop:** 1 claim. **Owner:** John C. Collins and Newton Campbell (1892). **Ore:** Silver, copper, antimony. **Ore min:** Stephanite, tetrahedrite, argentite. **Gangue:** Quartz. **Deposit:** 4-ft. vein with a 14-in. paystreak. **Dev:** 75-ft. drift. **Assays:** Av. samples from the paystreak said to assay 379 oz. Ag. Samples across the vein assayed 120 oz. Ag. **Ref:** 12, p. 60. 13, p. 97.

Sunshine

(see Hidden Treasure under gold)

Sunshine Chief

(see Chief Sunshine)

Surprise (223)

Loc: E½SW¼ sec. 35, (31-30E), ¾ mi. SE. of Little Chief property. **Access:** 3 mi. SW. of Nespelem by good gravel road. **Prop:** 1 claim: Surprise. **Owner:** May be part of Nespelem Consolidated Mines, Inc. holdings. **Ore:** Silver, gold. **Gangue:** Dump contains sericitized granite and iron-stained vein quartz. **Assays:** Sample from selected portion of dump assayed 0.03 oz. Au, 31.6 oz. Ag. **Ref:** 122, p. 75.

Teddy Roosevelt

(see Roosevelt under iron)

Thomas

(see Hill-Thomas)

Three Links

(see under gold)

Three L's (204)

(see under lead)

Tom Hal

(see Friday under gold)

Tonasket (125)

(see under copper)

Tough Nut (142)

Loc: NW¼ sec. 31, (36-25E), on E. side of Salmon R., N. of Key property. **Access:** 1½ mi. by road N. of Conconully. **Prop:** 3 claims. **Owner:** Salmon River Mining & Smelting Co. (1902-1915). **Ore:** Silver, lead, copper, zinc. **Ore min:** Galena, pyrite, chalcopyrite, sphalerite. **Deposit:** 3- to 10-ft. vein in sandy-textured quartz-mica. **Dev:** Adit said to be 250 ft. long, and 40-ft. winze on the vein. **Assays:** 500 tons of ore had est. value of \$9,000 in Ag and Pb. **Prod:** Est. \$9,000 prior to 1916. Small amount in 1939. **Ref:** 12, pp. 55-56. 13, p. 89. 46, pp. 209-210. 63, p. 93. 75, p. 25. 88, p. 33.

Triangle

(see Hidden Treasure under gold)

Trinidad

(see Central)

Trinity (89)

(see under gold)

Triune (96)

(see under gold)

Twin Pine (214)

(see under zinc)

Twisp View (29)

(see under gold)

Uncle Sam

Loc: Wannacut Lk. dist. **Ore:** Silver, lead, gold. **Ref:** 63, p. 101.

Utica (118)

(see under gold)

Valley View (14)

(see under gold)

Virginia

(see under gold)

War Eagle (104)

(see under gold)

War Eagle

Loc: W. of the Ruby mine, 1½ mi. from old town of Ruby. **Owner:** War Eagle Mining & Milling Co. **Ore:** Silver, gold, copper, lead. **Deposit:** 9-ft. vein of milling ore with a paystreak 2 ft. wide. **Dev:** Two 100-ft. shafts connected at bottoms, surface stripping. **Assays:** Assays from dump yielded 65 oz. Ag, tr. Au, some Cu, tr. to 10% Pb. **Ref:** 12, p. 51. 13, p. 84.

Warsaw

(see under gold)

Wasco (194)

Loc: Near center S½ sec. 9, (33-31E), Park City dist. **Elev:** 3,900 ft. **Prop:** Several claims. **Owner:** May be property held by West King Mining Co. **Ore:** Silver, copper, gold, lead, zinc, molybdenum. **Ore min:** Galena, sphalerite, chalcopyrite, pyrite, tetrahedrite, molybdenite, molybdite, malachite, azurite. **Gangue:** Quartz, fluorite. **Deposit:** 3 sparsely mineralized quartz veins, 12 in., 24 in., and 36 in. wide, in granite and along its contact with schist. Molybdenite occurs in granite dikes. **Dev:** Shallow shaft, several small surface cuts, 400-ft. adit. **Assays:** Ores said to contain appreciable quantities of Ag and Cu and some Au. **Ref:** 7, pp. 209-210. 46, pp. 178-179. 122, pp. 100-101.

Washington

Loc: Nighthawk dist. **Prop:** 4 claims: Diana, Enterprise, Olympia, Highland. **Owner:** Washington Mining Co. (1892). **Ore:** Silver, lead. **Deposit:** 4 veins. **Assays:** Assays on the 4 veins gave \$30 to \$220 per ton. **Ref:** 12, p. 67. 13, p. 109.

Washington Consolidated

(see Mineral Hill)

Wehe (110)

(see under gold)

West King

Loc: Park City dist., 35 mi. from Republic. **Prop:** 3 claims. **Owner:** West King Mining Co. (1941). **Ore:** Silver, lead, zinc. **Deposit:** Vein in granite. **Dev:** 384-ft. adit, 2 open cuts. **Assays:** Av. value of \$15 per ton, mostly in Ag. **Ref:** 46, p. 177.

Western Star (180)

(see under copper)

Whitestone (185)

(see under gold)

Windfall

Loc: Twisp dist. **Owner:** Hill Thomas (1890). **Ore:** Silver, gold, antimony. **Ore min:** Stephanite, cerargyrite. **Gangue:** Quartz. **Deposit:** A 3-ft. vein carries 13 in. of ore. **Dev:** 60-ft. shaft. **Assays:** Assays show tr. Au, 118 to 325 oz. Ag. **Ref:** 12, pp. 68-69. 13, p. 115.

Wolverine (26)
(see under gold)

Woo Loo Moo Loo (164)

Loc: Sec. 5, (34-25E), Conconully dist. **Ore:** Silver, lead, copper. **Ref:** 58, p. 73. 63, p. 93.

Wyandotte (59)
(see under gold)

Wyoming (160)
(see under copper)

Yakima (172)
(see under copper)

Yellow Girl
(see under copper)

PEND OREILLE COUNTY

Ace High (19)

Loc: Sec. 33, (39-45E), Metaline dist. **Access:** 3 mi. over difficult terrain from road. **Prop:** 2 unpatented claims. **Owner:** Jack Doyle, Metaline Falls, Wash. (1941). **Ore:** Silver, gold, copper. **Gangue:** Quartz. **Deposit:** Fracture zone impregnated with mineralized quartz has been exposed to a width of about 80 ft. **Dev:** Numerous open cuts and surface stripping. **Assays:** Handpicked sample said to have assayed \$65 per ton. **Ref:** 29, p. 38.

D. Aldrich
(see Lead King under lead)

Alger and McCullough (43)
(see under copper)

American Zinc, Lead and Smelting Co.
(see under zinc)

Baker City (49)

Loc: Sec. 15, (32-45E), Newport dist. **Prop:** 1 unpatented claim. **Owner:** Abandoned (1941). **Ore:** Silver, lead, copper. **Deposit:** Said to be mineralized quartz veins. **Dev:** Workings caved. (1941). **Ref:** 29, p. 65.

Barefoot (40)

Loc: Secs. 2 and 11, (37-41E), Metaline dist. **Access:** 800 ft. from road. **Prop:** 4 unpatented claims. **Owner:** F. P. La Sota and associates, Metaline Falls, Wash. (1941). **Ore:** Silver, lead, zinc. **Deposit:** A 2-ft. quartz vein on a granite contact has reportedly been traced for 2,000 ft. **Dev:** A 20-ft. shaft and numerous open cuts. **Ref:** 29, p. 37.

Bead Lake (55)
(see under lead)

Bella May (32)
(see under zinc)

Berkin
(see Wolf Creek under lead)

Best Chance
(see Rainbow under copper)

Blazing Star
(see under gold)

Blue Bucket (34)
(see under zinc)

Blue Jim (West) (36)

Loc: Center W½ sec. 17, (38-43E), on E. bank of Pend Oreille R., Metaline dist. **Access:** Road. **Prop:** 1 unpatented claim. **Owner:** C. N. West and associates, Metaline Falls, Wash. (1945—). **Ore:** Silver, copper, gold, lead, zinc. **Ore min:**

Tennantite, malachite, siderite, chalcocopyrite, galena, sphalerite, pyrite, chalcocite. **Deposit:** Zone in limestone is laced with mineralized quartz veinlets over a width of 7 to 20 ft. for an exposed length of 200 ft. **Dev:** 40-ft. adit, 400-ft. adit, 4 open cuts. **Ref:** 29, p. 43. 114, no. 5, 1909, p. 54. 158.

Bromide
(see La Sota)

Buck (62)

Loc: Sec. 28, (31-45E), Newport dist. **Access:** Near road. **Prop:** Several unpatented claims. **Owner:** Abandoned (1941). **Ore:** Silver. **Deposit:** Said to be mineralized quartz stringers. **Dev:** Caved shaft. **Ref:** 29, p. 73.

Bunker Hill
(see Lead Hill under zinc)

Campbell (57)
(see under copper)

Champagne-Hoosier
(see Hoosier under copper)

Clark
(see Josephine under zinc)

Cliff (1)
(see under zinc)

Comstock (54)
(see under lead)

Conquest
(see Kootenai Conquest under lead)

Copper Queen (3)
(see under copper)

Corzine (38)
(see under lead)

Cougar (20)
(see under copper)

Dan Fieldner
Loc: Newport dist. **Ore:** Silver, lead. **Assays:** \$66 Ag, Pb (1925). **Prod:** 1925. **Ref:** 98, 1925, p. 1813.

Deemer (17)
(see under gold)

Eagle
(see Ries under lead)

Elliot (23)
(see under lead)

Eureka (12)
(see under zinc)

Fairview Copper
(see Skippy and Queen Bess under lead)

Fissure
Loc: Metaline dist. **Owner:** T. T. Richardson, Northport Wash. **Ore:** Silver, copper, gold, cobalt. **Ref:** 158.

Flusey
(see Flusey-Hoopala under lead)

Flusey-Hoopala (6)
(see under lead)

Flying Squirrel
(see Giant-Flying Squirrel under zinc)

Galena Hill
(see Whoopie-Galena Hill under zinc)

General MacArthur (60)

(see under lead)

Giant-Flying Squirrel (2)

(see under zinc)

Glass

(see General MacArthur under lead)

Gold Arrow

(see Ries under lead)

Gold Coin-Hardtack (Snyder) (50)

Loc: NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 15, (32-45E), Newport dist. **Access:** Road. **Prop:** 2 unpatented claims, 160 acres deeded land. **Owner:** E. E. Snyder, Newport, Wash. (1941). Once part of Hoover Mining Co. holdings. **Ore:** Silver, lead, copper, gold. **Deposit:** Irregular quartz stringers said to carry small values. **Dev:** 80-ft. adit, caved (1948), open cuts. **Ref:** 29, pp. 66, 71, 139, pp. 54-55.

Golden Anchor

(see Ries under lead)

Grandview (Reuther) (16)

Loc: Sec. 25, (40-45E), Metaline dist. **Access:** 3 mi. by trail from good road. **Prop:** Several claims. **Owner:** Emil Reuther, Metaline Falls, Wash. (1941). **Ore:** Silver, copper, gold, nickel. **Deposit:** 2 quartz veins about 8 ft. apart. Veins av. 1 ft. wide and have been exposed for 600 ft. on the surface. **Dev:** Several open cuts. **Ref:** 29, p. 36.

Grandview mine (24)

(see under zinc)

Grandview Mines, Inc.

(see under zinc)

Gray Eagle

(see Hawkeye-Gray Eagle-Last Chance under copper)

Gypsy (18)

(see under copper)

Haliday (11)

(see under lead)

Hanley (4)

(see under zinc)

Hardrock Thomas (46)

(see under copper)

Hardtack

(see Gold Coin-Hardtack)

Hawkeye-Gray Eagle-Last Chance (58)

(see under copper)

Hoosier (28)

(see under copper)

Huffman

(see Mule Deer under lead)

Independence (Star) (52)

Loc: SW $\frac{1}{4}$ sec. 23 and NW $\frac{1}{4}$ sec. 26, (32-45E), Newport dist. **Prop:** 1 unpatented claim. **Owner:** V. P. Campbell (1951). **Ore:** Silver, lead, copper, gold. **Gangue:** Quartz. **Deposit:** Quartz vein 2 ft. wide in diorite. **Dev:** Shaft with drifts totaling about 300 ft., full of water (1950). **Ref:** 29, p. 66. 139, p. 55.

Isabelle (45)

(see under gold)

Jim Creek (37)

(see under lead)

Josephine (26)

(see under zinc)

Katydid

(see Ries under lead)

Key Fraction (51)

(see under lead)

King Tut (15)

(see under lead)

Kootenai Conquest (56)

(see under lead)

Kroll

(see Blue Bucket under zinc)

Lakeview (5)

(see under zinc)

La Sota (Silver Crest, Bromide) (41)

Loc: SE $\frac{1}{4}$ sec. 3 and NE $\frac{1}{4}$ sec. 10, (37-41E), on saddle and flanks of Aladdin Mtn. **Elev:** 4,000 to 4,500 ft. **Access:** 1 mi. by road and 1 $\frac{1}{2}$ mi. by trail from the Meadow Cr. road. 22 mi. from railroad at Colville. **Prop:** 16 unpatented claims. **Owner:** F. P. La Sota and C. Clarke, Metaline Falls, Wash. (1941—). **Ore:** Silver, lead, zinc, copper, reportedly cobalt, gold. **Ore min:** Galena, sphalerite, tetrahedrite, azurite, malachite, horn silver (?), chalcopryrite, bornite, embolite (?). **Gangue:** Quartz, tourmaline. **Deposit:** Narrow mineralized quartz stringers and mineralized limy bands in argillite. One quartz vein is 2 to 6 ft. wide and traceable for 450 ft. **Dev:** 20-ft. winze, 95-ft. drift, 50-ft. winze, 100-ft. crosscut with drifts, 20-ft. drift, numerous open cuts, diamond drill holes. **Assays:** One assay across 3 ft. of vein showed 11.50 oz. Ag, tr. Au. A 4-ft. sample at another place showed 0.04 oz. Au, 0.14 oz. Ag. 15.13% Co reported. **Ref:** 29, pp. 59-60. 133, p. 31. 158.

Last Chance

(see Hawkeye-Gray Eagle-Last Chance under copper)

Lead Hill (14)

(see under zinc)

Lead King (7)

(see under lead)

Little Noisy (39)

(see under zinc)

Lloyd (63)

(see under lead)

McCann (47)

(see under copper)

McCullough

(see Alger and McCullough under copper)

Mammoth

(see Morning and Mammoth under lead)

Metaline Contact (29)

(see under zinc)

Metaline Metals (8)

(see under zinc)

Meteor (53)

(see also Alger and McCullough under copper)

Loc: E $\frac{1}{2}$ NW $\frac{1}{4}$ sec. 22, (32-45E), Newport dist. **Access:** Road. **Prop:** 1 patented claim, part of Alger and McCullough group. **Owner:** Ed Alger, Newport, Wash. **Ore:** Silver, lead, copper. **Ore min:** Galena, chalcopryrite. **Gangue:** Quartz. **Deposit:** 16-in. well-defined quartz vein. **Dev:** 2 short drifts. **Ref:** 73, p. 46. 129, p. 80. 158.

Midas

(see Ries under lead)

Morning and Mammoth (25)

(see under lead)

Mount Pisgah (64)

(see under lead)

Mule Deer (42)

(see under lead)

Nelroe (9)

(see under lead)

Nevell (66)

(see under gold)

O. K. (31)

Loc: NW¼ sec. 31, (39-43E) and E½ sec. 36, (39-42E), Metaline dist. **Elev:** 3,275 to 3,475 ft. **Access:** 4 mi. from old Metaline up Sweet Cr. road. **Prop:** 8 claims: Silver Queen North and South Extensions, O. K. and North Extension, Columbia and North Extension, Ione. **Owner:** Pend Oreille Premier Mining Co. (1930-1942). **Ore:** Silver, lead, zinc, copper, gold. **Ore min:** Tetrahedrite, galena, sphalerite, pyrite, chalcopyrite, pyrrhotite. **Gangue:** Calcite, quartz, tremolite, diopside, tourmaline, garnet. **Deposit:** Contact replacement deposit of limestone. **Dev:** 1,000 ft. of drifts mostly in 2 adits, one has 300 ft. and the other 430 ft. of drifts. **Assays:** Gallium and germanium are present in spectrographically determinable quantities. **Prod:** May have produced. **Ref:** 29, p. 40. 46, p. 36. 73, pp. 70-72. 106, 5/19/30. 128, p. 76. 158.

Oriole (30)

(see under zinc)

Pat (21)

(see under lead)

Pend Oreille Mines & Metals Co.

(see under zinc)

Pindle (67)

(see under copper)

Poorman

Loc: Metaline dist. **Ore:** Silver. **Prod:** 1937. **Ref:** 58, p. 55. 97, 1938, p. 459.

Prouty (22)

Loc: Secs. 29 and 32, (39-44E), Metaline dist. **Access:** Road. **Prop:** 5 unpatented claims. **Owner:** Abandoned (1941). **Ore:** Silver, lead, gold. **Deposit:** Narrow stringers of sparsely mineralized quartz occur in a fracture zone. **Dev:** 250 ft. of adits with caved portals, and some open cuts. **Assays:** Reportedly rich silver samples were found here. **Ref:** 29, p. 52.

Queen Bess

(see Skippy and Queen Bess under lead)

Rainbow (48)

(see under copper)

Reuther

(see Grandview)

Ries (61)

(see under lead)

Riverview (10)

(see under zinc)

Rocky Creek (41A)

Loc: SE. cor. sec. 23, (37-41E). **Access:** About 12 mi. by road from railroad at Tiger. **Prop:** 3 claims. **Owner:** Kaniksu Metals, Tacoma, Wash. (1954—). George and Henry Rushmier and

Mrs. Bellows, Colville, Wash. (1953). **Ore:** Silver, lead, zinc, gold. **Ore min:** Galena, chalcopyrite, sphalerite, free gold. **Deposit:** Fine-grained sulfides in a quartz vein 2 to 16 in. wide exposed for 50 ft. in a schist roof pendant in granite. **Dev:** 10-ft. shaft, 70-ft. drift. **Assays:** Av. 360 oz. Ag. One assay showed 0.44 oz. Au. Some ore carried free gold to the extent of several thousand dollars per ton. **Ref:** 69-A, p. 15. 158.

Silver Crest

(see La Sota)

Skippy and Queen Bess (44)

(see under lead)

Slate Creek

(see Whoopie-Galena Hill under zinc)

Snowbird and Stanley (59)

(see under lead)

Snyder

(see Gold Coin-Hardtack)

Stanley

(see Snowbird and Stanley under lead)

Star (Campbell)

(see Campbell under copper)

Star (Independence)

(see Independence)

Sterling (33)

(see under zinc)

Sunrise (65)

(see under gold)

Velvet Lode

(see King Tut under lead)

Washington (27)

(see under lead)

West

(see Blue Jim)

Whoopie-Galena Hill (13)

(see under zinc)

Wolf Creek (35)

(see under lead)

PIERCE COUNTY

Bear Gap

(see Fife under gold under Yakima County)

Blazing Star

(see under gold)

Blue Bell

(see Fife under gold under Yakima County)

Blue Grouse and Sure Thing (2)

(see under gold)

Blue Star

(see under copper)

Boston

(see under gold)

Current (3)

(see under gold)

Fife (4)

(see under gold under Yakima County)

Frater (5)

(see under gold)

- King**
(see under gold)
- Lone Star**
(see under copper)
- Lorraine**
(see under copper)
- Manitau**
(see Fife under gold under Yakima County)
- Nell**
Loc: Summit dist. Ore: Silver. Ref: 63, p. 45.
- New Deal**
(see Washington Cascade under gold)
- Pick Handle**
(see Fife under gold under Yakima County)
- Silver Creek (6)**
(see under gold)
- Silver Creek Gold & Lead (1)**
(see under gold)
- Sure Thing**
(see Blue Grouse and Sure Thing under gold)
- Tacoma**
(see under copper)
- Washington Cascade (7)**
(see under gold)
- SKAGIT COUNTY**
- Alta (11)**
(see under lead)
- Anacopper (1)**
(see under copper)
- Bornite**
(see North Coast under gold)
- Boston (12)**
(see under lead)
- British**
(see Skagit Queen)
- Bunker Hill and Sullivan**
Loc: Cascade dist. Ore: Silver. Ref: 63, p. 55.
- Cascade (23)**
(see under lead)
- Cascade Minerals**
(see under lead)
- Chicago (13)**
(see under lead)
- Denver**
Loc: S. of Boston property, Cascade dist. Ore: Silver, gold. Ref: 63, p. 55.
- Dorothy**
(see Thunder Creek under lead)
- Eldorado (15)**
Loc: Sec. 15, (35-13E), Cascade dist. Ore: Silver, gold, lead, zinc. Ore min: Galena, sphalerite. Ref: 13, p. 176. 58, p. 20. 63, p. 55. 158.
- Epoch (24)**
(see under lead)
- Everett**
(see Willis and Everett)
- Everett Extension**
Loc: T. 35 N., R. 13 E., Cascade dist. Owner: North Coast Mining & Milling Co. (1908-1934). Ore: Silver, lead, zinc, gold. Ref: 33, 1908, p. 1053. 116, no. 5, 1909, p. 95. 158.
- Fidalgo**
(see Stephens under copper)
- Fidalgo Island (2)**
(see under copper)
- Fourth of July (26)**
Loc: SW¼ sec. 11, (34-13E), Cascade dist. Ore: Silver, gold. Ref: 63, p. 56.
- Friend (16)**
Loc: Sec. 26, (35-13E), Cascade dist. Owner: Adolph Behrens and sons estate (1934). Ore: Silver, lead, zinc, gold. Ref: 158.
- Grand Republic (27)**
(see under lead)
- Granite (22)**
Loc: SW¼ sec. 34, (35-13E), Cascade dist. Ore: Silver, lead. Ref: 63, p. 56.
- Great Northern**
(see under gold)
- Hartford (6)**
(see under lead)
- Iowa-Olympia**
Loc: T. 34 N., R. 13 E., 2 mi. SW. of Cascade Pass on W. slope of Magic Mtn. Ore: Silver, lead, zinc. Deposit: Veins in granite. Ref: 158.
- Johnsburg (21)**
(see under lead)
- Kildare (17)**
(see under lead)
- Lakeside**
(see under lead)
- Logan No. 2 (10)**
Loc: W½ sec. 23, (35-14E), ¼ mi. NW. of Park Cr. Pass. Elev: Slightly lower than Park Cr. Pass. Ore: Silver, lead, zinc, copper, gold. Dev: Adit several hundred feet long. Ref: 158.
- Marine**
(see under gold)
- Michigan (25)**
Loc: NE¼ sec. 3, (34-13E), Cascade dist. Ore: Silver, lead. Ref: 13, p. 143. 63, p. 56.
- Midas (18)**
Loc: W½ sec. 25 and E½ sec. 26, (35-13E), on S. side of N. Fk. of Cascade R., E. of Johnsburg. Elev: 4,200 ft. Prop: 5 patented claims: Midas, Diamond, Saratoga, Pride of Seattle, Pride of Kildare. Owner: A. G. Mosier and William Soren, Sedro Woolley, Wash. (1951). Ore: Silver, lead, zinc, gold, copper. Ore min: Chalcopyrite, pyrite, sphalerite, galena. Deposit: 2 intersecting shear zones contain narrow sulfide-bearing quartz veins. Mineralized portions vary from 7 to 24 in. in width. Dev: Several crosscuts and drifts. Assays: Reportedly \$50 to \$600 in all values. Fair values in silver and moderate to low values in lead, zinc, gold, and copper. Ref: 63, p. 55. 158.
- North Coast (3)**
(see under gold)

Olympia

(see Iowa-Olympia)

Ontario (7)

(see under lead)

Pioneer (28)

Loc: Secs. 1, 2, and 11, (34-13E). **Access:** 6 mi. by trail from Mineral Park up the Middle Fk. of Cascade R. **Prop:** 9 patented claims: Pioneer, Iowa, Olympic, Little Bill, Torpedo, Whistler, P. D., Snowbird, Pole Axe. **Owner:** William Soren, Mount Vernon, Wash. (1943). **Ore:** Silver, zinc, lead. **Deposit:** Quartz vein. **Dev:** Considerable. **Ref:** 158.

Sierra Grande (8)

(see under lead)

Silver Tip (9)

(see under lead)

Skagit Queen (British) (4)

Loc: Secs. 5, 6, 7, 8, 17, and 18, (35-14E), Thunder Cr. dist. **Access:** 1 mi. by trail up Skagit Queen Cr. **Prop:** 32 claims and 4 millsites patented and 3 unpatented claims. **Owner:** British Mining Co. (1952—). Puget Sound, Chelan, and Spokane Railway Co. (1912). **Ore:** Silver, lead, copper, gold, molybdenum. **Deposit:** Gneiss cut by basic dikes reportedly contains 4 veins from 4 to 6 ft. wide. **Dev:** 670-ft. crosscut adit that failed to reach ore. **Assays:** Said to be \$15 to \$18 per ton in all values. **Ref:** 105, 1908, p. 686. 119, no. 2, 1912, p. 1. 158.

Soldier Boy (19)

(see under gold)

Standard

Loc: Thunder Cr. dist. **Owner:** Standard R. and D. Co. (1908). **Ore:** Silver, lead, copper. **Ref:** 116, no. 5, 1908, p. 130.

Stenmo

(see under lead)

Sullivan

(see Bunker Hill and Sullivan)

Thunder Creek (9A)

(see under lead)

Ventura (20)

Loc: SW¼ sec. 36, (35-13E), Cascade dist. **Ore:** Silver, lead, gold. **Ref:** 63, p. 55.

West Seattle (14)

(see under lead)

Willis and Everett (5)

Loc: Sec. 12, (35-13E), in Silver Basin on S. Fk. of Thunder Cr. **Prop:** 9 claims. **Owner:** British Mining Co. (1952—). Skagit Mining & Milling Co. (1897). Baker Mount Mining Co. (1902). Puget Sound, Chelan, and Spokane Railway Co. (1918). Thunder Creek Transportation & Smelting Co. (1918). Thunder Creek Mining Co. (1909-1926). **Ore:** Silver, lead, gold. **Deposit:** 3 veins. One is 8 to 12 ft. wide and another is 4 to 10 ft. wide. The 4- to 10-ft. vein has a granite footwall and porphyry hanging wall. **Assays:** High-grade ore runs as much as \$200 Ag, \$9 Au. **Prod:** Has produced. **Ref:** 63, p. 59. 88, p. 51.

SKAMANIA COUNTY

Athens

(see under copper)

Bronze Monarch (12)

(see under copper)

Brown and Livingston (15)

(see under gold)

Chicago (8)

(see under copper)

Coe

(see Sweden under copper)

Copper Canyon Mines

(see Yellow Jacket and Hoo Hoo under copper)

Cross Lode

Loc: Mt. St. Helens dist. **Owner:** Frank Thorne and James Pyron (1897). **Ore:** Silver. **Assays:** \$55 Ag (1897). **Ref:** 63, p. 50.

Earl

(see Samson under copper)

Gold Creek

(see Zinc Creek under zinc)

Grizzly Creek (5)

(see under gold)

Hoo Hoo

(see Yellow Jacket and Hoo Hoo under copper)

Independence (2)

(see under copper)

Index (6)

(see under copper)

Kentucky Belle**Loc:** Mt. St. Helens dist. **Ore:** Silver. **Ref:** 63, p. 50.**Last Chance (19)**

(see under copper)

Livingston

(see Brown and Livingston under gold)

Martha Washington

(see Bronze Monarch under copper)

Minnie Alice (1)

(see under copper)

Minnie Lee (4)

(see under copper)

Mount Fairy (9)

(see under gold)

Mountain King

(see under copper)

Norway (10)

(see under copper)

Plamondon (17)

(see under gold)

Polar Star (7)

(see under copper)

Primary Gold (16)

(see under gold)

Rainbow (20)

(see under vanadium)

St. Helens

(see Sweden under copper)

Samson (3)

(see under copper)

Sweden (13)

(see under copper)

- Yellow Jacket and Hoo Hoo (21)**
(see under copper)
- Yellow Metals (11)**
(see under copper)
- Young America (14)**
(see under copper)
- Zinc Creek (18)**
(see under zinc)
- SNOHOMISH COUNTY**
- Ajax (102)**
(see under gold)
- Ala-Dickson (80)**
(see under copper)
- Alleghany**
(see Foggy under copper)
- Alta (152)**
(see under gold)
- Anaconda**
(see under copper)
- Annie**
(see under gold)
- Arlington (32)**
(see under copper)
- Bald Mountain (33)**
(see under copper)
- Baltimore (70)**
(see under gold)
- Bangor Creek (44)**
(see under copper)
- Bear (153)**
(see under gold)
- Beatrice**
(see Sunset and Beatrice under lead)
- Beckler River**
(see under copper)
- Bell and Crown (77)**
(see under copper)
- Ben Lomond**
(see Rainy under gold)
- Bergensen**
(see Taylor & Nunn under gold)
- Big Bear and Butte (30)**
(see under gold)
- Big Copper (82)**
(see under copper)
- Big Four (67)**
(see under lead)
- Big Raymond (127)**
(see under gold)
- Billy Lee (154)**
(see under lead)
- Blackman**
(see Doris under copper)
- Blackstone (155)**
(see under copper)
- Blomquist (40)**
(see under copper)
- Blue Bird (2)**
(see under gold)
- Blue Bird (179)**
(see under gold)
- Blue Rock (71)**
(see under copper)
- Bluebell (156)**
(see under gold)
- Bon Ton (96)**
(see under copper)
- Bonanza**
(see Mineral Center under gold)
- Bonanza Queen (45)**
(see under copper)
- Bornite**
(see Bangor Creek under copper)
- Broken Ridge (180)**
(see under copper)
- Brown**
(see Doris under copper)
- Buckeye (209)**
(see under copper)
- Buckeye (9)**
Loc: SE¼ sec. 29, (32-9E), on White Horse Mtn., Darrington dist. **Prop:** 2 claims. **Ore:** Silver. **Dev:** 9-ft. adit. **Ref:** 14, p. 8. 63, p. 51.
- Bullet (42)**
(see under copper)
- Bullion King**
(see under gold)
- Bunker Hill**
(see Copper Belle under copper)
- Burns (4)**
(see under gold)
- Butte and Big Bear**
(see Big Bear and Butte under gold)
- Calumet**
(see Glacier Peak under copper)
- Calumet (143)**
(see under gold)
- Caplin-Holbrooke (105)**
(see under gold)
- Cascade (197)**
(see under copper)
- Cassidy (103)**
(see under gold)
- Castle (128)**
(see under gold)
- Champion (157)**
(see under gold)
- Charlotte (202)**
(see under copper)
- Clara Thompson**
(see Jasperson under gold)

- Cleveland (46)**
(see under copper)
- Cleveland**
(see under lead)
- Colts (29)**
(see under copper)
- Commonwealth**
(see Jasperson under gold)
- Commonwealth**
(see under gold)
- Consolidated**
(see under gold)
- Cooperative (194)**
(see under copper)
- Copper Belle (204)**
(see under copper)
- Copper Chief (158)**
(see under copper)
- Copper Cliff**
(see under gold)
- Copper Independent (47)**
(see under gold)
- Copper Prince (48)**
(see under gold)
- Copperhead (49)**
(see under copper)
- Cornucopia (68)**
(see under gold)
- Corona (122)**
Loc: Sec. 10, (28-11E), Silver Cr. dist. **Prop:** 2 claims. **Ore:** Silver, gold. **Deposit:** 6-ft. vein with 3 ft. of ore. **Dev:** 65-ft. adit. **Assays:** Surface ore runs \$22 Au, \$60 Ag. **Ref:** 14, p. 30, 63, p. 32.
- Courtney (17)**
(see under copper)
- Crown**
(see Bell and Crown under copper)
- Crown Point (159)**
(see under lead)
- Dahl**
(see Eclipse under gold)
- Daisy (123)**
(see under gold)
- Damm**
(see under copper)
- Darrington**
(see Gold Mountain under copper)
- Deerfly (26)**
(see under lead)
- Del Campo**
(see under gold)
- Delta**
(see under copper)
- Deway (181)**
(see under gold)
- Diamond Hitch (129)**
(see under copper)
- Dominion**
(see under lead)
- Doris (144)**
(see under copper)
- Dry Creek**
(see under gold)
- Eclipse (50)**
(see under gold)
- Edison (130)**
(see under gold)
- Editor (182)**
Loc: Sec. 18, (28-11E), at the head of Pole Gulch, Silver Cr. dist. **Ore:** Silver, lead. **Ore min:** Galena. **Deposit:** 2-ft. vein. **Dev:** Several open cuts. **Assays:** \$35 Ag. **Ref:** 14, p. 31, 63, p. 32.
- El Dorado (97)**
(see under copper)
- Elmo**
(see Gold Bar and Elmo under lead)
- Emma Moore (106)**
(see under lead)
- Emma No. 2**
(see under lead)
- Ethel (203)**
(see under copper)
- Ethel Consolidated**
(see Ethel under copper)
- Etruria**
(see under lead)
- Eureka (65)**
(see under copper)
- Everett (51)**
(see under copper)
- Evergreen (183)**
(see under copper)
- Fanny (52)**
(see under gold)
- Feldt (10)**
Loc: SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 30, (32-9E), on N. slope of White Horse Mtn., Darrington dist. **Elev:** 1,300 ft. **Access:** $\frac{3}{4}$ mi. by trail up Ashton Cr. from home of John Feldt. **Prop:** 7 unpatented claims. **Owner:** John Feldt, Darrington, Wash., and Axel Sjorgren, Seattle, Wash. (1949). **Ore:** Silver, antimony, lead, zinc, gold. **Ore min:** Stibnite, berthierite, pyrite, arsenopyrite, chalcopyrite, sphalerite, galena, tetrahedrite, cobaltite. **Gangue:** Calcite, quartz. **Deposit:** Mineralized breccia along a fault zone in altered volcanic rocks. The mineralized zone has a max. width of 7 in. **Dev:** 2 open cuts. **Assays:** A 7-in. channel sample across the mineralized zone gave 8.20 oz. Ag, 0.07 oz. Au, 0.09% Cu, 2.79% Pb, 2.20% Zn, 0.18% Sb. **Ref:** 132, pp. 127-129.
- Florence-Rae (198)**
(see under copper)
- Florence Rae (Rudebeck-Florence Rae) (147)**
(see under copper)
- Foggy (98)**
(see under copper)
- Forest Hope (5)**
(see under copper)

Fortunate

(see under gold)

Fortunate (131)

(see under gold)

"45" (Magus) (78)

Loc: Secs. 29 and 30, (30-10E). **Elev:** 2,500 to 4,500 ft. **Access:** 6 mi. from Sultan Basin road by road up Williamson Cr. **Prop:** 25 patented claims and fractions. **Owner:** The 45 Mines Inc. (1931—). Forty-Five Consolidated Mining Co. (1902-1907). **Ore:** Silver, lead, gold, zinc, copper. **Ore min:** Galena, sphalerite, ruby silver, chalcopyrite, arsenopyrite, pyrite, pyrrhotite, marcasite, scheelite, tetrahedrite. **Gangue:** Quartz, calcite. **Deposit:** Mineralized fracture zones in metamorphic rocks. One vein, the Magus, has an indicated length of 3,000 ft. **Dev:** More than 4,000 ft. of underground workings. **Improv:** 3 cabins, the remains of several other buildings and 2 tram lines. **Assays:** Ore shipped returned 0.35 to 1.06 oz. Au, 48.4 to 171.4 oz. Ag. Other assays show 3.7% to 4.3% Zn, 4.6% to 6.5% Pb, 6.2% to 18.5% As, 0.28 to 0.6 oz. Au, 8.0 to 10.4 oz. Ag. **Prod:** Approx. 3,185 tons of ore 1896 to 1902. **Ref:** 14, p. 47. 23, pp. 39-46. 33, 1907, p. 605. 43, no. 5, 1898, pp. 39-40. 46, pp. 166-167. 63, p. 24. 88, pp. 66-67. 104, 9/15/35, p. 23. 105, no. 2, 1905, p. 35. 106, 5/21/31; 9/3/31, p. 13. 112 p. 179. 114, no. 5, 1909. 129, pp. 296-297. 158. 159, p. 136.

Four Brothers (160)

(see under lead)

Garfield

(see under lead)

Gettysburg (161)

(see under lead)

Gift

(see under gold)

Glacier Peak (25)

(see under copper)

Glengarry

Loc: NW. of Silverton near the Three Sisters prospect. **Prop:** 9 claims. **Ore:** Silver, gold, copper. **Ore min:** Tetrahedrite. **Deposit:** 45 in. of ore. **Assays:** \$140.70 Ag, \$4.20 Au. **Ref:** 14, p. 43. 63, p. 20.

Glory of the Mountain (72)

(see under gold)

Golconda

(see under lead)

Gold Bar (132)

(see under copper)

Gold Bar and Elmo

(see under lead)

Gold Mountain (8)

(see under copper)

Gold Standard (162)

(see under gold)

Golden Chord (34)

(see under gold)

Golden Cord

(see Justice under gold)

Golden Eagle (151)

(see under molybdenum)

Good Hope (107)

(see under gold)

Granite and Maud (53)

(see under gold)

Gray Eagle (184)

(see under copper)

Gray Mare (Old Gray Mare) (11)

(probably same property as Whitehorse under zinc)

Loc: Sec. 30 (?), or SE¼ sec. 29, (32-9E). **Elev:** 1,700 to 1,900 ft. **Access:** 9 mi. by road from Darrington. **Prop:** 3 claims: Snow Gulch, Gray Mare Nos. 1 and 2. **Owner:** W. J. Lee, Seattle, and Mrs. Charles Lawson and Earl Beman, Arlington, Wash. (1943). **Ore:** Silver, lead, zinc, antimony, gold. **Ore min:** Galena, silver sulfides, sphalerite. **Deposit:** Mineralized breccia zones in cherty limestone and calcareous shale. May be considerable low-grade ore. **Dev:** 50-ft. adit, another short adit, some surface workings. **Assays:** Assays, probably on handpicked samples, show 15.8 to 245 oz. Ag, 20% to 70% Pb, 1% to 3% Zn, 0.3% to 9.8% Sb, 0.01 oz. Au, 0.34% As. **Ref:** 58, p. 50. 157. 158.

Great Northern (87)

(see under gold)

Great Scott (124)

(see under gold)

Green Crown (12)

(see under copper)

Grizzly

(see under copper)

Gunn Peak (207)

(see under copper)

Gypsy Queen (163)

(see under lead)

Hammond

(see Keystone under copper)

Hancock (133)

(see under copper)

Hannah (13)

(see under copper)

Hard Pass (148)

(see under copper)

Hecla (35)

(see under copper)

Helena (28)

(see under copper)

Helena and Sadie (149)

(see under copper)

Hiawatha (108)

(see under gold)

Hicks

(see Sultan King under copper)

Hidden Treasure**Loc:** Silver Cr. dist. **Ore:** Silver, lead. **Ref:** 13, p. 160.**Highland (24)**

(see under copper)

J. J. Hill

(see under gold)

Holbrooke

(see Caplin-Holbrooke under gold)

Homestead

(see Cascade under copper)

Hoodoo (54)
(see under copper)

Howard
(see Cooperative under copper)

Hunter (18)
(see under copper)

Idaho (164)
(see under lead)

Imperial (55)
(see under copper)

Independent
(see Copper Independent under gold)

Index
(see Lake Serene under copper)

Index Bornite (205)
(see under copper)

Index Gold Mines, Inc. (185)
(see under gold)

Index-Independent
(see Lake Serene under copper)

Iowa (Mint) (145)
(see under copper)

Iowa (Washington-Iowa)
(see Washington-Iowa under copper)

Isabell
(see Red Cross under copper)

J. B. (109)
(see under gold)

Jackson
(see St. Louis and Jackson under copper)

Jasper
(see under lead)

Jasperson (165)
(see under gold)

Jesse (19)
(see under gold)

Jim Dandy (166)
(see under gold)

Jones (178)
Loc: Center N½ sec. 11, (28-10E), on Elk Cr. about 5 mi. above confluence with N. Fk. Sultan R. **Elev:** 3,000 ft. **Owner:** Abandoned (1943). **Ore:** Reportedly silver-lead. **Dev:** Reportedly a shaft now obliterated by snowslides. **Improv:** Parts of a water wheel, cabin, and hoisting equipment. **Ref:** 23, p. 74.

Jones
(see Kromona under copper)

Jumbo (134)
(see under gold)

Junie
(see under copper)

Justice (110)
(see under gold)

Justin (6)
(see under gold)

Kena and Troly
(see Skrinde under copper)

Keystone (86)
(see under copper)

Keystone (91)
(see under gold)

Keywinder (20)
(see under copper)

Kromona (200)
(see under copper)

Lake Serene (206)
(see under copper)

Lakeview Extension (27)
(see under gold)

Lalla Rookh
(see Tobique and Lalla Rookh under gold)

Lambert
(see under copper)

Larson (1)
(see under lead)

Last Chance (186)
(see under gold)

Last Hope
(see under gold)

Le Roy (89)
Loc: N½ sec. 19, (29-11E), Silver Cr. dist. **Access:** 10 mi. E. of Index on Mineral City road. **Owner:** Index Gold Mines, Inc. **Ore:** Silver, lead, platinum, gold. **Ref:** 158.

Lida (135)
(see under copper)

Lily James (56)
(see under gold)

Little Chief (81)
(see under copper)

Little Giant (69)
(see under gold)

Lockwood (167)
(see under lead)

Lockwood Pyrite (88)
(see under iron)

Lost Creek (195)
(see under copper)

Louise
(see Mineral Center under gold)

Lulu (57)
(see under gold)

M and H No. 2 (168)
(see under gold)

McCombs
(see Jasperson under gold)

Mackinaw (90)
(see under copper)

Magus
(see "45")

Marguerite Mosher
(see under copper)

Martin Engdahl (169)
(see under lead)

- Maud**
(see Granite and Maud under gold)
- Michigan (187)**
(see under gold)
- Miiki Maru (150)**
(see under gold)
- Milwaukee (79)**
(see under zinc)
- Mineral Center (136)**
(see under gold)
- Mineral Mines (170)**
(see under copper)
- Minnehaha (111)**
(see under gold)
- Mint**
(see Iowa under copper)
- Molly**
(see under gold)
- Monitor and Sterling (43)**
(see under copper)
- Monte Cristo (104)**
(see under gold)
- Morning Star (125)**
(see under lead)
- Mosher**
(see Marguerite Mosher under copper)
- Mountain Cedar (84)**
(see under copper)
- Mountain Goat**
(see under lead)
- Murdock**
(see under lead)
- Myrtle C. (7)**
(see under copper)
- Mystery (Monte Cristo, Pride)**
(see Monte Cristo under gold)
- Mystery (Mountain Cedar, Paystreak)**
(see Mountain Cedar under copper)
- National (137)**
(see under copper)
- Nemo (58)**
(see under gold)
- Nesta (21)**
(see under copper)
- Nevada (73)**
(see under copper)
- New Seattle (36)**
Loc: NW¼ sec. 2, (30-9E), near the head of Martin Cr., Silverton dist. Ore: Silver, gold, copper, antimony. Ore min: Tetrahedrite. Deposit: 5-ft. vein. Dev: Adit. Assays: 350 oz. Ag, \$5.69 Au. Ref: 14, p. 45. 63, p. 22.
- New York (59)**
(see under copper)
- New York-Seattle (126)**
(see under copper)
- Nickel Bird (60)**
(see under copper)
- Non Pareil (196)**
(see under copper)
- North Star**
(see Sunrise under gold)
- Northwest Consolidated**
(see under gold)
- Nunn**
(see Taylor & Nunn under gold)
- O and B (92)**
(see under copper)
- Occidental (83)**
(see under gold)
- Old Gray Mare**
(see Gray Mare)
- Oldfield**
(see Sunrise under gold)
- Ontario (171)**
(see under lead)
- Ore Recoveries (61)**
(see under copper)
- Oro Fino (188)**
(see under copper)
- Orphan Boy (112)**
(see under gold)
- P. I. (189)**
(see under copper)
- P. and I. (93)**
(see under gold)
- Paystreak**
(see Mountain Cedar under copper)
- Peabody (113)**
(see under gold)
- Penn**
(see Foggy under copper)
- Perm**
(see under gold)
- Philo (99)**
(see under copper)
- Pride**
(see Monte Cristo under gold)
- Pride of Index**
(see Lake Serene under copper)
- Pullman**
(see under lead)
- Q. T. (114)**
(see under gold)
- Queen Anne (22)**
(see under gold)
- Rainy (94)**
(see under gold)
- Red Cloud (172)**
(see under gold)
- Red Cross (201)**
(see under copper)
- Republican (100)**
(see under lead)

- Ruby King (173)**
(see under gold)
- Rudebeck-Florence Rae**
(see Florence Rae under copper)
- Sadie**
(see Helena and Sadie under copper)
- St. Louis (174)**
(see under copper)
- St. Louis and Jackson (37)**
(see under copper)
- Sam Strom (3)**
(see under copper)
- Scriber**
(see Kromona under copper)
- Seattle**
(see under gold)
- Seattle**
(see New York-Seattle under copper)
- Seventy Six (115)**
(see under lead)
- Shirley (190)**
(see under gold)
- Sidney (116)**
(see under gold)
- Silver Coin (38)**
(see under gold)
- Silver Creek**
(see Broken Ridge under copper)
- Silver Horseshoe (66)**
Loc: SW $\frac{1}{4}$ sec. 33, (30-10E). **Elev:** 4,500 to 4,800 ft. **Access:** A steep trail 1 mi. long from Williamson Cr. to Copper Lk. crosses the property. **Prop:** 10 claims: Silver Horseshoe Nos. 1 to 10. **Owner:** Forrest E. Wing and associates, Tacoma, Wash. (1943). **Ore:** Silver, lead, gold, zinc, copper. **Ore min:** Galena, sphalerite, chalcopyrite, pyrite, arsenopyrite, pyrrhotite, scheelite, molybdenite. **Gangue:** Quartz, calcite, gouge. **Deposit:** Mineralized shear zone 2 ft. wide in quartz diorite and mineralized tension fractures extending out from shear zone 5 to 6 ft., some as much as 30 ft. **Dev:** Open cuts. **Assays:** Mineralized zone est. to assay 1% to 2% Cu, 4% to 5% Zn, 3% to 4% Pb. Assays show 3.6% to 11.3% Pb, 0.04 to 0.42 oz. Au, and 4.8 to 160.8 oz. Ag. **Ref:** 23, pp. 47-49.
- Silver Lake (117)**
(see under gold)
- Silver Queen (118)**
(see under gold)
- Silver Slipper (175)**
(see under gold)
- Skrinde (191)**
(see under copper)
- Sloman**
(see under gold)
- Standard**
(see under lead)
- Sterling**
(see Monitor and Sterling under copper)
- Sultan King (146)**
(see under copper)
- Sultan Queen**
(see Sultan King under copper)
- Sunday Star**
(see under gold)
- Sunrise (85)**
(see under copper)
- Sunrise (14)**
(see under gold)
- Sunset (199)**
(see under copper)
- Sunset (74)**
(see under gold)
- Sunset and Beatrice (192)**
(see under lead)
- Taylor & Nunn (15)**
(see under gold)
- Texas (193)**
(see under gold)
- Threadwell**
(see under gold)
- Three Sisters (62)**
(see under gold)
- Three Star (75)**
(see under gold)
- Tobique and Lalla Rookh (95)**
(see under gold)
- Trade Dollar**
(see under lead)
- Troly**
(see Skrinde under copper)
- Troublesome Pass**
Loc: At Troublesome Pass $\frac{1}{2}$ mi. E. of Hubbard Peak, Monte Cristo dist. **Ore:** Silver, gold. **Deposit:** Altered and pyritized andesite. **Assays:** Tr. Au, 0.44 oz. Ag. **Ref:** 149, p. 830.
- Tum Tum**
(see Taylor & Nunn under gold)
- Twentieth Century (119)**
Loc: Sec. 27, (29-11E), Monte Cristo dist. **Ore:** Silver, gold. **Ref:** 14, p. 26. 114, no. 5, 1909, p. 104.
- Uncle Sam (208)**
(see under copper)
- Undaunted (138)**
(see under gold)
- Union (76)**
(see under gold)
- Vandalia (176)**
(see under lead)
- Victory**
(see under gold)
- Virginia (63)**
(see under copper)
- Washington-Iowa (139)**
(see under copper)
- Wayside (39)**
(see under copper)
- Webster**
(see Jasperson under gold)

Weden Creek

(see Mackinaw under copper)

Westland (177)

(see under copper)

Whaleback (140)

(see under gold)

Whistler (101)

(see under lead)

White Gander (23)

(see under copper)

White Swan (31)

Loc: Sec. 3, (30-9E), at headwaters of Martin Cr., Silverton dist. **Ore:** Silver. **Deposit:** Vein parallel to the Doubtful vein. **Dev:** 50-ft. adit. **Assays:** 200 oz. Ag from outcrop. **Ref:** 14, p. 45. 63, p. 22.

Whitehorse (16)

(see under zinc)

Wilbur Index

(see Lake Serene under copper)

Wild Rose (141)

(see under copper)

Wildcat (120)

(see under gold)

Winnie (142)

(see under copper)

Winter Coon (64)

(see under gold)

Zeta (121)

(see under gold)

SPOKANE COUNTY**Silver Hill (1)**

(see under tin)

STEVENS COUNTY**A and C (117)**

(see under copper)

Abe Lincoln

(see Comstock under lead)

Acme (158)

(see under lead)

Acme (F. H. and C.)

(see F. H. and C. under gold)

Admiral (219)

(see under copper)

Admiral Consolidated (91)

(see under zinc)

Advance (82)

(see under zinc)

Aguila (160)

(see under lead)

Aichan Bee (Austin, Mineral Hill, H & B) (243)

Loc: Center NE¼ sec. 15, (29-37E), Deer Trail dist. **Elev:** 2,700 to 3,650 ft. **Access:** 35 mi. by road from railroad at Davenport. **Prop:** 6 patented claims including the Austin. **Owner:** P. J. O'Brien, Spokane, Wash. (1951—). Mineral Hill Mining Co. (1930). Transcontinental Precious Metals Co. (1935). Aichan Bee Silver-Lead Mining Co., Spokane, Wash. (1918-

and 1938-1943). **Ore:** Silver, lead, zinc. **Ore min:** Sphalerite, galena, pyrite, chalcopyrite. **Gangue:** Quartz. **Deposit:** Ore is found in a fracture zone in argillite and quartzite near contact with granite. Ore is disseminated in colorless quartzite. It is also found in a ledge in limestone. **Dev:** Adit more than 600 ft. long, 150-ft. drift (caved at portal, 1951). **Assays:** Ore from one zone said to carry 12% Pb, 18% Zn, 12 oz. Ag. A 4-ft. sample showed 1.9% Pb, 2.2% Zn, 1.75 oz. Ag. **Prod:** Small amount of Zn ore shipped about 1943. **Ref:** 30, p. 69. 46, pp. 108-109. 73, pp. 136-137. 98, 1920-1926. 99, 2/12/35. 104, 4/15/37, p. 35. 106, 4/3/30, 11/6/30. 112, 1918, p. 164. 141, p. 22. 150, p. 37. 157. 158.

Al Ki (116)

(see under lead)

Aladdin (139)

(see under lead)

Aladdin (Blue Ridge, Sierra Zinc)

(see Sierra Zinc under zinc)

Alberta (245)

(see under copper)

Alert

(see under gold)

Alice

(see under copper)

Alma (Black Witch) (159)

Loc: Sec. 27, (35-37E), Kettle Falls dist. **Elev:** 2,640 ft. **Prop:** 1 unpatented claim. **Owner:** Abandoned (1941). **Ore:** Said to be silver, lead, zinc, gold. **Ore min:** Pyrite. **Deposit:** Quartz vein in quartzite. **Dev:** 30-ft. shaft, several open cuts and adits total about 200 ft. **Ref:** 30, p. 58. 58, p. 3. 164, p. 225.

Amazon (185)

(see under copper)

Anaconda (96)

(see under lead)

Ark (Silver Queen) (155)

(see also E. M. C. under lead)

Loc: Near center N½ sec. 11, (35-37E), Kettle Falls dist. **Elev:** 1,970 ft. **Access:** 1 mi. by dirt road to State Highway 22 at a place 6 mi. S. of railroad at Kettle Falls. **Prop:** 9 patented and 10 unpatented claims, including the old E. M. C. property. **Owner:** D. Warfield, Cleveland, Ohio (1950). Ark Group Mining & Milling Co. (1915-1920). Ark Mines Co. (1918-1940). Continental Silver & Smelting Co. (1936). **Ore:** Silver, lead, zinc, copper, gold. **Ore min:** Tetrahedrite, galena, sphalerite, chalcopyrite, pyrite. **Gangue:** Quartz, calcite. **Deposit:** Quartz lenses from a few inches to 3 or 4 ft. wide along lamination planes of argillite and limestone. Mineralized zone as much as 30 ft. wide. **Dev:** 100-ft. inclined shaft and 3 short drifts from the shaft, 150-ft. shaft, 1,700-ft. adit with a 130-ft. raise. These workings expose the vein to a depth of 250 ft. **Assays:** One sample assayed 10 oz. Ag, 1% Cu, 1% Pb, 1% Zn. Some samples said to run \$5 Au. **Prod:** 1915 (14 tons), 1916, 1918, 1921, 1922, 1929, 1937, 1,700 tons of ore milled in 1938, 250 tons of ore 1939, a few tons of conc. 1940, 1942, 841 tons of ore 1949. **Ref:** 7, pp. 125-126. 30, p. 58. 46, pp. 105-107. 69, p. 5. 97, 1916, 1918, 1921, 1922, 1929, 1938-1941. 98, 1918-1926. 104, 11/30/34, p. 23; 8/15/36, p. 28; 3/30/36, p. 22. 106, 12/3/28, p. 12; 3/3/30. 112, p. 166. 129, pp. 143-144. 158. 164, pp. 226-227.

Austin

(see Aichan Bee)

Avondale-Dome (127)

(see under lead)

- B and B (213)**
(see under copper)
- Bald Eagle (12)**
(see under gold)
- Banner**
(see Chinto under copper)
- Banshee (209)**
(see under copper)
- Baxter**
(see Snyder and Baxter)
- Bear Canyon (176)**
(see under copper)
- Bear Mountain (177)**
(see under lead)
- Bechtol (85)**
(see under lead)
- Beecher (14)**
(see under gold)
- Belcher (184)**
(see under copper)
- Benvenue**
(see Gold Reef under gold)
- Bertha M. (179)**
(see under lead)
- Big Chief (124)**
(see under lead)
- Big Iron (55)**
(see under iron)
- Black Canyon**
(see under lead)
- Black Horse**
(see Columbia Tungsten under tungsten)
- Black Witch**
(see Alma)
- Blanche**
Loc: Chewelah dist. **Ore:** Silver, copper. **Ore min:** Chalcocite. **Deposit:** 2-ft. quartz vein. **Assays:** 100 to 400 oz. Ag, 8% to 10% Cu. **Prod:** Prior to 1900. **Ref:** 12, p. 77. 13, p. 149.
- Bland**
(see under lead)
- Bliss**
(see Galena Hill under lead)
- Blue Bird (41)**
(see under gold)
- Blue Grass (29)**
(see under gold)
- Blue Ridge**
(see Sierra Zinc under zinc)
- Blue Star**
(see Eagle)
- Bluebird**
(see Loon Lake Copper under copper)
- Bluegrouse (154)**
Loc: Sec. 9, (35-38E), Kettle Falls dist. **Access:** 3 mi. from road. **Prop:** 2 unpatented claims. **Owner:** Abandoned (1941). **Ore:** Silver, lead. **Deposit:** Quartz vein. **Dev:** 375-ft. adit (caved 1941). **Ref:** 30, p. 57.
- Bonanza (112)**
(see under lead)
- Bonanza Copper (227)**
(see under copper)
- Botts (120)**
(see under lead)
- Boundary Silver Lead**
(see Lucile under zinc)
- Brook (164)**
Loc: Sec. 7, (33-38E). **Access:** 4 mi. E. of Daisy by road. **Ore:** Silver. **Ref:** 158.
- Brooks (237)**
Loc: Near NE. cor. sec. 11, (29-37E), Deer Trail dist. **Elev:** 3,700 to 3,900 ft. **Access:** 10 mi. by road SE. of Fruitland. **Prop:** 3 claims: Brooks, Success, First Adventure. **Owner:** Abandoned (1941). Brooks Mining Co. (1915). **Ore:** Silver, lead, zinc, copper, gold. **Ore min:** Stephanite, pyrite, galena, sphalerite, tetrahedrite. **Deposit:** Series of limestone and argillites intruded by lamprophyric dikes is cut by 5- to 7-ft. quartz veins. **Dev:** 50-ft. shaft, 80-ft. adit, another adit caved 100 ft. from portal, open cut. **Prod:** 2 carloads shipped prior to 1901. **Ref:** 7, p. 116. 30, p. 73. 88, p. 11. 100, 1901, p. 86. 164, pp. 192-193.
- Bruce Creek**
(see A and C under copper)
- W. J. Bryan**
(see Bechtol under lead)
- Buck Mountain**
Loc: 4 mi. N. of Cedar Canyon, Colville dist. **Access:** 12 mi. by road from railroad at Springdale. **Ore:** Silver, copper, lead, gold. **Ref:** 58, p. 11. 63, p. 113.
- Buffalo (109)**
Loc: Sec. 12, (40-42E), Northport dist. **Access:** 12 mi. by road to railroad at Boundary. **Owner:** Newton Hartman, Colville, Wash. **Ore:** Silver, lead, zinc, gold. **Ref:** 158.
- Bullion (61)**
(see under lead)
- Burrus (138)**
(see under zinc)
- Butte (25)**
(see under gold)
- Cantaloupe (165)**
Loc: Sec. 7, (33-38E), Kettle Falls dist. **Access:** 4 mi. E. of Daisy. **Ore:** Silver. **Ref:** 158.
- Cast Steel (76)**
(see under lead)
- Cedar Canyon**
Loc: Cedar Canyon dist. **Ore:** Silver, lead. **Prod:** 1912. **Ref:** 97, 1913, p. 799.
- Centennial (42)**
(see under copper)
- Center Star (125)**
Loc: Secs. 23 and 24, (37-39E), Colville dist. **Ore:** Silver, lead. **Ref:** 158.
- Charity**
(see F. H. and C. under gold)
- Chewelah Consolidated (178)**
(see under lead)

Chewelah Eagle
(see Eagle)

Chewelah Silver
(see Fred B. under lead)

Chewelah Standard (194)
(see under copper)

Chinto (186)
(see under copper)

Chloride (223)
(see under lead)

Chloride Queen (126)
(see under lead)

City View (153)
(see under gold)

Clara (103)
(see under gold)

Cleveland (222)
(see under lead)

Clugston
(see Silver Trail under lead)

Columbia
(see Iroquois under zinc)

Columbia River (149)
(see under copper)

Columbia Tungsten (173)
(see under tungsten)

Colville Queen
(see Chloride Queen under lead)

Comstock (18)
(see under copper)

Comstock (Abe Lincoln) (56)
(see under lead)

Contention
(see Mountain View)

Copper Butte (33)
(see under copper)

Copper King (202)
(see under copper)

Copper King (95)
(see under lead)

Copper Queen (181)
(see under copper)

Copper Queen (187)
(see under copper)

Coyote (68)
(see under lead)

Coyote (Rightside)
(see Rightside under copper)

Coyotte
(see Coyote under lead)

Crown Point (47)
Loc: Sec. 7, (39-38E), Kettle Falls dist. **Owner:** Dr. J. N. Norton, Daisy, Wash. **Ore:** Silver. **Ref:** 158.

Daisy
(see Daisy-Tempest)

Daisy-Tempest (Silver Mountain) (166)
(includes Daisy and Tempest mines)
(see also Tempest)

Loc: Secs. 6 and 7, (33-38E), on W. slope of Huckleberry Mtns., Kettle Falls dist. **Elev:** 2,900 to 3,400 ft. **Access:** 5 mi. E. of Daisy by good truck road. 22 mi. to railroad at Kettle Falls. **Prop:** 16 claims and additional property total about 580 acres. **Owner:** Daisy Silver-Lead Mines, Inc., Spokane, Wash. (1948-1952). Silver Mountain Mining Co. (1916-1922). Consolidated Silver Mountain Mining Co., Ltd. (1923-1933). Carl Lawson & Associates (1942-1943). **Ore:** Silver, lead, copper, gold. **Ore min:** Galena, chalcopyrite, pyrite (nickeliferous), sphalerite, marcasite, scheelite, tetrahedrite, arsenopyrite. **Gangue:** Quartz, calcite. **Deposit:** At least 4 quartz veins from a few in. to 12 ft. in width cut a series of argillites and quartzites intruded by diorite. **Dev:** 4 adits and a shaft on Daisy claim total 4,000 ft., and an adit and shaft on Tempest claim total 2,600 ft. **Improv:** 50-ton mill, shops, and 4 houses (1948). **Assays:** 1 to 20 oz. Ag, Ni, Co reported. Weighted av. of 4 samples shows 4.6-ft. width, 0.5% Pb, 1.3% Zn, 0.04% Cu, 4.82% As, 0.005 oz. Au, 2.22 oz. Ag. **Prod:** 2,000 tons prior to 1890, 1915, 1917, 1923, 1929, 1934-35 (50 tons of conc.). **Ref:** 12, pp. 26, 73-74, 79. 13, p. 119. 30, p. 65. 37, pp. 65-67. 73, pp. 124-126. 97, 1916, 1918, 1924, 1926, 1930, 1935, 1936. 98, 1922-1926. 104, 6/30/33, p. 18; 7/30/33, p. 19; 6/15/35, p. 27. 106, 11/17/30. 112, p. 203. 129, pp. 136-143. 141, p. 22. 157. 158. 164, pp. 227-230.

Dead Medicine
(see Silver Trail under lead)

Deep Creek (79)
(see under zinc)

Deep Lake
(see Farmer under zinc)

Deer Trail (Providence, Venus) (236)
(see also Legal Tender, Providence, Hoodoo)

Loc: Secs. 1 and 12, (29-37E), Deer Trail dist. **Elev:** 3,550 to 3,775 ft. **Access:** 8 mi. from Fruitland by road. **Prop:** Idaho, Hoodoo, Runyan Fr., Jolly Boy, Moonshine, Elephant, Legal Tender, Deer Trail, Hoodoo Ext., Victor Fr., Providence, Royal Ext., Happy Home, Splawn, Deen claims. **Owner:** Alpine Uranium Corp., Salt Lake City, Utah (1954—). Deer Trail Consolidated Mining Co. (1902-1909). Consolidated Mines Co. (1918-1924). Western States Mine Co. (1924). Venus Silver Mines Co. (1925-1930). Geo. Vervaeke (1934). Metals Development Co. (1939). Max Slate, Albany, Oreg. (1951). **Ore:** Silver, lead, zinc, copper. **Ore min:** Argentiferous galena, argentite, cerargyrite, sphalerite, azurite, malachite, pyrrargyrite. **Deposit:** Quartz-calcite veins cutting argillite and limestone along a shear zone. In one place the ore body is 2½ ft. thick. **Dev:** 11 adits, drifts, and raises total more than 4,000 ft. of underground workings. **Improv:** 125-ton flotation mill (1954). **Assays:** Ore said to av. about 20 oz. Ag. **Prod:** 1906-1908, 1911-1912, 1917-1918, 1924, 1927, 1929, 1934, 1939, 1940, 1945-1947. More than \$3,000,000 total production reported. **Ref:** 7, pp. 117-118. 30, p. 69. 63, pp. 114-115. 73, pp. 134-136. 88, pp. 9-10. 97, 1907, 1908, 1912, 1913, 1918, 1919, 1925, 1928, 1930, 1935. 98, 1920-1926. 104, 9/30/35, p. 24. 113, 8/34, p. 13. 114, no. 5, 1909, p. 58. 129, p. 149. 150, p. 30. 164, pp. 195-201.

Defender (30)
(see under zinc)

Delmonico
(see Jay Dee)

Dora
(see Acme under lead)

Double Eagle (218)
(see under lead)

Double Standard (57)
(see under copper)

Douglas
(see under tungsten)

Douglas Hunter
(see under gold)

E. M. C. (156)
(see under lead)

Eagle (Blue Star, Redwood, Chewelah Eagle) (203)
(see also Redwood)

Loc: Near center N½ sec. 5, (32-41E) and sec. 32, (33-41E). **Elev:** 3,000 ft. **Access:** 4½ mi. by road NE. of Chewelah. **Prop:** 1 patented, 7 unpatented claims, and some deeded land. **Owner:** Chewelah Eagle Mining Co. (1949-1951). Eagle Gold Mining Co. (1908). Blue Star Mining Co. (1911-1926). **Ore:** Silver, lead, copper, zinc, gold, molybdenum. **Ore min:** Galena, tetrahedrite, sphalerite, chalcopyrite, pyrite, pyrrhotite, cerussite, anglesite, malachite, azurite, molybdenite. **Gangue:** Quartz. **Deposit:** Irregular lenses and replacements in dolomitic limestone near granite contact. Ore bodies from a few in. to 3 or 4 ft. wide and a few ft. to 50 ft. or more long. **Dev:** Main level with more than 3,000 ft. of crosscuts and drifts. Shaft 217 ft. deep. **Prod:** Prior to and during 1890, 1911, 1925. Production to 1925 was \$150,000. **Ref:** 7, pp. 105-106. 12, pp. 26, 75. 13, p. 121. 30, p. 32. 63, p. 113. 68, pp. 7, 21. 97, 1912, p. 923; 1926, p. 469. 98, 1922-1926. 114, no. 5, 1909, p. 57. 150, p. 29. 158, 164, pp. 148-149.

Eagle-Newport
(see *Aguila* under lead)

Easter Sunday (53)
(see under gold)

Easy Money
(see *Magma* under zinc)

Echo (123)
(see under zinc)

Edna (216)
(see under copper)

Eldorado (102)
(see under lead)

Eldorado (Magma)
(see *Magma* under zinc)

Electric Point (86)
(see under lead)

Enterprise
(see under gold)

Enterprise
(see *Jay Dee*)

Esther Hilbert
Loc: Deer Trail dist. **Ore:** Silver. **Ref:** 63, p. 115.

Eureka (3)
(see under gold)

Eureka (Uncle Sam)
(see *Uncle Sam* under lead)

Eureka and Orient
(see *Eureka* under gold)

Examiner
(see under gold)

Excelsior
(see under lead)

Express
(see *St. Paul-Express* under copper)

F. H. and C. (6)
(see under gold)

Faith
(see *F. H. and C.* under gold)

Farmer (84)
(see under zinc)

Finley
(see under lead)

First Thought (26)
(see under gold)

Fish (157)
Loc: Sec. 24, (35-37E). **Owner:** John Marty, Kettle Falls, Wash. (1941). **Ore:** Silver, lead, copper. **Dev:** 250-ft. adit, 60-ft. shaft, 80-ft. crosscut. **Ref:** 158.

Fissure (10)
(see under gold)

Flannigan
(see *Iroquois* under zinc)

Fred B. (206)
(see under lead)

Frisco Standard (108)
Loc: S½NW¼ sec. 12, (40-42E), on Jubilee Cr., just S. of international boundary. **Elev:** 3,700 ft. **Access:** 14 mi. by road from railroad at Boundary. 18 mi. by road from railroad at Metaline Falls. **Prop:** 9 claims, of which 7 are patented: *H. R. H.*, *Big Strike*, *Frisco*, *Buffalo*, *Standard*, *Syndicate*, *Boulder*. **Owner:** Northport Operating Co., Olympia, Wash. (1953—). *Frisco Standard Mining Co.* (1905-1953). *Northport Mining & Development Co., Inc.*, Olympia, Wash. (1951). **Ore:** Silver, lead, copper, zinc, gold. **Ore min:** Galena, tetrahedrite, chalcopyrite, sphalerite, pyrrargyrite, cerargyrite, bromyrite, azurite, malachite, stannite. **Deposit:** Quartz veins or lenses up to 7 ft. wide in sheared graphitic schist. Veins occur along the planes of schistosity. One vein varies from a few inches to 6 ft. in width. **Dev:** 1,000 ft. of accessible workings and several caved adits. **Improv:** Cookhouse and cabin (1951). **Assays:** Sample across 5-ft. width in lower adit showed 1.00% Zn, 0.10% Pb, 0.23% Cu, 3.35 oz. Ag. 3 small shipments showed 49.2 to 72.8 oz. Ag, 7% to 16.8% Pb, 2.7% to 4.6% Cu, tr. to 0.01 oz. Au. **Prod:** Small, intermittent. **Ref:** 7, pp. 58-59. 30, p. 95. 73, p. 104. 97, 1905, p. 337; 1908, p. 581. 98, 1922-1926. 112, p. 179. 128, pp. 61-62. 129, pp. 112-114. 150, p. 37. 157. 158. 164, p. 304.

Galena Farm (130)
(see under lead)

Galena Hill (20)
(see under lead)

Galena Knob (127A)
(see under lead)

Galena Ridge
(see *Galena Farm* under lead)

Georgic (36)
(see under copper)

Germania (234)
(see under tungsten)

Giant Silver

(see Red Cloud under copper)

Gillete

(see Avondale-Dome under lead)

Gladstone (87)

(see under lead)

Globe (34)

(see under copper)

Gold Bar (113)

(see under gold)

Gold Hill

(see under gold)

Gold Ledge (148)

(see under gold)

Gold Reef (147)

(see under gold)

Golden Hope

(see Sunday under gold)

Golden Reef

(see Gold Reef under gold)

Good Enough

(see Sandiego)

Goodenough (167)**Loc:** Sec. 7, (33-38E), 4 mi. E. of Daisy, Kettle Falls dist.
Ore: Silver. **Ref:** 158.**Gorien Zinc**

(see under zinc)

Graves (35)

(see under copper)

Gray Eagle

(see Rightside under copper)

Great Republic (58)

(see under copper)

Grubstake**Loc:** 7 mi. NE. of Orient. **Elev:** 2,700 ft. **Access:** Road. **Prop:** 2 unpatented claims. **Owner:** F. C. Forsyth and L. E. Gourlie, Orient, Wash. (1934). **Ore:** Gold, lead, zinc. **Ore min:** Galena. **Deposit:** 2-ft. vein in quartzite. **Dev:** A 225-ft. adit with winze and a 50-ft. raise to the surface. **Assays:** Old assay reported 12 oz. Au, and a total of \$34.00 per ton. **Ref:** 158.**Guaranty****Loc:** Blue Cr. area. **Ore:** Silver. **Prod:** 1914. **Ref:** 97, 1914, p. 652.**H & B**

(see Aichan Bee)

Ham (171)

(see under lead)

Hartbauer (94)

(see under lead)

Hartford

(see Krug under copper)

Hazel (Lake View) (99)**Loc:** Near center sec. 19, (40-42E), on N. side of highest point of Red Top Mtn., Northport dist. **Elev:** 4,500 ft. **Prop:** 6 claims: Hazel, Wild Cat, Gumbo, Silver Bell, Silver Horse, Little Creek. **Owner:** H. V. Rieper (1924). **Ore:** Silver, lead. **Ore min:** Galena, silver sulfides, pyromorphite. **Deposit:** Galenaand silver sulfides in quartz. **Assays:** Values chiefly in silver. **Prod:** One lot of ore shipped. **Ref:** 73, p. 102. 97, 1922, p. 256.**Hecla (205)**

(see under copper)

Helena Johnson (81)

(see under lead)

Hi Cliff

(see Uncle Sam under lead)

High Grade (Jay Dee)

(see Jay Dee)

High Grade (Turk)

(see Turk under copper)

Highland (106)

(see under lead)

Homebuilder (48)

(see under lead)

Homestake (45A)

(see under gold)

Honest John (212)**Loc:** Sec. 11, (29-40E), 2 mi. SE. of Springdale, Loon Lk. dist. **Access:** Near road. **Prop:** 3 unpatented claims. **Owner:** Abandoned (1941). Honest John Mining Co. (1897-1902). **Ore:** Silver, lead, gold. **Deposit:** No visible mineralization, though a 5½-ft. vein is reported. **Dev:** 120-ft. adit, small shafts, open cuts. **Assays:** Said to run \$40 Pb, Ag. **Ref:** 30, p. 61. 63, p. 113. 88, p. 8.**Hoodoo (233)**

(see also Deer Trail)

Loc: Sec. 12, (29-37E), Cedar Canyon dist. **Elev:** 3,610 ft. **Access:** 10 mi. SE. of Fruitland by road. **Prop:** 1 claim of the Deer Trail mine. **Owner:** Paso Robles Mining Co. (1949). **Ore:** Silver, lead, zinc, copper. **Ore min:** Pyrite, chalcopyrite, sphalerite, galena, tetrahedrite, malachite, limonite. **Deposit:** Quartz vein 2 to 3 ft. wide in metamorphic rocks near intrusive camptonite dikes. Vein is sparsely mineralized. **Dev:** Adit at least 150 ft. long and said to be 400 ft. long. **Ref:** 7, pp. 117-118. 68, p. 15.**Hope**

(see F. H. and C. under gold)

Hope and Twin Cabins (46)

(see under copper)

Hubbard (60)

(see under lead)

Hunter

(see Jackson under zinc)

I. O. U. (150)**Loc:** Sec. 7, (36-38E), on SE. side of Sunday claim, Kettle Falls dist. **Access:** Road nearby. **Prop:** 1 claim, abandoned 1941. Formerly part of the Hudson Bay group. **Ore:** Silver. **Ore min:** Native silver. **Deposit:** 1-ft. quartz vein in a granite dike appears to be barren but is said to have contained a lens of ore-bearing native silver. **Dev:** 150-ft. adit, two 60-ft. shafts. **Prod:** Probably has produced. **Ref:** 30, p. 57. 164, pp. 232-233.**Ibex (129)**

(see under lead)

Imperial Copper (192)

(see under copper)

Indian

(see Eureka under gold)

International (23)
(see under gold)

Interstate
(see under gold)

Iron Cap
(see Ham under lead)

Iron Horse
(see under gold)

Iron Mask (13)
(see under zinc)

Iroquois (97)
(see under zinc)

Jack and Jill

Loc: Northport dist. **Owner:** Silver Mountain Mining Co. (1935-1936). **Ore:** Silver. **Ref:** 104, 6/15/35, p. 27; 7/30/36, p. 25.

Jackson (101)
(see under zinc)

Jay Dee (Delmonico, Enterprise, High Grade) (190)

Loc: SW $\frac{1}{4}$ sec. 31, (33-41E), $\frac{1}{2}$ mi. SW. of the United Copper mine. **Elev:** 2,515 ft. **Access:** 4 mi. by road NE. of railroad at Chewelah. **Prop:** 6 unpatented claims. **Owner:** Jay Dee Mining Co. (1935-1941). New Dominion Copper Mining & Development Co. (1909). High Grade Silver & Copper Mining Co. (1918). Enterprise Mining Co. (1929-1932). **Ore:** Silver, lead, copper, zinc. **Ore min:** Galena, tetrahedrite, sphalerite, chryso-colla, malachite, azurite, chalcocite. **Deposit:** Small quartz stringers from less than one inch to several inches wide in limestone. Ore minerals sparsely distributed in the quartz. **Dev:** 160-ft. shaft, 100-ft. adit with a 50-ft. winze in the adit. **Assays:** Said to carry high values in Ag. Ore shipped said to have netted \$800 per ton. **Prod:** Some hand-sorted ore shipped. **Ref:** 7, p. 105. 30, p. 31. 97, 1916, p. 614; 1929, p. 428. 98, 1918-1925. 99, 1/8/35. 104, 1/15/32, p. 29; 8/30/34, p. 22; 1/15/37, p. 28. 106, 8/2/29, 5/19/32. 116, no. 2, 1909, p. 54. 158. 164, pp. 144-145.

Jay Gould (199)
(see also Fred B. under lead)

Loc: Near center E $\frac{1}{2}$ sec. 8, (32-41E). **Elev:** 2,700 ft. **Access:** 4 mi. by road E. of Chewelah. **Prop:** Includes Fred B. (Chewelah Silver, Nabob) property. 20 acres of deeded land and 4 claims: Red Jack, McAdoo, North Pole, Jay Gould. **Owner:** O. C. Niles (1941). Travelers Mining & Milling Co. (1908). Jay Gould Mining Co. (1907-1918). New Currency Mining Co. (1918-1922). Chewelah Silver Mining Co. (1922-1926). **Ore:** Silver, lead, zinc, copper, gold. **Ore min:** Galena, pyrite, sphalerite, chalcopyrite, some tetrahedrite, bornite, malachite. **Deposit:** Several large quartz veins and numerous small veinlets in argillite near contact with granite and basic dikes. **Dev:** 200-ft. inclined shaft, from which two levels several hundred feet long have been driven. **Assays:** Dike reported to assay 60¢ or less Au. Ore shipped in 1939 netted \$50 Ag, Pb. **Prod:** Production to 1920 about \$6,200. Shipped in 1939. **Ref:** 7, pp. 106-107. 30, p. 34. 97, 1907, p. 476; 1940, p. 479. 98, 1918-1926. 112, p. 193. 114, no. 5, 1909, p. 57. 116, no. 6, 1908, p. 122. 117, no. 1, 1922, p. 41. 158. 164, pp. 151-152.

Jayhawker (54)
(see under copper)

John Day (W. B. Stuart) (189)

Loc: SE $\frac{1}{4}$ sec. 31, (33-41E), on SW. spur of Eagle Mtn. just SE. of the United Copper mine, Chewelah dist. **Ore:** Silver, lead, copper. **Ore min:** Argentiferous galena, a little chalc-

pyrite and malachite. **Deposit:** A stockwork of small mineralized quartz veinlets in limestone. **Dev:** 120-ft. shaft from which several hundred feet of drifts have been driven. **Assays:** Values principally in silver. **Prod:** Has produced silver ore. **Ref:** 158.

John Hays (162)

Loc: Sec. 22, (34-37E), Summit dist. **Access:** Near road. **Prop:** 3 unpatented claims. **Owner:** John Marty, Kettle Falls, Wash. (1941). **Ore:** Said to be silver, gold, copper, lead. **Deposit:** Quartz vein. **Dev:** 100 ft. of adit. **Ref:** 30, p. 65.

Johnny Boy
(see Moonshine-Johnny Boy)

Juno-Echo (195)
(see under copper)

Jupiter
(see Last Chance under lead)

Just Time (105)
(see under lead)

Katy
(see Blue Grass under gold)

Kemp Komar
(see Loon Lake under copper)

Kettle River (Galena Hill)
(see Galena Hill under lead)

Kettle River (White Elephant)
(see White Elephant under gold)

Key West
(see Loon Lake under copper)

Keystone (88)
(see under iron)

King
(see Edna under copper)

Koyotte
(see Rightside under copper)

Krug (175)
(see under copper)

Lake View
(see Hazel)

Lakeview
(see Roosevelt)

Last Chance (80)
(see under lead)

Lead King (90)
(see under lead)

Leadville (121)
(see under lead)

Legal Tender (231)
(see also Deer Trail)

Loc: Sec. 1, (29-37E), Deer Trail dist. **Prop:** Part of Deer Trail property. **Ore:** Silver, lead. **Ore min:** Argentiferous galena, cerussite, sphalerite, silver sulfide, silver chloride. **Gangue:** Quartz. **Deposit:** Ore occurs in bunches and lenses in quartz veins in a brecciated zone parallel to the bedding of the enclosing argillite. **Ref:** 97, 1912, p. 923. 164, pp. 197-198.

Lem (51)
(see under gold)

Liberty Copper (174)
(see under copper)

Little Frank (235)

(see under lead)

Little Gem

Loc: 3 mi. NW. of Pierre Lk., Orient dist. **Prop:** 4 claims. **Owner:** Lincoln Mining & Development Co. (1897). **Ore:** Silver, gold, copper. **Dev:** 75-ft. shaft. **Assays:** 34 oz. Ag, \$3.60 Au, 5% Cu. **Ref:** 158.

Little Giant (7)

(see under lead)

Lone Star (64)

Loc: Sec. 35, (40-39E), Northport dist. **Access:** ½ mi. from road. **Prop:** 150 acres of patented land. **Owner:** T. T. Richardson, Northport, Wash. (1941). **Ore:** Silver, lead, zinc, gold. **Deposit:** Quartz vein av. 12 to 14 ft. in width has been traced for 1,300 ft. on the surface. **Dev:** 75-ft. inclined shaft. **Prod:** Reportedly shipped to Northport smelter. **Ref:** 30, p. 102.

Longshot (141)

(see under lead)

Loon Lake Copper (210)

(see under copper)

Lottie (43)

(see under copper)

Lucile (98)

(see under zinc)

Lucky Boy (128)

(see under lead)

Lucky Boy (Turk)

(see Turk under copper)

Lucky Charlie (16)

(see under copper)

Lucky Four (89)

(see also Electric Point)

Loc: Sec. 18, (39-42E), Northport dist. **Prop:** Part of Electric Point property. **Ore:** Silver, copper, lead, gold. **Assays:** 1 truck-load shipped in 1934 carried 353 oz. Ag, 1.6% Cu, 1.7% Pb, 0.023 oz. Au. **Prod:** 1934. **Ref:** 99, 12/18/34. 106, 11/34, p. 12.

Lucky Stone (122)

(see under lead)

M. and C.

(see U. S. Copper Gold)

McAdoo (196)

(see under gold)

McDonald

(see Keystone under iron)

McKinley (4)

(see under gold)

McKinley (39)

(see under lead)

McNally (49)

(see under copper)

Magma (133)

(see under zinc)

Maple Leaf

(see Melrose)

Margarete (1)

(see under lead)

Maryland

(see Bonanza Copper under copper)

Melrose (Paragon, Maple Leaf) (92)

Loc: Sec. 28, (40-41E), 4 mi. S. of the town of Boundary. **Elev:** 3,000 ft. **Access:** ½ mi. SE. of the Northport-Boundary highway by truck road. 4 mi. to railroad at Boundary. **Prop:** 3 unpatented claims. **Owner:** Ben Hofer, Northport, Wash. (1941). Paragon Mining & Development Co. (1915). Melrose Mining Co. (1918-1938). **Ore:** Silver, lead, zinc, copper. **Ore min:** Tetrahedrite, galena, sphalerite, pyrite. **Gangue:** Quartz. **Deposit:** 6-ft. vein in argillite contains irregular scattered bunches of ore. **Dev:** 1,600 ft. of underground work on 2 levels. **Assays:** 75 tons shipped prior to 1921 returned a gross value of \$8,000 in Ag. A 3-ton shipment returned 17.5% Zn, 8% Pb, 2.6% Cu, 1.01% Bi, 1.7% Sb, 73.2 oz. Ag. **Prod:** 1913, 1937, 1938. **Ref:** 30, p. 101. 97, 1913, p. 801; 1938, p. 460; 1939, p. 491. 98, 1920-1926. 99, 2/12/35. 104, 6/15/34, p. 29; 1/30/35, p. 23. 106, 6/16/32, 7/6/33. 112, p. 190. 129, pp. 116-117. 141, p. 22.

Mexico

(see Queen)

Michigan (27)

(see under gold)

Michigan Boy (142)

(see under lead)

Middleport (140)

(see under zinc)

Mineral Belt (65)

(see under lead)

Mineral Hill

(see Aichan Bee)

Minnehaha (191)

(see under copper)

Minorca (44)

(see under copper)

Mint

(see under copper)

Monahan (226)

(see under copper)

Monday Morning (135)

(see under lead)

Montana and Washington (8)

(see under copper)

Montgomery (201)

(see under copper)

Moonlite

(see Morning)

Moonshine-Johnny Boy (239)

Loc: Sec. 11, (29-37E), Deer Trail dist. **Access:** Near road. **Prop:** 2 unpatented claims. **Owner:** Barton Brothers, Chico, Calif. (1941). **Ore:** Silver, lead. **Deposit:** Quartz vein av. about 2 ft. in width. **Dev:** 400 ft. of adit, raises, and drifts. Also open cuts. **Ref:** 13, p. 126. 30, p. 69.

Moore (70)

(see under gold)

Morning (Moonlite) (134)

(see also Monday Morning under lead)

Loc: S½NW¼ sec. 4, (37-41E). **Access:** 22 mi. by road to railroad at Colville. **Prop:** 5 unpatented claims. **Owner:** Moonlite Mining Co. (1949). **Ore:** Silver, lead, zinc, cadmium, gold, copper. **Gangue:** Quartz. **Deposit:** Vein said to be 4½ ft. wide and 1,500 ft. long. **Dev:** 150-ft. adit and several other small adits and drifts total about 400 ft. of underground work.

Assays: 6 tons produced in 1948 av. 34% Pb, 30% Zn. Ore av. \$30 Ag, Pb, Zn, Au. Gold values low. **Prod:** 1929, 6 tons in 1948. **Note:** Probably this is the same as the Morning property. **Ref:** 13, p. 127. 30, p. 89. 46, p. 114. 68, p. 14. 97, 1929, p. 428. 110, 7/48, p. 5. 111.

Morning Star

(see under gold)

Mountain View (Contention) (66)

Loc: Sec. 35, (40-39E), on N. side of Squaw Cr., NW. of Providence property. **Elev:** 2,600 ft. **Access:** 3 mi. by road from railroad at Northport. **Prop:** 2 unpatented claims. **Owner:** T. T. Richardson, Ben Hofer, and John Colby, Northport, Wash. (1941). **Ore:** Silver, lead, zinc, copper, gold. **Ore min:** Pyrite, chalcocopyrite, sphalerite, galena, tetrahedrite. **Gangue:** Quartz and reportedly fluorite. **Deposit:** Interbedded limestone and argillite in which are a 1-ft. and a 9-ft. quartz vein. The 9-ft. vein has a 13-in. band of solid sulfides along the footwall. **Dev:** 350-ft. adit, 50-ft. shaft, 30-ft. shaft. **Assays:** 2½ tons av. \$80 per ton. **Prod:** 2½ tons of sorted ore in 1921. **Ref:** 30, p. 91. 46, p. 63. 63, p. 108. 158. 164, p. 314.

Mountain View Extension (67)

Loc: Adjacent to Mountain View property, Northport dist. **Ore:** Silver, gold, lead. **Ref:** 63, p. 108.

Mullen (207)

(see under lead)

Myceerah (110)

(see under lead)

Myrtle

(see under lead)

Nabob

(see Fred B. under lead)

Nellie S.

(see Chewelah Standard under copper)

Nest Egg (32)

(see under gold)

Nevada (215)

(see under lead)

Newland

(see Longshot under lead)

Newport

(see Aguila under lead)

Niles (197)

(see under lead)

Noble Four

(see under copper)

Norman King

(see under lead)

North Monitor (225)

Loc: SW¼ sec. 13, (30-37E), on W. slope of Huckleberry Mtns. **Access:** ½ mi. by trail, 8 mi. by road from Fruitland. **Owner:** Long Lake Lumber Co., Spokane, Wash. (1951). **Ore:** Silver, lead, zinc. **Ore min:** Galena, sphalerite. **Deposit:** Sparsely disseminated galena and sphalerite in limestone. **Dev:** 400-ft crosscut adit, open cuts. **Ref:** 157.

Northern Light (74)

(see under lead)

Northport

(see Deep Creek under zinc)

Norway King

(see under lead)

Oakshott (136)

(see under lead)

Old Abe

(see under copper)

Old Dominion (145)

Loc: Near NW. cor. sec. 9, (35-40E). **Elev:** 2,925 to 3,375 ft. **Access:** 7½ mi. by road from railroad at Colville. **Prop:** 10 patented claims, including: Ella, Reeves, Old Dominion, Ophir Boy, Tillie P. Also 700 acres of deeded land, and 4 unpatented claims: Chickamin, Cheechaco, Friday No. 1 and No. 2. **Owner:** E. B. Gibbs and I. M. Hunley, Colville, Wash. (1949—). Old Dominion Mining & Milling Co. (1892-1918). Dominion Silver-Lead Mining Co. (1918-1928). **Ore:** Silver, lead, zinc. **Ore min:** Galena, cerussite, anglesite, sphalerite, secondary silver sulfides, native silver, stephanite, tetrahedrite. **Gangue:** Quartz, calcite, siderite, dolomite. **Deposit:** Irregular lenticular ore bodies in limestone 6 in. to 10 ft. wide. Ore has been found at places 2,500 ft. apart. Richest ore was near the surface and has largely been mined out. **Dev:** About 8 mi. of workings on at least 11 levels. **Assays:** Shipments from upper workings showed the ore to contain 100 to 400 oz. Ag and 13% to 60% Pb. A 10-ft. width reported to show 98.3 oz. Ag, 12% Pb, 17.4% Zn. Ore contains trace of gallium. **Prod:** More than \$625,000 by 1920. One report says about \$2,000,000 was produced prior to 1897. \$20,000 produced 1924. Produced 1936-1940. **Ref:** 7, pp. 126-130. 12, pp. 12, 26, 72. 13, p. 118. 30, p. 52. 63, p. 112. 73, pp. 120-123. 97, 1907, 1915, 1921, 1923-1925, 1928, 1929, 1935-1941. 98, 1920-1026. 104, 5/15/34, p. 24. 106, no. 16, 1921, pp. 1-2. 112, pp. 176, 195. 141, pp. 20, 22. 158. 164, pp. 171-173.

O-Lo-Lim (246)

(see under copper)

O'Neal

(see Rightside under copper)

Ora

(see under copper)

Orazada (244)

Loc: SE¼NW¼ sec. 27, (29-37E), Deer Trail dist. **Access:** Road. **Prop:** 40-acre Indian Agency lease. **Owner:** West King Mining Co., lessee (1941). Orazada Mines Corp. (1929). **Ore:** Silver, lead, antimony, gold, zinc. **Ore min:** Jamesonite, pyrite, arsenopyrite, galena, sphalerite. **Gangue:** Quartz, barite, calcite. **Deposit:** Narrow mineralized breccia zones in argillite and limestone. Heavy gossan on the surface. **Dev:** 2,400-ft. adit, another adit, open cuts. **Assays:** Said to av. \$15.00 per ton. **Prod:** Test shipment in 1940. **Ref:** 30, p. 67. 46, pp. 110-111. 97, 1928, p. 703. 106, 12/5/29, p. 25. 158.

Orchid (221)

Loc: Secs. 3 and 4, (30-38E), Cedar Canyon dist. **Access:** Near road. **Prop:** 4 claims: Orchid, Laura E., Cyclone, Cornell. **Owner:** Mr. Barton, Fruitland, Wash. (1941). Orchid Mining Co. (1902). **Ore:** Silver, lead, copper, zinc. **Ore min:** Argentite, cerargyrite. **Deposit:** Quartz vein with some calcite and barite. **Dev:** A shaft, adits, drifts aggregating 1,750 ft. **Prod:** 3 tons of high-grade ore shipped in 1900. **Ref:** 30, p. 74. 88, pp. 11-12.

Ore Cache (144)

(see under lead)

Orient Eureka

(see Eureka under gold)

Oro Cache

(see Ore Cache under lead)

Owen

(see Lucile under zinc)

Paragon

(see Melrose)

Payne (198)

(see under copper)

Pedivar**Loc:** Orient dist. **Ore:** Silver, gold. **Ref:** 99, 1/8/35.**Pedro (40)**

(see under gold)

Perry (2)

(see under lead)

Pioneer

(see Longshot under lead)

Plata Fino (240)**Loc:** Sec. 11, (29-37E), Cedar Canyon dist. **Access:** Road. **Prop:** 1 unpatented claim. **Owner:** Barton Brothers, Chico, Calif. (1941). Plata Fino Mining Co. (1918-1920). **Ore:** Silver, lead. **Deposit:** 2-ft. quartz vein. **Dev:** 250 ft. of adit and shaft, caved (1941). **Ref:** 30, p. 71. 63, p. 115. 112, p. 197. 164, p. 190.**Plata Rica (241)****Loc:** Sec. 11, (29-37E), Cedar Canyon dist. **Owner:** Plata Fino Mining Co. (1918-1920). **Ore:** Silver, lead. **Prod:** Has produced. **Ref:** 63, p. 115. 100, 1896, p. 320. 106, 10/1/29. 164, p. 190.**Plug (83)**

(see under zinc)

Pomeroy (52)

(see under zinc)

Pop (37)

(see under copper)

Providence (232)

(see also Deer Trail)

Loc: SE¼ sec. 1, (29-37E), Deer Trail dist. **Prop:** 1 claim of Deer Trail group. **Owner:** Perdiver Mining Co. (1934). Providence Mining Co. (1905-1908). Reata Mining & Milling Co. (1914). Venus Silver Mines Co. (1924-1930). Mining Corp. of America (1924-1930). **Ore:** Silver, lead. **Gangue:** Quartz, calcite. **Deposit:** Ore occurs as tabular bodies and lenses in quartz veins which are parallel to the bedding of the enclosing calcareous argillite, which near the ore is highly brecciated. **Prod:** More than \$50,000 prior to 1914. Produced 1922, 1925, 1928-1930, 1940. **Ref:** 33, 1908, p. 399. 73, pp. 134-136. 97, 1905, 1907, 1911, 1922, 1925, 1928-1930, 1941. 98, 1925, p. 1836; 1926, p. 1599. 104, 10/30/34, p. 22. 105, 2/14, p. 272. 106, no. 15, 1924, pp. 1-2; 9/1/28. 164, p. 201.**Providence (63)**

(see under lead)

Quadra

(see under gold)

Queen (Silver Queen, Queen & Seal, Mexico, Silver Basin, Silver Seal) (238)**Loc:** NE¼SW¼ sec. 11, (29-37E), at head of S. Fk. of Cedar Cr. **Elev:** 3,800 to 3,850 ft. **Access:** 10½ mi. from Fruitland by road. **Prop:** 13 unpatented claims, including: Log Cabin, Queen, Silver Seal Fr. **Owner:** J. G. Glasgow, Hunters, Wash. (1941). Silver Basin Mining Co. (1902-1924). Seal & Queen Consolidated Mining Co. (1907). Silver Glance Mines Development Co. (1929). Commodore Mines Corp. (1928-1931). Silver Seal Mining Co. (1931). Queen & Seal Mining Co. (1935-1939). **Ore:** Silver,lead, zinc. **Ore min:** Argentite, cerargyrite, pyrite, galena, sphalerite, azurite, malachite, native silver. **Deposit:** 1- to 3-ft. quartz lenses in limestone and argillite. Ore now largely stoped out, but parallel ore bodies may occur. **Dev:** 1,370-ft. crosscut adit, 300-ft. shaft with 4 levels, 206-ft. shaft, 125-ft. adit, considerable stoping. **Assays:** Ore av. 150 to 200 oz. Ag in early operations. A 4-ton shipment is said to have netted \$43.76 per ton. **Prod:** \$6,000 in 1917, \$250,000 by end of 1928, 1937, 1938, 1940. **Ref:** 30, pp. 67-68, 70. 73, p. 136. 88, pp. 10-11. 97, 1907, 1908, 1921, 1922, 1929, 1938, 1939, 1941. 98, 1920-1925. 104, 11/30/35, pp. 25-26; 8/15/36, p. 28. 106, 9/1/28; 12/3/28, p. 12; 10/1/29; 1/2/30; 6/18/31; 7/16/31. 112, p. 202. 114, no. 5, 1909, p. 58. 141, p. 22. 158. 164, pp. 193-195.**Queen & Seal**

(see Queen)

R. J. (118)

(see under lead)

Rainbow**Loc:** Northport dist. **Owner:** Silver Crest Mining & Milling Co. (1924-1926). **Ore:** Silver, lead, cobalt. **Ref:** 98, 1925, p. 1832; 1926, p. 1594.**Ranch View (100)**

(see under lead)

Rattler**Loc:** 7 mi. W. of Cedar Canyon. **Ore:** Silver. **Ref:** 63, p. 115.**Reardon Copper**

(see Turk under copper)

Red Cloud (230)

(see under copper)

Red Lion (22)

(see under copper)

Red Sheaf (114)

(see under gold)

Red Top (93)

(see under lead)

Redwood (204)

(see also Eagle)

Loc: Sec. 5, (32-41E). **Access:** 5 mi. E. of Chewelah on W. flank of Pend Oreille Mtns. by road. **Prop:** 1 patented claim and 200 acres of deeded land. Now part of Chewelah Eagle Mining Co. property. **Owner:** Dr. S. P. McPhearson, Chewelah, Wash. (1941). **Ore:** Silver, lead. **Ore min:** Galena. **Gangue:** Quartz. **Deposit:** Ore occurs as a replacement of limestone along zones of fracturing and brecciation. **Dev:** 400-ft. adit on which are a shaft and a raise. **Ref:** 30, p. 34. 164, p. 147.**Regina (50)**

(see under copper)

Rightside (152)

(see under copper)

Rinchaw

(see Middleport under zinc)

Riverview (71)

(see under lead)

Robena

(see Young America under zinc)

Rockcut (15)

(see under lead)

Rocky Creek

(see Burrus under zinc)

Rocky Lake (161)

(see under molybdenum)

Roosevelt (Lakeview) (104)

Loc: Sec. 7, (40-42E), Northport dist. **Access:** 2 mi. from road. **Prop:** 4 unpatented claims. **Owner:** John Citkovitch, Colville, Wash. (1941). **Ore:** Silver, lead, zinc, gold. **Deposit:** Vein about 4 in. wide. **Dev:** 800-ft. adit, 400-ft. adit. **Prod:** 1937. **Ref:** 30, p. 109. 58, p. 59. 63, p. 111. 97, 1938, p. 460.

Rosebud (163)

(see under lead)

Royal

(see Big Chief under lead)

Royal Gold

(see Hubbard under lead)

St. Crispin (69)

(see under gold)

St. Paul-Express

(see under copper)

Sandiego (Good Enough) (224)

Loc: Sec. 18, (30-37E), Cedar Canyon dist. **Access:** Road. **Prop:** 40 acres of deeded land. **Owner:** Henry Troger (1941). **Ore:** Said to be silver and lead. **Dev:** 500 ft. of adit and shaft work, caved (1941). **Ref:** 30, p. 76.

Santa Rita

(see Cleveland under lead)

Saratoga

(see under gold)

Saturday Night-Sunday Morning (242)

(see under lead)

Scandia (78)

(see under zinc)

Schenk

(see Rightside under copper)

Scott (137)

(see under gold)

Seal

(see Queen)

Second Thought (28)

(see under gold)

Security Copper (193)

(see under copper)

Shoemaker (143)

(see under zinc)

Short Wait (62)

(see under lead)

Sierra Zinc (132)

(see under zinc)

Silent Bell

(see Pop under copper)

Silver Basin

(see Queen)

Silver Crest

Loc: Northport dist. **Owner:** Silver Crest Mining & Milling Co. (1924-1926). **Ore:** Silver, lead, cobalt. **Ref:** 98, 1925, p. 1832; 1926, p. 1594.

Silver Crown (75)

(see under lead)

Silver Horde

Loc: Cedar Canyon dist. **Owner:** Silver Horde Mining Co. (1918). **Ore:** Silver. **Ref:** 112, p. 202.

Silver Key

(see Big Chief under lead)

Silver King

(see under lead)

Silver Mountain

(see Daisy-Tempest)

Silver Queen

(see Queen)

Silver Queen (Ark)

(see Ark)

Silver Seal

(see Queen)

Silver Summit (172)

(see under lead)

Silver Trail (115)

(see under lead)

Silver Wave

(see under lead)

Smoky Bullion

(see A and C under copper)

Snowstorm

Loc: Cedar Canyon dist. **Owner:** Silver Basin Mining Co. (1918-1924). **Ore:** Silver. **Ref:** 98, 1925, p. 1831.

Snyder and Baxter

Loc: Springdale dist. **Ore:** Silver, lead, copper. **Prod:** 1908. **Ref:** 97, 1908, p. 581.

Squire

(see under lead)

Star

(see Just Time under lead)

Steel Galena

(see Ham under lead)

Stemwinder (19)

(see under copper)

Sterrett (73)

(see under lead)

Stockwell

(see Columbia Tungsten under tungsten)

Stonewall-Sunnyside (77)

(see under lead)

W. B. Stuart

(see John Day)

Sugar Loaf

(see Vanasse)

Summit

(see Silver Summit under lead)

Sunday (151)

(see under gold)

Sunday Morning

(see Saturday Night-Sunday Morning under lead)

Sunday Morning Star

(see Sunday under gold)

Sunnyside

(see under gold)

Sunnyside (Stonewall-Sunnyside)
(see Stonewall-Sunnyside under lead)

Sunset (72)
(see under lead)

Superior Copper (214)
(see under copper)

Surprise
(see Uncle Sam under lead)

Swamp King (9)
(see under gold)

Syndicate
(see under copper)

Tempest (168)
(see also Daisy-Tempest)

Loc: Sec. 7, (33-38E), Kettle Falls dist. **Prop:** 6 claims: Tempest, Master, Crown Point, Great Eastern, Eureka, Wild Rose. **Owner:** Consolidated Silver Mountain Mines Co., Ltd. (1932-1933). Tempest Mining & Milling Co. (1915-1924). Tempest Consolidated Mines Co. (1924-1926). **Ore:** Silver, gold, copper, zinc. **Ore min:** Sphalerite, chalcopryrite, pyrite. **Gangue:** Quartz. **Deposit:** 2 sparsely mineralized veins 4 and 12 ft. wide in quartzite, argillite, and diorite. **Prod:** Has produced. **Ref:** 73, p. 126. 98, 1922, p. 1667; 1925, p. 1835; 1926, p. 1597. 104, 6/30/33, p. 18; 7/30/33, p. 19. 106, 11/17/32. 129, pp. 140-143. 164, pp. 229-231.

Tenderfoot (Avondale-Dome)
(see Avondale-Dome under lead)

Tenderfoot (Big Chief)
(see Big Chief under lead)

Thomason Queen (180)
(see under copper)

Three Orphans (17)
(see under lead)

Titanic (24)
(see under gold)

Togo (228)
(see under copper)

Tom Moore (11)
(see under lead)

Treadwell
(see Iron Mask under zinc)

Trojan (31)
(see under gold)

Tungsten King (211)
(see under tungsten)

Turk (229)
(see under copper)

Twin Cabins
(see Hope and Twin Cabins under copper)

U. S. Copper Gold (M. and C.) (200)
Loc: SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 8, (32-41E). **Elev:** 2,550 to 2,650 ft. **Access:** 4 mi. by road E. of Chewelah. **Prop:** 2 claims: Expert, Grace. **Owner:** Elmer Mullen, Chewelah, Wash. (1951). Copper-Gold Mining Co. (1907-1920). **Ore:** Silver, copper, gold. **Ore min:** Chalcopryrite, pyrite, malachite, azurite, limonite. **Deposit:** 4-ft. quartz vein cutting metamorphics. **Dev:** 340-ft. adit, a shorter adit. **Assays:** Carload of ore shipped in 1917 reported to assay 4% Cu, 20 oz. Ag, \$2.50 Au. **Prod:** One car in 1917. **Ref:** 7, p. 107. 30, pp. 37-38. 33, 1907, p. 517. 68, p. 17. 163, p. 161.

Uncle Sam (38)
(see under copper)

Uncle Sam (Hi Cliff) (119)
(see under lead)

United Copper (188)
(see under copper)

United Silver Copper
(see United Copper under copper)

United Treasure (107)

Loc: Near center sec. 11, (40-42E), on E. side of Fish Cr., 1 mi. W. of Frisco Standard property, Russian Cr. area. **Elev:** 3,450 ft. **Access:** 11 mi. E. of railroad at Boundary, by Cedar Cr. road. **Prop:** 4 unpatented claims. **Owner:** Singlejack Silver Mining Exploration Co., Wm. and Richard Weaver, Spokane, Wash. (1953—). R. O. Reinertson, Seattle, Wash. (1933-1953). **Ore:** Silver, lead, zinc, copper, gold. **Ore min:** Tetrahedrite, galena, sphalerite, azurite, malachite, pyrite. **Gangue:** Quartz, carbonates. **Deposit:** Irregular vein zone of quartz having a max. width of 4 ft. cuts slates. Thin lamprophyre dike above the vein zone. **Dev:** 1,000 ft. of shallow adits and cuts and one 800-ft. adit. **Assays:** Best values in silver. 2 tons of hand-sorted ore av. 117 oz. Ag per ton. **Prod:** 62 tons in 1917. 2 tons in 1933. 1953. **Ref:** 30, p. 114. 73, pp. 104-105. 97, 1917, 1918, 1926, 1934. 104, 11/30/32, p. 24. 106, 11/17/32, p. 9. 128, pp. 60-61. 129, pp. 114-116. 158. 164, pp. 303-304.

Valley Dew
(see Titanic under gold)

Valley View (169)

Loc: Sec. 7, (33-38E), 4 mi. E. of Daisy. **Ore:** Silver. **Ref:** 158.

Van Stone (131)
(see under zinc)

Vanasse (Sugar Loaf, Victory) (146)

Loc: S $\frac{1}{2}$ NE $\frac{1}{4}$ sec. 10, (36-38E), Kettle Falls dist. **Access:** 1.3 mi. from U. S. Highway 395 on the Mission road. **Prop:** 240-acre State lease. **Owner:** Luther Vanasse, Colville, Wash. (1951—). **Ore:** Silver, gold, lead, copper, antimony. **Ore min:** Chalcopryrite, tetrahedrite, galena, sphalerite, stibnite, bornite, pyrite. **Deposit:** Mineralized quartz veins in arkose and quartzite. Veins from 1 to 6 ft. wide. In general, zinc, lead, and copper minerals predominate. **Dev:** 9 shafts 7 to 20 ft. deep and one 65 ft. deep. Also some bulldozer trenches. Diamond drilling. **Assays:** Assays on picked samples as high as 14% Pb, 6% Cu, \$4.00 Au, 140 oz. Ag. One 16-in. vein shows about 4% stibnite. **Ref:** 30, p. 57. 132, p. 145. 133, p. 41.

Venus
(see Deer Trail)

Victory
(see Vanasse)

Viking (21)
(see under copper)

Vulcan (217)
(see under copper)

Wahkiagin (170)
Loc: Sec. 7, (33-38E), Summit dist. **Owner:** Silver Mountain Mining Co. (1918-1924). **Ore:** Silver. **Ref:** 112, p. 203.

War Eagle (45)
(see under gold)

Washington
(see Montana and Washington under copper)

Wellington

(see under lead)

Wells Fargo (220)

(see under antimony)

Western Molybdenum

(see Juno-Echo under copper)

White Elephant (5)

(see under gold)

White Horse (59)

(see under copper)

Wilkie Lode (183)

(see under lead)

Windfall (208)

(see under copper)

Winslow (182)

(see under lead)

Woohaa

(see Bechtol under lead)

Young America (111)

(see under zinc)

WHATCOM COUNTY**Allen Basin (16)**

(see under gold)

Anacortes (12)

(see under gold)

Azurite (27)

(see under gold)

B. C. & M. (26)

(see under gold)

Beck and Short Grub (17)

(see under gold)

Bismarck (21)

(see under gold)

Bonita

(see New Light under gold)

Boundary Gold

(see Lone Jack under gold)

Brooks-Willis

(see Lone Jack under gold)

Chain Lakes (4)

(see under zinc)

Chancellor (14)

(see under gold)

Crown Point (13)

(see under gold)

Eureka

(see New Light under gold)

Evergreen (7)

(see under gold)

Galena

(see Veronia under gold)

Gargett (6)

(see under gold)

Glacier

(see Midas under copper)

Gold Hill (Northern Cascade, Peterson) (28)

Loc: SW cor. sec. 30, (37-17E), on tributary of Granite Cr., Slate Cr. dist. **Elev:** 4,600 to 5,000 ft. **Access:** 10 mi. from Chancellor on Boulder Cr. trail. **Prop:** 32 unpatented claims and 2 millsites. **Owner:** Northern Cascade Mines, Inc., Wenatchee, Wash. (1940—). Gold Hill Mining Co. (1930-1939). Gold Hill Operating Co. (1935-1936). **Ore:** Silver, gold, lead, zinc, copper, antimony. **Ore min:** Pyrrhotite, sphalerite, galena, pyrite, reportedly argentite. **Deposit:** Shear zones 2 to 8 ft. wide in black argillite are mineralized in places. **Dev:** 4 adits total about 4,000 ft. Also several open cuts and a 20-ft. shaft. **Assays:** High Au, Ag, Pb, Zn assays have been reported, but nothing in the 2 lower adits was seen to support the reports. **Ref:** 46, pp. 232-233. 68, p. 14. 99, 1/29/35. 104, 6/15/32, p. 27; 8/15/35, p. 26; 9/30/35, p. 24; 10/30/35, p. 24; 2/29/36, p. 28; 12/30/36, p. 29. 106, 12/18/30, 9/1/32. 108, 9/40, p. 42. 152. 158.

Gold Run

(see under gold)

Golden Arrow

(see Tacoma under gold)

Great Excelsior (3)

(see under gold)

Indiana

(see Chancellor under gold)

Lambert

(see Lone Jack under gold)

Lestrud

(see Tooker-Lestrud)

Lincoln

(see Great Excelsior under gold)

Lone Jack (8)

(see under gold)

Mammoth (18)

(see under gold)

Midas (1)

(see under copper)

Monica

(see New Light under gold)

Morley B. (25)

(see under gold)

Morovitz

(see under gold)

Mount Baker

(see Lone Jack under gold)

New Light (19)

(see under gold)

Ninety-nine (15)

(see under gold)

North American (20)

(see under gold)

Northern Cascade

(see Gold Hill)

Peterson

(see Gold Hill)

Post-Lambert

(see Lone Jack under gold)

President

(see Great Excelsior under gold)

Rockefeller

(see under gold)

Saginaw (9)

(see under gold)

Shanghai (22)

(see under gold)

Short Grub

(see Beck and Short Grub under gold)

Silver Creek (11)

(see under molybdenum)

Silver Tip (10)

(see under copper)

Slate Creek

(see New Light under gold)

Tooker-Lestrud (2)

Loc: SE¼ sec. 31, (40-8E), Mt. Baker dist. **Access:** On Mt. Baker highway about 1 mi. E. of the Excelsior power house. **Prop:** 9 claims: Waldo Nos. 1 and 2, Partridge, Victory, Liberty Bell, Elnine, Robert Lee, Pay Day, Lucky Adrians. **Owner:** Vernon Lestrud and Ray Tooker, Bellingham, Wash. (1944). **Ore:** Silver. **Ore min:** Pyrite, marcasite. **Deposit:** A zone of oxidized pyrite 10 to 25 ft. or more wide. The pyrite zone is in schistose volcanic rocks and sediments. **Assays:** Spectrographic analysis showed 2.9 oz. Ag. **Ref:** 158.

Tyler

(see Veradell under gold)

Velvet

(see North American under gold)

Veradell (24)

(see under gold)

Verona (5)

(see under gold)

Whistler (23)

(see under gold)

White Swan

(see under gold)

Willis

(see Lone Jack under gold)

Yellow Aster

(see under nickel)

YAKIMA COUNTY

Bear Gap

(see Fife under gold)

Blue Bell

(see Fife under gold)

Chinook (8)

(see under copper)

Comstock (1)

(see under gold)

Copper Mining Co. (11)

(see under copper)

Crown Point

(see under gold)

Damfino (2)

(see under gold)

Dry Spring (3)

(see under gold)

Elizabeth Gold Hill (7)

(see under gold)

Eva

(see under gold)

Fife (4)

(see under gold)

Gold Hill (5)

(see under gold)

Highland (9)

(see under gold)

Lolette (6)

(see under gold)

Manitou

(see Fife under gold)

New Find (12)

(see under copper)

Pickhandle

(see Fife under gold)

Richmond (10)

(see under lead)

SODIUM

Properties—Sodium is a silver-white metal which is lustrous when freshly cut but rapidly darkens in air. It is lighter in weight than water, ductile, malleable, and at room temperatures is nearly as soft as wax but is fairly hard and brittle at -20° C. The metal is a good conductor of heat and electricity, being exceeded in these properties only by silver, copper, gold, and possibly potassium. Weight for weight, it is three times as conductive as copper. Sodium is univalent, and its chemical properties are similar to those of potassium. Except for the silicates, almost all sodium salts are soluble in water. The metal is very reactive, oxidizing rapidly in air, and decomposing water with explosive violence; thus it must be kept in an oxygen-free environment, usually in kerosene. Other properties are shown in the table on page 12.

Uses—The softness and chemical activity of sodium make it unlikely that the metal will have much value

for the structural and mechanical uses characteristic of ordinary metals; however, the metal does have some important chemical uses. Formerly it was used as a reducing agent in producing aluminum and magnesium, and it has been considered for use in producing titanium. It now has important use as a reducing agent in making tetraethyl lead, vat-dye indigo, and in other organic syntheses. The metal has minor uses in sodium-vapor lamps, as a scavenger, to desulfurize petroleum, to dehydrate ether, and as an amalgam with mercury in platinum mining to recover platinum, which does not amalgamate with mercury alone. The metal has a low melting point, and the liquid can be used as a heat-transfer medium in power plants. Very minor use has been made of sodium alloys, but sodium salts have a great many very important industrial uses.

Production—Metallic sodium production in the United States rose from some 5,000 tons in 1929 to an estimated 8,000 to 10,000 tons in 1945. In 1950 there were two producing plants, one in Delaware and one in New York City. Washington has had a very small production of sodium salts, and in 1945 approximately 20,000 pounds of sodium metal was produced at the plant at Mead which was originally built for the production of magnesium.

Prices—In the 1880's, when sodium metal was used in the production of aluminum, it sold at about \$3.40 per pound, but later the price dropped considerably, and during World War I it was about 30 cents per pound. The price had dropped to 26¼ cents by 1921 and to 15 cents by 1929. The 1945 price was 15 cents per pound, in drums, in carload lots, and the average price for 1951 was 16½ cents, which also was the price quoted in June 1955.

Ore minerals and geology—Sodium makes up more than 2.8 percent of the earth's crust, mostly in the form

of silicates, in which it is not economically available for extraction. The solids dissolved in sea water are about two-thirds sodium chloride. Common soluble sodium minerals are halides, carbonates, and sulfates. Most sodium compounds and probably all sodium metal are made from common or rock salt, which is sodium chloride, NaCl, containing 39.4 percent sodium. Halite (the mineral name for common salt) in Washington occurs only as a mineral curiosity in infinitesimal quantity at Sulphate Lake, Grant County. Sodium carbonate and sulfate minerals found in the state are mirabilite, $\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$; thenardite, Na_2SO_4 ; trona, $\text{Na}_2\text{CO}_3 \cdot \text{NaHCO}_3 \cdot 2\text{H}_2\text{O}$; and natron, $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$. These are soluble salts which have accumulated by evaporation of closed-basin lakes. Some salt waters have been encountered in deep wells in the state, but none of the brines have been concentrated enough to appear to have value as a source of sodium compounds.

OCCURRENCES

Occurrences of sodium carbonate and sodium sulphate minerals are described under saline compounds in Part I of this report.

STRONTIUM

Properties—Strontium is a hard silver-white metal which quickly becomes yellow on exposure to air. It is photoelectric and reacts readily with oxygen and water. Strontium, barium, and calcium make up the group of metals known as the alkaline-earth metals. They and their compounds are very much alike chemically and physically. Strontium is always bivalent. Its salts give a brilliant crimson color to a flame. Other properties are shown in the table on page 12.

Uses—About the only use of strontium metal is in blue-green-sensitive photoelectric cells and in alloys with barium, aluminum, and magnesium which are used as "getters" to remove residual gases from evacuated electronic tubes. Strontium compounds are used for red signal flares, fireworks, and tracer bullets. Other uses are in medicines, iridescent glass, sugar refining, pigments, as a filler, and as a substitute for barite as a weighting agent in oil-well drilling mud. Strontianite has been used for desulfurizing and dephosphorizing steel.

Production—In 1950 there were reported only two domestic producers of the metal. These were in Cleveland,

Ohio, and Syracuse, New York. The Alverson strontianite-celestite deposit in western Skagit County has had intermittent small production, but no strontium metal has ever been produced in this state.

Prices—Strontium metal sold at from \$15 to \$30 per pound from 1943 to 1945. In 1949 and 1950 strontium was quoted at \$10 per pound in 500-pound lots for cast billets and \$11 per pound for extruded rods. In 1951 prices quoted were from \$7.50 to \$35 per pound, probably depending upon purity.

Ore minerals and geology—Although at least ten strontium minerals are known, the only two which are ores of the element are the sulfate, celestite, SrSO_4 , containing 56.4 percent SrO, and the carbonate, strontianite, SrCO_3 , containing 70.2 percent SrO. Celestite occurs as a gangue mineral in hydrothermal veins, as disseminated replacement deposits in limestone, as sedimentary beds, and as a chemical precipitate which may or may not be associated with saline minerals. Strontianite occurs as a secondary alteration product of celestite and as veins and nodules in limestone, marl, and shale.

OCCURRENCES

Occurrences in Washington of strontianite and celestite, the ore minerals of strontium, are described under

miscellaneous nonmetallic minerals in Part I of this report.

TANTALUM

See columbium (niobium) and tantalum on page 44.

TELLURIUM

Properties—Tellurium is a semi-metallic member of the sulfur group of elements, and like the other members of the group it is allotropic, occurring in a crystalline and an amorphous form. The amorphous form is as dark gray to brown lustrous powder, and the other form is as silver-white lustrous brittle metallic crystals. In its chemical reactions it is similar generally to sulfur and selenium. Other properties are shown in the table on page 12.

Uses—Tellurium may be substituted for selenium in many applications. Its chief use is in rubber goods, to increase tensile strength and resistance to heat and abrasion. In metallurgy it is used to improve the machining qualities of certain steels; to harden, strengthen, and add acid-resistance to lead and lead alloys; as a substitute for chromium, to produce wear-resistant surfaces on cast iron; to make special alloys of marked electrical resistance; and in making thermocouples. Added to copper and copper alloys, tellurium improves machinability without inducing hot-shortness. It is used to remove cobalt from zinc solutions prior to electrolytic deposition of zinc, and a tellurium reagent is used to produce a black finish on silverware. Tellurium is used in staining glass and china, and has restricted use in toning photographic prints and in electrical rectifiers. Of historical interest are past uses as crystal detectors in radios and as diethyl telluride in high-octane gasoline, the latter use now being taken over by tetraethyl lead.

Production—The United States output comes from four plants in Maryland, New Jersey, and Indiana. It is a by-product of lead smelting, and, with selenium, is recovered in electrolytic refining of copper. United States production of tellurium during the period 1940 to 1950 varied greatly from year to year but averaged about 100,000 pounds per year. Tellurium is not produced in Washington.

Prices—From 1920 to 1936 the price of tellurium remained at \$2 per pound or a little more, and since that time it has remained practically steady at \$1.75 per pound.

Ore minerals and geology—Most tellurium occurs as impurities in other ores, especially in chalcopyrite copper ores, but it has been found associated with selenium in solfataric deposits. Tellurium occurs sparsely in the free state associated with gold and silver, but it is usually combined with gold, silver, lead, bismuth, nickel, and copper as tellurides. It is one of the few elements that combine with gold. Secondary tellurium minerals are the oxide and a few rare tellurates or tellurites. Some of the better known tellurides are sylvanite, (Au,Ag)Te₂, containing 58 to 62 percent tellurium; petzite, (Au,Ag)₃Te₄, containing 32 to 35 percent tellurium; calaverite, AuTe₂, containing 56 to 58 percent tellurium; and tetradymite, Bi₂Te₃, containing 39 to 49 percent tellurium.

OCCURRENCES

The map showing the numbered tellurium occurrences is plate 18, on page 47 in volume 2.

FERRY COUNTY

- Ada**
(see Laura S. under lead)
- Grandview (3)**
(see under lead)
- Knob Hill (1)**
(see under gold)
- Laura S. (4)**
(see under lead)
- Morning Glory (2)**
(see under gold)
- Old Gold**
(see Morning Glory under gold)

KANOGAN COUNTY

- Bellevue (2)**
(see under gold)
- Calumet (1)**
(see under gold)
- Wolverine (3)**
(see under gold)

TEVENS COUNTY

- Beecher (1)**
(see under gold)

WHATCOM COUNTY

- Anacortes (5)**
(see under gold)
- Bonita**
(see New Light under gold)
- Boundary Gold**
(see Lone Jack under gold)
- Brooks-Willis**
(see Lone Jack under gold)
- Eureka**
(see New Light under gold)
- Great Excelsior (1)**
(see under gold)
- Lambert**
(see Lone Jack under gold)
- Lincoln**
(see Great Excelsior under gold)
- Lone Jack (2)**
(see under gold)
- Lone Star (3)**
(see under gold)
- Mammoth (6)**
(see under gold)
- Monica**
(see New Light under gold)
- Mount Baker**
(see Lone Jack under gold)

New Light (7)
(see under gold)

Ninety-nine (8)
(see under gold)

Post-Lambert
(see Lone Jack under gold)

President
(see Great Excelsior under gold)

Slate Creek
(see New Light under gold)

Tacoma (9)
(see under gold)

Terra Alta (4)
(see under gold)

Willis
(see Lone Jack under gold)

THORIUM

Properties—Thorium is a soft heavy gray metal which is malleable and difficultly fusible. It is strongly radioactive, emitting alpha, beta, and gamma rays. It is very resistant to chemical action and in many respects resembles platinum, but its chemical compounds are analogous to those of zirconium. Other properties are given in the table on page 12.

Uses—Formerly, and even yet, the greatest use of thorium was for treating gas-light mantles to improve their light-giving quality. An important present use for thorium is for electron-emissive elements in radio tubes. Thorium is alloyed with tungsten for use in electric-light filaments. It is used in high-temperature refractories, in polishing compounds, as X-ray targets, as a catalyst, and in medicine. It has limited use in optical glass. Alloyed with magnesium it adds strength, and to resistance-heating alloys it adds longer life. Thorium is a radioactive metal which is a potential source of nuclear energy.

Production—In 1950 a few tens of thousands of pounds of thorium compounds were produced in the United States, mostly by two plants, one in Illinois and the other in New Jersey. Thorium metal production was negligible. The production of thorium compounds was as a byproduct of the recovery of cerium and other rare earths from monazite—just the reverse of the situation some years ago, when there was little demand for cerium but thorium was used in much larger quantities in gas-mantle manufacture.

Prices—Thorium metal prices are seldom quoted, but the 1951 price varied between \$159 and \$318 per pound. Thorium nitrate was quoted in 1950 at \$3.50 per pound, at which price it has been since the latter part of 1947,

before which it was \$2.00. In 1950 thorium oxide, 97 percent ThO_2 , was \$5.00 per pound, and 99 percent ThO_2 was \$10.00 per pound. In 1955 the Atomic Energy Commission was offering about \$4.00 per pound for ThO_2 in material concentrated to 50 percent ThO_2 and was buying mechanical concentrates of thorium minerals (other than monazite) containing 10 percent or more ThO_2 . Quotations on monazite sand, 8 percent minimum ThO_2 , dropped from a high of \$252 per ton in 1920 to a low of \$50 in 1933 and then rose to \$60 and remained there through 1946. Increased interest in thorium and restriction of foreign supplies initiated a price rise in 1947 which had brought the price to \$340 per ton by 1950.

Ore minerals—The principal ore mineral of thorium is monazite, the rare earth phosphate $(\text{Ce,La,Di})\text{PO}_4$, which almost always contains some thorium, probably as a silicate. The thorium content commonly is from 3 to 10 percent, but as much as 26 percent has been reported. Monazite is found in Washington, and another thorium-bearing mineral which has been reported in the state is allanite (orthite), a complex silicate of aluminum, iron, calcium, and rare earth, which contains up to 3.5 percent ThO_2 . Seventy or more minerals contain thorium in small to large percentages. These minerals are silicates, oxides, phosphates, fluosilicates, titanates, and columbo-tantalates. Of these, the silicates are most numerous.

Geology—Monazite is widely but sparsely distributed in granites, gneisses, and pegmatites. The mineral is almost always disseminated and rarely makes up more than a very small fraction of 1 percent of the host rock. The only common type of concentration is in placer stream gravels and beach sands.

OCCURRENCES

The map showing the numbered thorium occurrences is plate 18, on page 47 in volume 2.

DOUGLAS COUNTY

Columbia River Placer
(see under gold, placer)

FERRY COUNTY

Sherman Creek Pass (2)
(see under uranium)

Wilmont Bar Placer (1)
(see under gold, placer)

GRAYS HARBOR COUNTY

Moclips Placer (1)
(see under cerium)

KING COUNTY

Seattle Placer
(see under gold, placer)

Snoqualmie

Loc: Within the area of the Snoqualmie folio, near Snoqualmie Pass, in eastern King County. **Ore:** Thorium, cerium, uranium (?). **Deposit:** A little allanite occurs as an accessory mineral in the Snoqualmie granodiorite. **Ref:** 146, p. 9.

OKANOGAN COUNTY

Happy Hill (1)

(see under uranium)

PEND OREILLE COUNTY

Dry Canyon (1)

Loc: In Dry Canyon, which is 2 to 3 mi. E. of Pend Oreille R. The canyon is 10 mi. long, and its N. end is 3 mi. E. of Ione.

Properties—Tin is a very soft, very malleable, ductile metal having only slight tenacity and exhibiting an attractive lustrous silver-white color. It is easily fusible and alloys readily with other metals. It is corrosion resistant and at ordinary temperatures is only very slightly acted upon by air or water. Tin has three crystal-line forms. The ordinary form is unstable below 18° C., and at lower temperatures it crumbles to a gray powder. This change is known as the "tin disease" or "tin plague." Other properties are shown in the table on page 12.

Uses—In 1950 the largest use for tin was in tin plate, which accounted for 34 percent of the total. Other important uses were in solder (27 percent), bronze and brass (20 percent), and babbitt (6 percent), followed in decreasing order of importance by tinning, type metal, chemicals, miscellaneous alloys, collapsible tubes and foil, bar tin, terneplate, and pipe and tubing.

Production—In the United States, production of tin is negligible, amounting to only a small fraction of 1 percent of the consumption. Most of this production comes from Alaska, although a little recovery is made from the traces of tin which are found in the Climax molybdenum ore. A Government-owned smelter has been operating at Texas City, Texas, since 1941, but prior to that time there were no smelting facilities in the United States. Although tin is known to occur in a few places in Washington, to date there has been no production. However, 150 tons of ore estimated to carry 6 percent tin were mined but not shipped in 1907 from the Silver Hill property a few miles south of Spokane.

Prices—Tin prices have fluctuated over a wide range in the past 60 years, from a low average annual price of 13.7 cents per pound in 1897 to a high of \$1.28 in 1951. During the war years, 1941 to November 1946, the price

Ore: Thorium, cerium, uranium (?). **Ore min:** Allanite. **Deposit:** Allanite is present in a 4-ft. dike as platy crystals as much as ½ in. long. The crystals are surrounded by a reddish halo ¼ to ¼ in. wide **Ref:** 128, p. 58.

TIN

was held by Government order at 52 cents. The price continued to be Government-regulated for some time thereafter but rose by steps to \$1.03 by September 1949. Twelve decreases brought the price down to 74.12 cents per pound by February 1950, but a year later the price was up to an all-time high of \$1.82, only to drop back to \$1.03 by August of the same year, and rise again to \$1.21½ by January 1952, where it remained for more than a year. The 1954 price averaged about 90 cents, and the price in June 1955 was 94½ cents per pound.

Ore minerals—Tin very rarely occurs native. There are only two important ore minerals of tin, and of these by far the more important is the oxide, cassiterite, SnO₂, containing 78.6 percent tin. The other is the copper-iron-tin sulfide, stannite, Cu₂S·FeS·SnS₂, containing 27.5 percent tin. At least nine other tin minerals are known, but only one of these—the lead-tin sulfide, teallite, PbSnS₂—is found in sufficient quantity, and then rarely, to be mined as tin ore.

Geology—All primary tin deposits are genetically related to siliceous igneous rocks such as granites or pegmatites. Tin occurs rarely in contact metamorphic deposits, but most primary tin deposits are pegmatites or hydrothermal or pneumatolitic veins which have formed under high temperature and pressure at great depths. Tin minerals are commonly associated with tungsten and molybdenum, and gangue minerals are quartz, fluorite, tourmaline, or muscovite. Because cassiterite is resistant to alteration and has high specific gravity it is readily concentrated in placer deposits, and about 75 percent of the world's tin production is from such deposits. Tin placers commonly carry 0.4 to 5 pounds of tin per cubic yard, and lode deposits usually run from 1 to 8 percent tin. The sulfide vein deposits in Bolivia carry 1 to 2 percent tin.

OCCURRENCES

The map showing the numbered tin occurrences is plate 21, on page 55 in volume 2.

CHELAN COUNTY

Blewett (3)

Loc: Sec. 12, (22-17E), Blewett dist. **Owner:** Tin Exploration Co., William H. Hooper and associates, Seattle, Wash. (1951-1952). **Ore:** Tin, tungsten. **Ore min:** Native tin, scheelite. **Deposit:** Metallic tin and scheelite reported in serpentinized peridotite. Report not verified. **Ref:** 157, 158.

Chelan Butte (1)

Loc: On Chelan Butte. **Ore:** Tin. **Deposit:** Doubtful occurrence. **Ref:** 105, no. 19, 1907, p. 584; no. 26, 1907, p. 807; 12/09, p. 773.

Monitor (2)

Loc: Sec. 23, (23-19E), near Monitor. **Ore:** Tin. **Deposit:** Tin is reported in an andesite dike, but the occurrence is doubtful. **Ref:** 111.

Peshastin Creek

Loc: On Peshastin Cr., near base of Mt. Stuart. **Ore:** Tin. **Deposit:** Doubtful occurrence. **Assays:** 4% to 8% Sn. **Ref:** 43, 11/91, p. 541.

CLALLAM COUNTY

Bright Angel (1)

(see under manganese)

KING COUNTY

Bear Basin (2)
(see under silver)

Skykomish (1)

Loc: Road cut on Stevens Pass highway at E. end of Skykomish, probably in sec. 26, (11-26E). **Ore:** Tin. **Ore min:** Cassiterite. **Deposit:** 1% cassiterite in conglomerate of the Swauk formation. **Ref:** 170, p. 37.

KITSAP COUNTY

Chico (Cook-Kitchen) (1)

Loc: Near Wildcat Lk. **Access:** 4 mi. by road from Chico. **Prop:** 26 claims. **Owner:** Cook Kitchen Mining Co. (1897). **Ore:** Tin. **Ore min:** Cassiterite, wolframite, arsenopyrite, malachite. **Gangue:** Mica, tourmaline. **Deposit:** Deposit 400 ft. wide in slate and schist. **Dev:** 4 shafts, 25 to 80 ft. deep. **Assays:** 4.75% Sn, 39.75 oz. Ag, \$3.72 Au, 5.25% Cu. **Note:** This report has never been substantiated and is probably entirely erroneous. **Ref:** 63, p. 60. 105, 11/95, p. 306.

Cook-Kitchen
(see Chico)

Kitchen
(see Chico)

OKANOGAN COUNTY

Omak (1)

Loc: Just N. of American Graphite claims, which are in sec. 27, (34-29E). **Ore:** Tin reported. **Assays:** High percentage reported. **Ref:** 158.

PEND OREILLE COUNTY

Blueside (1)

Loc: Secs. 5, 8, 9, 15, 16, 21, and 22, (35-43E), along Ruby Cr. **Ore:** Tin. **Deposit:** Placer tin reported in bars of the stream for 2½ mi. **Ref:** 157.

SNOHOMISH COUNTY

Hoodoo (1)
(see under copper)

Ore Recoveries
(see Hoodoo under copper)

Snohomish Placer (2)

Loc: Near Snohomish. **Ore:** Tin reported. **Ore min:** Placer tin. **Ref:** 14, p. 51. 105, 10/03, p. 295.

TITANIUM

Properties—Titanium is a lustrous silver-white metal which has a combination of properties giving it great potential value. It is light in weight, corrosion resistant, strong, and heat resistant. It is only 56 percent as heavy as steel and only 60 percent heavier than aluminum; it is as resistant to corrosion as stainless steel; its tensile strength and hardness approach that of steel; and its melting point is 300° F. higher than that of iron. Titanium is unique among the common engineering metals in its complete immunity from deleterious effects of salt water and marine atmosphere. It has the greatest resistance to shock of any known metal, retains its strength at high temperatures, has low coefficient of expansion at high temperatures, is tough and strong, but is ductile only

SPOKANE COUNTY

Silver Hill (1)

Loc: Secs. 23 and 24, (24-43E), on Silver Hill. **Elev:** 2,900 ft. **Access:** 11 mi. of good road from Spokane. Property is crossed by railroad. **Prop:** Deeded land. **Owner:** Spokane Tin Co., Spokane, Wash. (1943). Spokane Tin Mines Co. (1907-1935). Spokane Tin and Tin Co. (1919-1922). **Ore:** Tin, tungsten, silver, lead. **Ore min:** Scheelite, wolframite, cassiterite, argentiferous galena. **Gangue:** Quartz, feldspar, andalusite, sillimanite. **Deposit:** 8 pegmatite and quartz veins in schist and quartzite av. 160 ft. in length, 3 ft. in width, and 40 ft. in depth. **Dev:** Several shafts and adits, 9,040 ft. of trenches, and 8 test pits. **Assays:** Veins av. 0.5% WO₃, 3% Sn in places. U. S. Bureau of Mines development work indicated small tonnage of 0.5% WO₃ ore. **Prod:** 125 tons of tin ore mined but not shipped. **Ref:** 2, 27, pp. 295-305. 37, pp. 57-58. 42, vol. 7, p. 212. 78, p. 27. 96, vol. 16, 1907, p. 862. 97, 1910, p. 751. 98, 1920-1926. 105, vol. 94, 1907, p. 584; vol. 94, 1907, pp. 697-698; vol. 94, 1907, p. 742; vol. 95, 1907, p. 49; vol. 96, 1908, p. 536; vol. 99, 1909, p. 871. 107, vol. 29, 1908, p. 852. 111. 112, p. 204. 116, 5/07, p. 20; no. 8, 1908, p. 13; 5/08, p. 126. 120. 158. 166.

STEVENS COUNTY

Dumbolton (3)
(see under gold)

Frisco Standard (1)
(see under silver)

Loon Lake
(see Tungsten Products under tungsten)

Tungsten Products (4)
(see under tungsten)

Young America (2)
(see under zinc)

WALLA WALLA COUNTY

Mill Creek Placer

Loc: At Mill Cr., 12 mi. E. of Walla Walla. **Ore:** Tin reported. **Deposit:** This reported occurrence is most doubtful. **Ref:** 105, 5/07, p. 584.

when very pure and free of oxygen. At ordinary temperatures it is hard and brittle but when hot it is malleable. Liquid titanium reacts with almost everything with which it comes into contact. It forms alloys with aluminum, chromium, cobalt, copper, iron, lead, nickel, tin, and other metals. Other properties are shown in the table on page 12.

Uses—Prior to 1950 about 99 percent of the titanium ore produced went into the manufacture of titanium dioxide, used extensively for white pigments, and the remainder was used in welding-rod coatings, ceramics, titanium carbides, and titanium alloys. The metal's desirable characteristics have stimulated great interest, especially in the aircraft industry, where it is being used

as sheet in jet engine shells and in various structural parts. Titanium is used in certain high-strength aluminum and magnesium alloys, in some steel alloys, and with copper and iron in titanium bronze. It is expected that with decreased production costs, higher purity metal, and improved fabricating techniques the metal will have very greatly expanded uses in the near future.

Production—The production of titanium metal is still in its infancy but is expanding rapidly and is expected to increase one-hundred-fold or more within the next few years. In 1946 less than 100 pounds of the metal was made; the following year less than 1,000 pounds was made; and it was not until 1948 that titanium metal was produced commercially. Production amounted to 30 tons in 1949 and was 550 tons in 1951, 1,100 tons in 1952, 2,241 tons in 1953, and 5,300 tons in 1954. The only production in the western part of the United States has been at a plant at Henderson, Nevada.

Prices—Some of the first commercially produced titanium metal sold for as high as \$7.00 per pound in 1948, but the price dropped to \$5 the same year and remained at that figure through 1953. In June 1955 the price was \$3.50 per pound for titanium containing a maximum of 0.5 percent iron. This price corresponds to that of aluminum 60 years ago or magnesium 45 years ago, and if improved production methods can be developed so that titanium prices can be brought down to a competitive level, demand for the metal may be expected to expand tremendously. Ilmenite titanium ore, containing 56 to 59 percent TiO_2 , sold for \$14 to \$16 per gross ton, f.o.b. Atlantic seaboard, in 1950 and had risen to \$18 and \$20 by 1953. Rutile ore, containing 94 percent or more of TiO_2 , sold as low as $3\frac{1}{2}$ to $4\frac{1}{2}$ cents per pound in 1950 but was at 5 to 6 cents in 1953.

Ore minerals—More than 60 minerals contain titanium, but about 97 percent of the titanium ore mined is the iron

titanate, ilmenite, $FeTiO_3$, which contains 31.6 percent titanium. The other 3 percent mined is the oxide, rutile, TiO_2 , containing 60.0 percent titanium, although some of the ore marketed as rutile actually is a crystal modification, brookite, or more rarely another modification, octahedrite (anatase). Similarly, some ore called ilmenite probably is a closely allied mineral, arizonite. Furthermore, much ilmenite is partially altered to leucoxene. Other minerals which occasionally occur in quantities large enough to be mined are the calcium titanate, perovskite, $CaTiO_3$, containing 58.9 percent titanium, and the calcium titanate-silicate, titanite (sphene), $CaTiSiO_5$, containing 40.8 percent titanium. Magnetite is often titaniferous, containing from 3 to 15 percent titanium, but in these instances the result usually is that the magnetite is too high in titanium to be acceptable as iron ore and too low in titanium to be usable as a source of that metal.

Geology—Titanium is the ninth most abundant element in the earth's crust and is the fourth most abundant metallic element suitable for engineering uses, being exceeded only by aluminum, iron, and magnesium. It is present in almost all igneous rocks and in sedimentary and residual rocks derived from them. Most of the world's large primary deposits of titanium are associated with basic igneous rocks, such as anorthosite, gabbro, and pyroxenite, but some are found in other rocks, such as syenite and metamorphic rocks. Minor occurrences are found in quartz veins. A large part of the titanium mined is in black sands in beach placers derived from primary deposits and from accessory titanium minerals in igneous, metamorphic, and sedimentary rocks. Accessory titanium minerals are sometimes concentrated also in residual clays or laterites derived from other rocks. Titanium has been reported in most, if not all, of these types of deposits in Washington, but to date none has been proven to be commercial.

OCCURRENCES

The map showing the numbered titanium occurrences is plate 21, on page 55 in volume 2.

ASOTIN COUNTY

Clarkston Placer (1)
(see under gold, placer)

Snake River Placer
(see under gold, placer)

CHELAN COUNTY

First Creek (1)
Loc: On First Cr. ridge approx. $\frac{1}{4}$ mi W. of the highway and 2 mi. W. of Lk. Chelan, probably in sec. 8, (27-21E). **Ore:** Titanium, iron. **Ore min:** Ilmenite. **Ref:** 67, p. 26.

CLALLAM COUNTY

Cedar Creek Placer (3)
(see under gold, placer)

Lovelace Placer
(see Shi Shi Beach Placer under gold, placer)

Shi Shi Beach Placer (1)
(see under gold, placer)

Starbuck Placer

(see Cedar Creek Placer under gold, placer)

Yellow Banks Placer (2)

(see under gold, placer)

CLARK COUNTY

Brush Prairie Placer (1)
(see under gold, placer)

Camas Placer (2)

Loc: Near Camas. **Ore:** Titanium, gold. **Ore min:** Ilmenite, magnetite, free gold. **Gangue:** Quartz. **Deposit:** Placer "black sands." **Assays:** A sample of concentrate showed 1,282 lb. ilmenite, 90 lb. magnetite, \$1.34 Au per ton (1905). **Ref:** 38-A, pp. 1218-1219. 126, p. 14.

DOUGLAS COUNTY

Columbia River Placer
(see under gold, placer)

FERRY COUNTY

Wilmont Bar Placer (2)
(see under gold, placer)

Wilmont Creek (1)

Loc: On N. slope from W. tributary of upper Wilmont Cr., probably in sec. 6, (31-35E). **Access:** 3 mi. by trail plus 19 mi. by road from Impach. **Prop:** Indian Reservation land. **Owner:** Deposit discovered by A. E. Wilson in 1906. **Ore:** Titanium. **Ore min:** Ilmenite. **Deposit:** Granite cut by 3 dikes or veins of quartz containing low percentage of coarse ilmenite; also muscovite, biotite, and feldspar. **Dev:** Open cuts, caved adit (1943). **Assays:** A dike with max. thickness of 8 ft. est. to contain 2% to 3% ilmenite. A 40- to 50-ft.-wide dike is nearly barren. **Prod:** 5 tons of mineral reported shipped to Essen, Germany. **Ref:** 122, p. 151. 158.

GARFIELD COUNTY**Pomeroy Placer**

(see under gold, placer)

GRAYS HARBOR COUNTY**Damons Point Placer (1)**

Loc: Damons Point, on the ocean beach. **Ore:** Titanium, gold. **Ore min:** Ilmenite, free gold, zircon. **Gangue:** Quartz, garnet. **Deposit:** Beach placer. **Assays:** Large sample showed 689 lb. ilmenite, 43 lb. zircon, \$0.05 Au per ton. **Ref:** 38-A, pp. 1216-1217. 126, pp. 13-14.

Dennis

(see Elma under iron)

Elma (2)

(see under iron)

KING COUNTY**Northwestern Realty**

(see Rainy under gold)

Rainy (1)

(see under gold)

Western States Copper

(see Rainy under gold)

KITTITAS COUNTY**Big Z**

(see Zerwekh under gold)

Zerwekh (1)

(see under gold)

LEWIS COUNTY**Winlock Placer (1)**

Loc: On small stream near center of sec. 27, (12-2W), about 1 mi. E. of Winlock. **Owner:** Art Gates, Toledo, Wash. (1952). **Ore:** Titanium. **Ore min:** Ilmenite. **Gangue:** Sand. **Deposit:** A sample of sand from a small stream channel contained about 10% ilmenite. **Ref:** 158.

OKANOGAN COUNTY**Crouse Placer (3)**

(see under gold, placer)

Fuller (2)

(see under iron)

Lone Pine

(see Fuller under iron)

Pateros

(see Fuller under iron)

Similkameen Falls Placer (1)

(see under gold, placer)

Strawberry Creek Placer

(see Crouse Placer under gold, placer)

PACIFIC COUNTY**Beards Hollow Placer (1)**

(see under platinum)

Fort Canby Placer (2)

(see under gold, placer)

McGowan Placer (4)

(see under iron)

Sand Island Placer (3)

(see under gold, placer)

SNOHOMISH COUNTY**Pilchuck Creek (1)**

(see under iron)

SPOKANE COUNTY**Excelsior (1)**

Loc: Secs: 20, 21, 22, 23, 28, and 29, (24-44E), just W. of Mica. **Elev:** 2,450 to 2,600 ft. **Access:** 15 mi. by road to center of Spokane. Three railroads cross the deposit. **Prop:** Deposit covers 478 acres. **Ore:** Titanium. **Ore min:** Ilmenite, kaolinite. **Deposit:** High-alumina residual basaltic clay containing an av. of 7.1% TiO₂, covers 478 acres to av. depth of 17.4 ft. and has an av. of 21.4 ft. of unconsolidated overburden. **Dev:** 139 drill holes having total footage of 4,633 ft. drilled by U. S. Bureau of Mines in 1943-1944. **Assays:** Deposit av. 7.1% TiO₂, 28.71% available Al₂O₃, 5.59% available Fe₂O₃. **Reserves:** Drilling outlined 12,533,000 dry tons of indicated ore containing 890,000 tons of TiO₂. **Ref:** 137. 148-A.

STEVENS COUNTY**Marcus Placer (1)**

(see under gold, placer)

TUNGSTEN

Properties—Tungsten is a light-gray to brownish-black metal in its powdered form but is brilliant white when fused. No other element is known to have a lower vapor pressure or higher tensile strength, and only carbon has a higher melting point. Tungsten is one of the heaviest of metals, its density being almost twice that of lead. It is very hard, ductile, strong, and elastic. It conducts heat fairly well, is very stable in acids, and is resistant

to chemical action. In artificial compounds it shows valences of 3, 4, 5, and 6, but in its only important natural minerals it has a valence of 6. Other properties are shown in the table on page 12.

Uses—About 90 percent of the tungsten consumption is in ferroalloys, mostly high-speed tool steel; 5 percent goes into tungsten carbide; and the remainder, into non-

ferrous alloys, unalloyed tungsten metal, and chemicals. The pure metal is used in electric lamp filaments, for which use no satisfactory substitute is known. It is also used for plating special laboratory equipment, for contact points in electrical apparatus, and as a catalyst in certain industrial chemical reactions. The metal's greatest value lies in its property of imparting increased hardness, toughness, elasticity, and tensile strength to steel, but perhaps its most remarkable property is that of making steel retain its hardness when hot, even at red heat. Of the many nonferrous tungsten alloys the most important is stellite, a cobalt-chromium-tungsten alloy that is used to face cutting tools. Tungsten carbide also is used to face cutting tools, it being the hardest artificial material in common use, having a hardness of 9.8 (Moh's scale) as compared with 10 for diamond. Small amounts of tungsten are used in chemicals to flameproof and waterproof fabrics, in dyes, and in other applications.

Production—In most years, imports of tungsten ore into the United States are greater than domestic production, and imports generally have exceeded production in a ratio of about two to one. The first tungsten mined in Washington was from the Germania mine in southern Stevens County in 1904, and some ore was produced in the state each year thereafter through 1918. After a period of inactivity, production began again in 1930 and has been almost continuous through 1955. Production in this state has never been large, and the maximum was 303 short tons of 60-percent WO_3 concentrate in 1938. Total production from 1900 through 1950 has been 1,326 short tons of 60 percent WO_3 concentrate, which is 1.01 percent of the United States total and causes Washington to rank seventh in output among the states. Many occurrences of tungsten minerals are known in 14 of the 39 counties in Washington, but most of the occurrences are in 3 northeastern counties, Okanogan, Ferry, and Stevens. A few properties have recorded production, but the most constant and largest output has been from the Germania mine and adjacent properties.

Prices—Tungsten ore prices are based on the short-ton unit of 20 pounds. The prices have fluctuated greatly in the past half century, rising from an annual average price of \$5.71 per unit in 1908 to \$33.98 by 1916, dropping to a

record low of \$2.25 by 1925, rising irregularly to \$13.13 by 1929, and dropping to \$9.20 by 1932. The average yearly price rose again to \$23.44 by 1940 and stayed near this level until April 1951, when the Federal Government set its purchase price at \$63 per unit. Tungsten metal sold at \$1.50 per pound in 1933; in 1948 metal of 98.8 percent purity was quoted at \$2.90 per pound, and 99.9 percent, at \$4.50. In March 1953 tungsten metals of the same purity were priced at \$5.85 and \$7.75, and the prices in June 1955 were \$4.39 and \$4.65, respectively.

Ore minerals—Tungsten does not occur uncombined in nature, and is found in relatively few minerals. Of the sixteen or so known tungsten-bearing minerals only four are of commercial importance, and three of these are members of a single isomorphous series. This series consists of the tungstates of iron and manganese, in which the manganese tungstate, huebnerite, $MnWO_4$, containing 76.6 percent WO_3 , is one end member and the iron tungstate, ferberite, $FeWO_4$, containing 76.3 percent WO_3 , is the other. Intermediate members are known as wolframite, $(Mn,Fe)WO_4$, and contain from 76.3 to 76.6 percent WO_3 . The other tungsten ore mineral is the calcium tungstate, scheelite, $CaWO_4$, containing 80.6 percent WO_3 . The brilliant blue-white fluorescence of scheelite under ultraviolet light is an aid in prospecting for this otherwise rather inconspicuous mineral. Buyers' tolerances of impurities in tungsten ores are variable, but penalties are generally charged for more than 1.6 percent tin, 0.2 percent arsenic, 0.1 percent copper, 0.05 percent phosphorus, 0.05 percent antimony, 0.4 percent bismuth, or 1.0 percent sulfur. Most ore mined in the United States contains 0.4 to 2.5 percent WO_3 .

Geology—Tungsten occurs in veins, replacements, segregations, and contact-metamorphic deposits within or near the margins of siliceous igneous rocks such as granites and pegmatites. It is commonly associated with tin or molybdenum, with pyrite and chalcopyrite, and less frequently with sphalerite and galena. Common associates in contact-metamorphic deposits are copper minerals, molybdenite, magnetite, garnet, epidote, and diopside. The tungsten minerals, because of their high specific gravity, tend to concentrate readily in placer deposits, generally close to their primary source.

OCCURRENCES

The map showing the numbered tungsten occurrences is plate 22, on page 57 in volume 2.

ASOTIN COUNTY

Joseph Creek (1)

Loc: On Joseph Cr. near its confluence with Grande Ronde R. **Owner:** H. B. Owsley, Pomeroy, Wash. (1939). **Ore:** Tungsten. **Ref:** 158.

CHELAN COUNTY

Blewett (4)

(see under tin)

Blewett Tungsten (3)

Loc: Sec. 1, (22-17E), Blewett dist. **Access:** About 0.2 mi. up Culver Gulch road from Blewett Pass highway. **Ore:**

Tungsten. **Ore min:** Scheelite. **Deposit:** Quartz vein 4 in. wide and exposed for 155 ft. contains scattered crystals of scheelite. **Dev:** 270-ft. adit with 90-ft. drift and some other old workings. **Ref:** 158.

Holden (1)

(see under copper)

Howe Sound

(see Holden under copper)

Irene

(see Holden under copper)

Red Mountain (2)

(see under copper)

Royal

(see Red Mountain under copper)

FERRY COUNTY

Addison (9)

(see under copper)

Apex

(see Big Chief under lead)

Big Chief (6)

(see under lead)

Chief

(see Big Chief under lead)

Faithful Surprise

(see Morning Star under gold)

Friedlander (10)

Loc: SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 31, (30-34E). **Access:** 5 mi. by road E. of Harlinda. **Ore:** Tungsten. **Ore min:** Wolframite, scheelite. **Deposit:** Sparsely mineralized quartz vein 12 in. wide in mica schist. **Dev:** Round pit 8 ft. deep and 15 ft. in dia. **Prod:** None known. **Ref:** 37, p. 25.

Gwin (5)

(see under silver)

Hall Creek

(see Gwin under silver)

Kelly Camp (3)

Loc: E $\frac{1}{2}$ sec. 4, (38-32E). **Elev:** 5,000 ft. **Access:** 18 mi. by road to railroad at Republic. **Owner:** Chas. J. Weller, Republic, Wash. (1954—). Federal Mining & Smelting Co. (1943). Ole Aavestrud and C. J. Weller, Coulee City, Wash. (1946-1954). **Ore:** Tungsten, copper, molybdenum. **Ore min:** Chalcopyrite, scheelite, magnetite, molybdenite. **Gangue:** Garnet, epidote, calcite. **Deposit:** Contact-metamorphic zone along W. side of a small roof pendant. Considerable amount of low-grade milling ore. **Dev:** 120-ft. westward-trending adit, several shafts, and numerous open cuts. **Improv:** 25-ton mill at Curlew Lk. (1952). **Prod:** 10 tons for mill test 1951. 1954, 1955. **Ref:** 37, p. 26. 133, p. 35. 158.

Laurier

(see Talisman under copper)

Lucile Dreyfus

(see Morning Star under gold)

Mineral Hill

(see Morning Star under gold)

Morning Star (1)

(see under gold)

Orion (7)

(see under silver)

Pacific Mutual

(see Addison under copper)

Silver Leaf (8)

(see under silver)

Surprise (4)

Loc: Near old Kettle Falls road 12 mi. E. of Republic, in face of cliff at top of talus slide. **Elev:** 100 or 150 ft. above bottom of a narrow canyon. **Access:** 12 mi. by road and $\frac{1}{2}$ mi. by trail from railroad at Republic. **Owner:** Jake Rounds and Mrs. Jones, Republic, Wash. (1942). **Ore:** Tungsten. **Ore min:** Scheelite. **Deposit:** Specks of scheelite scattered through tactite zone 8 ft. wide in limestone near quartz monzonite contact. **Dev:** Small open cut. **Assays:** Est. at less than 0.5% WO₃ in richest stringers. Does not appear promising. **Ref:** 158.

Talisman (2)

(see under copper)

Virginia

(see Morning Star under gold)

KING COUNTY

Devils Canyon (1)

(see under molybdenum)

Jack Pot (2)

(see under zinc)

KITSAP COUNTY

Chico (1)

(see under tin)

Cook-Kitchen

(see Chico under tin)

Kitchen

(see Chico under tin)

KITTTITAS COUNTY

Big Dome (1)

(see under copper)

LEWIS COUNTY

Eagle Peak (1)

(see under copper)

LINCOLN COUNTY

Crystal

(see under lead)

OKANOGAN COUNTY

Adams

(see Moncosilgo under copper)

Antimony Queen (5)

(see under antimony)

Auberton

(see Windiate-Auberton)

Bi-Metallic (33)

(see under molybdenum)

Border Lord (2)

Loc: On Apex Mtn., just S. of Wolframite (Hatfield) property. **Access:** 43 mi. N. of Winthrop by road and 13 mi. of trail. **Prop:** 7 unpatented claims. **Owner:** Border Lord Mining Corp., Seattle, Wash. (1952—). **Ore:** Tungsten. **Ore min:** Wolframite, scheelite, pyrite. **Gangue:** Quartz. **Deposit:** Vein as much as 10 in. thick. **Dev:** Open cuts. **Ref:** 37, p. 41. 158.

Boundary

(see Wolframite)

Buck Mountain (Buckhorn) (42)

Loc: On a ridge about $\frac{1}{2}$ mi. SW. of peak of Buck Mtn., in NE $\frac{1}{4}$ sec. 33, (34-24E). **Prop:** 1 claim. **Owner:** Kenneth Mosby, Brewster, Wash. (1954). **Ore:** Tungsten, molybdenum. **Ore min:** Scheelite, molybdenite, tetrahedrite, pyrite. **Deposit:** Biotite granite cut by quartz vein exposed for 500-ft. length and width of 2 in. to 3 ft., sparsely mineralized. **Dev:** 2 adits, shaft, trenches. **Prod:** 1 shipment of silver ore reported. **Ref:** 158.

Buckhorn
(see Buck Mountain)

Buckhorn
(see Magnetic under copper)

Bunker Hill
(see Silver King under lead)

Caaba
(see Kaaba under lead)

Campbell
(see Holden-Campbell under gold)

Chelan (15)
(see under gold)

Copper Queen (29)
(see under copper)

Copper World Extension (34)
(see under copper)

Corson (44)
(see under molybdenum)

Crystal Butte (32)
(see under iron)

Dixie Queen
(see Antimony Queen under antimony)

Doris Barbara (12)
(see also Holden-Campbell under gold)

Loc: NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 10, (30-22E), Squaw Cr. dist. **Prop:** Part of Holden-Campbell group. **Ore:** Tungsten, copper. **Ore min:** Scheelite, pyrite, and a little chalcopyrite. **Deposit:** A 2- to 5-ft. quartz vein carries rather large amounts of scheelite in places. **Dev:** 75-ft. adit. **Ref:** 158.

Dutch John (Sherwood, Lodge, Texas Creek) (6)

Loc: W $\frac{1}{2}$ SW $\frac{1}{4}$, E $\frac{1}{2}$ NW $\frac{1}{4}$, and W $\frac{1}{2}$ NE $\frac{1}{4}$ sec. 2, (31-22E), on top and NW. slope of Lookout Mtn. **Elev:** 3,400 ft. **Access:** 4 mi. by road up Texas Cr. from Carlton, thence 1 mi. S. to property. **Prop:** Three 80-acre blocks leased from State. **Owner:** H. E. Seneff, S. J. Sherwood, and W. L. Lodge (1943). **Ore:** Tungsten, copper, molybdenum. **Ore min:** Molybdenite, scheelite, magnetite, pyrite, chalcopyrite, hematite. **Gangue:** Garnet, epidote, calcite. **Deposit:** Contact-metamorphic replacement of calcareous beds. One 3- to 9-ft. garnet bed is exposed for 850 ft. Garnet rock av. 80% garnet. **Dev:** A 185-ft. adit, a 35-ft. adit (caved), a 12-ft. shaft, and numerous open cuts. **Improv:** Cabin. **Assays:** Not more than 0.25% scheelite. **Ref:** 37, pp. 51-52. 133-B, pp. 45-46. 158.

Ferris R. Ford
(see Wolframite)

Fluorspar
(see Tonasket under copper)

49th Parallel (23)
(see under copper)

Four Metals (21)
(see under lead)

Golden Chariot (24)
(see under copper)

Golden Eagle (16)
Loc: Near W. line SW $\frac{1}{4}$ sec. 13, (30-22E), on N. side of Squaw Cr. 200 ft. W. of Highland Light road. **Elev:** 1,900 ft. **Access:** $\frac{1}{2}$ mi. W. of Methow highway. **Prop:** Part of the Methow group (?). **Ore:** Tungsten. **Ore min:** Pyrite, scheelite. **Deposit:** A 2-ft. quartz vein which carries a small amount of pyrite and some scheelite. This is the same vein as that on the

Mineralite claim. **Dev:** Shaft more than 70 ft. deep. **Assays:** Less than $\frac{1}{4}$ % scheelite. **Ref:** 37, p. 50. 158.

Grant
(see Roosevelt under iron)

Grubscher
(see Gubser under lead)

Gubser (38)
(see under lead)

Hargrove
(see Silver King under lead)

Hatfield
(see Wolframite)

Highland (8)
(see under gold)

Highland Light
(see Highland under gold)

Holden-Campbell (13)
(see under gold)

Homestake (9)
(see also Methow under gold)

Loc: NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 12, (30-22E), Squaw Cr. area. **Prop:** Part of the Methow group. **Ore:** Tungsten. **Ore min:** Pyrite, scheelite. **Gangue:** Quartz. **Deposit:** 15-ft. vein exposed for 50 ft. Vein carries a large amount of pyrite and considerable scheelite. **Dev:** 50-ft. shaft from which 2 drifts have been driven. **Ref:** 158.

Homestake, long adit (7)
(see also Methow under gold)

Loc: Center W $\frac{1}{2}$ sec. 7, (30-23E), just above ranch buildings W. of the London mill, Squaw Cr. area. **Prop:** Part of the Methow group. **Ore:** Tungsten. **Ore min:** Scheelite. **Deposit:** Quartz vein 3 ft. wide carries considerable scheelite. **Dev:** 850-ft. adit and an open cut. **Ref:** 158.

Hunter (10)
(see under gold)

Iron Mask
(see Copper World Extension under copper)

Kaaba (22)
(see under lead)

Kaaba-Texas
(see Kaaba under lead)

Lady of the Lake (40)
(see under silver)

Lodge
(see Dutch John)

London
(see Methow under gold)

Lone Star (37)
(see under lead)

MacLean
(see Roosevelt under iron)

Magnetic (30)
(see under iron)

Methow (11)
(see under gold)

Milwaukee (7A)
Loc: N $\frac{1}{2}$ SE $\frac{1}{4}$ sec. 7, (30-23E), on E. side of Methow R. **Elev:** 100 ft. above river. **Ore:** Tungsten, copper. **Ore min:**

Pyrite, scheelite, secondary copper minerals. **Deposit:** Vein consisting of 12 in. of quartz on the hanging wall separated by a 1½-ft. basic dike from 3 in. of quartz on the footwall. **Dev:** 125-ft. adit. **Assays:** Not more than ¼% scheelite. **Ref:** 158.

Mineralite (17)

(see also Methow under gold)

Loc: NW¼SE¼ sec. 13, (30-22E), Squaw Cr. dist. **Access:** On W. side of the Methow road and about 200 ft. above it. **Prop:** Part of Methow group. **Ore:** Tungsten, copper. **Ore min:** Pyrite, chalcopyrite, scheelite. **Deposit:** A 2- to 4-ft. quartz vein traceable for several hundred ft. on the surface. **Dev:** Open cuts. **Assays:** Less than ¼% scheelite. **Ref:** 158.

Minnie (4)

(see under gold)

Moncosilgo (26)

(see under copper)

Monse (43)

Loc: 12 mi. NE. of Monse, on S. slope near base of a mountain. **Access:** Within ½ mi. of road. 11 mi. to railroad at Monse. **Prop:** 1 claim. **Owner:** Phil Bedard and Jack Barnes, Monse, Wash. (1943). **Ore:** Tungsten. **Ore min:** Scheelite. **Gangue:** Garnet. **Deposit:** Irregular tactite overlying granite. Outcrop covers about 30 by 70 ft. Best scheelite is in areas of coarsely crystalline garnet. **Assays:** 6 samples across widths of 4 to 6 ft. gave weighted av. of 0.59% WO. **Ref:** 157. 158.

Montgomery

(see Tonasket under copper)

Neutral

(see Magnetic under iron)

New Deal

(see Antimony Queen under antimony)

New London

(see Methow under gold)

O. K. (25)

(see under copper)

Okanogan (14)

(see under gold)

Paymaster (18)

(see under gold)

Pennington

(see Chelan under gold)

Rainbow (28)

Loc: Near SE. cor. sec. 14, (40-30E), 2,500 ft. W. of Magnetic mine workings. **Elev:** 5,000 ft. **Access:** Trail from Magnetic mine. **Ore:** Tungsten. **Ore min:** Scheelite, pyrite, pyrrhotite. **Gangue:** Garnet, epidote. **Deposit:** Quartzite and contact-metamorphosed limestone contain a few scattered crystals of the ore minerals. **Dev:** 460-ft. adit, several shafts. **Improv:** 2 old log cabins (1940). **Ref:** 158.

Reedy

(see Antimony Queen under antimony)

Roosevelt (19)

(see under gold)

Roosevelt (Grant) (31)

(see under iron)

Sheep Track (1)

Loc: On N. side of Wolframite Mtn. **Access:** Trail. **Prop:** 1 claim. **Owner:** Mrs. George Savage (1918). **Ore:** Tungsten. **Ore min:** Wolframite. **Gangue:** Quartz, muscovite. **Deposit:**

A 4-in. quartz vein in which are a few blades of wolframite. **Dev:** Open cut. **Ref:** 158.

Sherwood

(see Dutch John)

Silver King (39)

(see under lead)

Silver Seal

(see Antimony Queen under antimony)

Silver Tip

(see Starr under molybdenum)

Star

(see Lone Star under lead)

Starr (35)

(see under molybdenum)

Strawberry Lake (27)

(see under iron)

Teddy Roosevelt

(see Roosevelt under iron)

Texas Creek

(see Dutch John)

Tonasket (36)

(see under copper)

Twin Pine (45)

(see under zinc)

Washington (20)

(see under gold)

Windiate-Auberton (41)

Loc: SW¼SW¼ sec. 3, (34-29E), near Crawfish Lk. **Access:** ½ mi. private road and 4.2 mi. county road N. from Omak-Nespelem highway. **Owner:** S. R. Windiate and Steve Auberton, Omak, Wash. **Ore:** Tungsten, copper. **Ore min:** Scheelite, chalcopyrite. **Gangue:** Garnet, epidote, calcite. **Deposit:** Tactite zone in limestone bed 3 ft. thick in a metasediment series at its contact with quartz monzonite contains sparsely scattered scheelite and a high-grade streak about 3 in. wide which might contain about 2% scheelite. **Dev:** 40-ft. incline. **Assays:** Tungsten content probably is less than 0.5% in a zone 3 ft. wide, 20 ft. long, and unknown depth. **Ref:** 158.

Wolframite (Hatfield, Ferris R. Ford, Boundary) (3)

Loc: SE¼ sec. 7, S½ sec. 8, and SE¼ sec. 18, (40-22E), at head of Tungsten Cr. **Elev:** 6,500 to 7,400 ft. **Access:** 30 mi. by road and 13 mi. by trail from Winthrop via Chewack R. and its tributaries. **Prop:** 22 unpatented claims. **Owner:** Border Lord Mining Corp., Seattle, Wash., leasing from Dr. L. S. Dewey, Okanogan, Wash. (1952—). John Hatfield, Wenatchee, Wash. (1946). Originally located in 1908. **Ore:** Tungsten. **Ore min:** Wolframite, scheelite, pyrite, sphalerite, galenobismutite, tungstite. **Deposit:** Low-dipping quartz veins from 1 to 24 in., but most 5 to 10 in., wide in granite; some opened 250 to 300 ft. **Dev:** 9 adits, 11 open cuts. Total of about 1,700 ft. of drifts and crosscuts. **Improv:** 2 cabins, small jig mill, and a small steam plant (1950). **Assays:** Zone 2 to 4 ft. wide assayed 0.15% to 0.45% WO. **Prod:** 6 cars of handpicked ore shipped in 1920. 30 tons shipped in 1936, and 1 ton of conc. in 1942. **Ref:** 37, pp. 36-41. 97, 1911, p. 943; 1915, p. 826. 104, 11/30/34, p. 23; 2/29/36, p. 28. 105, vol. 94, 1907, p. 11; vol. 111, 1915, p. 870. 130, p. 90. 141, p. 109. 158.

PEND OREILLE COUNTY

Hardrock Thomas (4)

(see under copper)

Little Noisy (1)
(see under zinc)

Nevell (5)
(see under gold)

Scheelite Queen (3)

Loc: Sec. 3, (35-43E), Newport dist. **Access:** On highway. **Prop:** 1 unpatented claim. **Owner:** Jack Gallagher and associates, Newport, Wash. (1941). **Ore:** Tungsten. **Ore min:** Scheelite. **Deposit:** Fracture zone in granite is said to be mineralized with scheelite. **Dev:** Open cut. **Ref:** 29, p. 72.

Stagger Inn (2)

Loc: In road cut $1\frac{1}{2}$ mi. NW. of the Stagger Inn Forest Service Guard Station on the Nordman-Metaline Falls road. **Owner:** L. E. Hines, Spokane, Wash. (1943). **Ore:** Tungsten. **Ore min:** Scheelite. **Gangue:** Wollastonite or tremolite. **Deposit:** A narrow stringer of scheelite in boulders presumably derived from a road cut which exposes a limy layer in an argillaceous sedimentary series about 1,000 ft. from the closest granite outcrops. Only the barest trace of scheelite was found in the road cut itself. **Ref:** 158.

PIERCE COUNTY

Golden Rule (1)
(see under zinc)

SNOHOMISH COUNTY

Armament (13)
(see under copper)

Blackman
(see Doris under copper)

Brown
(see Doris under copper)

Calumet
(see Glacier Peak under copper)

Chatman
(see Jerry Chatman under copper)

Copper Belle
(see under copper)

Doris (8)
(see under copper)

Eldred (5)
(see under copper)

Florence Rae (7)
(see under copper)

"45" (3)
(see under silver)

Glacier Peak (1)
(see under copper)

Golden Eagle (11)
(see under molybdenum)

Hustler (6)
(see under copper)

Iowa (9)
(see under copper)

Jackson
(see St. Louis and Jackson under copper)

Jerry Chatman (10)
(see under copper)

Jones
(see Kromona under copper)

Kromona (12)
(see under copper)

Magus
(see "45" under silver)

Marvel (14)
(see under copper)

Mint
(see Iowa under copper)

St. Louis and Jackson (2)
(see under copper)

Scriber
(see Kromona under copper)

Silver Horseshoe (4)
(see under silver)

Wayside
(see Armament under copper)

SPOKANE COUNTY

Silver Hill (1)
(see under tin)

STEVENS COUNTY

Anderson
(see Becker-Anderson-Kirkwood)

Becker-Anderson-Kirkwood (25)

Loc: Adjoining Germania property on the N. and between $\frac{1}{2}$ and $\frac{3}{4}$ mi. N. of Germania mill, probably in sec. 13, (29-37E). **Prop:** 3 unpatented claims. **Owner:** Henry Becker, Fruitland, Wash., A. H. Henderson, Spokane, Wash., Fred Kirkwood, Fruitland, Wash. (1943). **Ore:** Tungsten. **Ore min:** Scheelite and possibly a little wolframite. **Deposit:** Vertical quartz vein 2 to 3 ft. wide cutting granite. **Dev:** 60-ft. adit on vein. **Assays:** One sample showed 0.68% WO₃. **Ref:** 158.

Big Iron (1)
(see under iron)

Black Horse
(see Columbia Tungsten)

Blue Grouse (new) (18)

Loc: SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 16, (30-42E), on Blue Grouse Mtn. **Elev:** 3,700 ft. **Access:** Road from Loon Lk. **Prop:** State land. **Owner:** W. H. West, Deer Park, Wash. (1955—). Pacific Mining Co., Seattle, Wash. (1951). Leased by Big Q Tungsten Mine, Inc., Seattle, Wash. (1953-1954). **Ore:** Tungsten. **Ore min:** Huebnerite. **Gangue:** Hydrothermally altered granite consisting mostly of quartz and muscovite. **Deposit:** Huebnerite crystals $\frac{1}{4}$ in. and less disseminated in hydrothermally altered granite near its contact with argillite. **Dev:** 2 adits, 3 shafts, 6 open cuts. **Prod:** 1939, 1940. **Ref:** 37, pp. 73-76. 158. 164, p. 222.

Blue Grouse (old) (19)

Loc: Near center W. line SW $\frac{1}{4}$ sec. 15, (30-42E), on Blue Grouse Mtn. **Elev:** 3,200 ft. **Access:** Road from Deer Park. **Prop:** State land. **Owner:** W. H. West, Deer Park, Wash. (1955—). Pacific Mining Co., Seattle, Wash. (1951). Leased by Big Q Tungsten Mine, Inc., Seattle, Wash. (1953-1954). **Ore:** Tungsten. **Ore min:** Huebnerite. **Gangue:** Quartz, muscovite, kaolin. **Deposit:** Hydrothermally altered granite along its contact with argillite and quartzite. **Dev:** Caved adit, vertical

shaft, several open cuts and pits. **Prod:** 1909. \$10,000 prior to World War I. **Ref:** 4, p. 214-216. 13, p. 156. 37, pp. 73-76. 97, 1910, p. 740. 104, 6/30/32, p. 28. 105, 1910, p. 489; 1912, pp. 178-179; 1915, p. 307. 106, 12/17/31. 114, no. 14, 1910, p. 39. 129, p. 51. 141, p. 108. 158. 164, p. 222.

Boundary Silver Lead

(see Lucile under zinc)

Columbia Tungsten (Black Horse, Stockwell) (13)

Loc: SW. cor. sec. 19, (32-38E). **Elev:** 3,450 to 3,520 ft. **Access:** ¼ mi. N. of the Addy-Bissell road. 10½ mi. from Cedonia. 18 mi. from railroad at Addy. **Prop:** 15 unpatented claims. **Owner:** Columbia Tungsten Corp., Spokane, Wash. (1938-1951). Leased by E. H. Jamieson, Spokane, Wash. (1951). **Ore:** Tungsten, molybdenum, zinc, silver, gold. **Ore min:** Wolframite, scheelite, molybdenite, pyrite, minor chalcocopyrite. **Gangue:** Quartz, tourmaline. **Deposit:** Short quartz veins 2 to 15 in. wide cutting porphyritic granite of a small stock near its contact with metamorphics. Tungsten mineralization is spotty and scarce. **Dev:** An old winding adit 196 ft. long, a lower adit 80 ft. long, and an upper adit 80 ft. long. 3 diamond drill holes totaling 200 ft. Surface trenches. **Assays:** 4 samples across widths of 0.8 ft. to 2.4 ft. showed tr. to 0.02 oz. Au, tr. to 2.82 oz. Ag, nil to 0.41% WO₃, 0.01% to 0.13% Mo. **Ref:** 30, p. 65. 37, pp. 67-69. 46, pp. 115-116. 130, pp. 90-91. 157. 158.

Daisy

(see Daisy-Tempest under silver)

Daisy-Tempest (12)

(see under silver)

Douglas

Loc: 18 mi. from Colville. **Access:** Road. **Prop:** 40 acres of deeded land. **Owner:** C. E. Douglas (1940). **Ore:** Tungsten, gold, silver, copper reported. **Deposit:** Said to be large. **Ref:** 158.

Easy Money

(see Magma under zinc)

Eldorado

(see Magma under zinc)

Gaber (17)

Loc: SE¼NE¼ sec. 18, (30-42E), on Frank Gaber farm. **Access:** Road. **Prop:** Deeded land. **Owner:** Frank Gaber (1941). **Ore:** Tungsten. **Ore min:** Wolframite, limonite pseudomorphs after pyrite. **Deposit:** A 12-in. quartz vein in granite. **Dev:** Trench 8 ft. deep, 5 ft. wide, and 60 ft. long. **Assays:** 1,200 lb. of ore milled at W. H. West's mill is said to have yielded 5 lb. of wolframite conc. **Ref:** 158.

Germania (26)

(see also Roselle)

Loc: Near center SW¼ sec. 13, (29-37E), Deer Trail dist. **Elev:** 3,550 ft. **Access:** Road from Springdale on the E. or from Reardan on the S. via Wellpinit. **Prop:** 640 acres of deeded land and 50 unpatented claims, among them the Blucher, Ziethen, Zieglitz, Roon, Moltke, Exodus, Exodus Fr., Roselle. **Owner:** Tungsten Uranium Mines, Inc., Spokane, Wash. (1955—). Roselle Mining Co. (1907-1920). Germania Mining Co. (1910-1920). American Tungsten Consolidated Corp. (1917-1920). Tungsten Producers, Inc. (1932-1936). General Electric Co. 1936-1941). Tungsten Mining & Milling Co. (1947-1953). Penticton Tungsten Mines, Ltd. (1953-1955). **Ore:** Tungsten. **Ore min:** Wolframite, pyrite, scheelite, galenobismutite, molybdenite, arsenopyrite, ferritungstite. **Gangue:** Quartz, chlorite, fluorite, tourmaline. **Deposit:** Quartz veins in granite, main vein from 2 in. to 3 ft. wide. Good ore has been removed. More molybdenum and less tungsten at lower levels. Area of

high radioactivity reported on property. **Dev:** 3 adits, 800 ft., 2,000 ft., and 1,250 ft. long. Also 2 short adits and numerous open cuts. 3,100 ft. of vein length stoped. **Improv:** Buildings and mill (1955). **Assays:** Tungsten minerals represented about 5.5% of vein filling. One assay of run of mine quartz showed 1 oz. Ag, 0.02 oz. Au. From 58,202 tons of ore produced 1936-1939 an av. of 0.4% WO₃ was recovered. 32,848 tons of tailings were reworked in 1939 and an av. of 0.13% WO₃ was recovered. **Prod:** 1,400 units 1904-1931. 57,436 units 1931-1940. 38 tons conc. 1936, 60 tons conc. 1937, 326 tons conc. 1938, 221 tons conc. 1939, 86 tons conc. 1940. 1941. 1951-1955. **Ref:** 7, pp. 118-123. 30, pp. 68-69. 37, pp. 77-78. 97, 1910, 1930, 1934-1941. 98, 1920-1925. 104, 7/15/35, p. 26; 10/30/36, p. 32. 105, vol. 90, 1905, p. 176; vol. 91, 1905, p. 234; no. 5, 1910, p. 307. 106, 5/21/31; 10/20/32. 113, 2/2/37, p. 6. 114, 12/10, p. 39. 130, pp. 89-90. 133, p. 40. 133-B, pp. 67-72. 141, p. 108. 158. 164, pp. 213-216.

Germania Consolidated (Keeth, Industrial Tungsten, Norton) (27)

(see also Green)

Loc: Secs. 23, 24, and 26, (29-37E), Deer Trail dist. **Elev:** 3,300 ft. **Access:** 20 mi. by road to Wellpinit and 63 mi. to Spokane. **Prop:** Consolidation of Industrial Tungsten and Keeth mines. 160 acres of deeded land, 320 acres leased from Colville Indian Reservation. **Owner:** Germania Consolidated Mines, Inc., Spokane, Wash. (1943—). **Ore:** Tungsten, molybdenum. **Ore min:** Ferberite, molybdenite, scheelite, pyrite, magnetite, chalcocopyrite, bismuthinite. **Deposit:** Wolframite occurs in 3 quartz veins rarely exceeding 8 in. thick in granite. One vein has been traced for 1,300 ft., the other for 1,080 ft. Radioactivity on 128 acres of deeded land near N. border of company holdings. **Dev:** Veins have been opened on 3 levels, comprising 930 ft. of crosscuts and 1,230 ft. of drifts (1943). 220-ft. shaft. More than 3,000 ft. of open cuts, stopes, shafts, and adits (1945). **Improv:** 25-ton mill, camp buildings (1955). **Assays:** A representative sample showed 0.39% WO₃, 0.19% Mo, 0.6 oz. Ag. **Prod:** \$100,000 in ferberite prior to 1945. Produced 1946, 1951-1955. Received \$34,704 for 561 units WO₃ in 19,921 lb. conc. 1951-1955. **Ref:** 30, p. 68. 37, pp. 78-79. 45-A. 108, 12/40, p. 39. 133, p. 33. 133-B, pp. 67-72. 158.

Green (Industrial Tungsten?) (28)

(see also Germania Consolidated)

Loc: NE¼SE¼NE¼ sec. 23, (29-37E), Deer Trail dist. **Prop:** Part of the Germania Consolidated Mining Co. holdings (1952). **Ore:** Tungsten. **Ore min:** Wolframite, scheelite. **Deposit:** Several 1-in quartz veins and one 6-in. quartz vein in granite. Veins contain scattered crystals of wolframite. **Dev:** 280-ft. adit. **Ref:** 158.

Harper

(see Pritchard and Harper under gold)

Harrison (20)

Loc: Near E. ¼ cor. sec. 16, (30-42E), on NE. side of Blue Grouse Mtn. **Ore:** Tungsten. **Gangue:** Quartz. **Deposit:** 24-in vein in pegmatitic granite near contact with metasediments. **Dev:** Inclined shaft. **Ref:** 158. 164, p. 221.

Heritage (4)

(see under zinc)

Industrial Tungsten

(see Green, Germania Consolidated)

Juno-Echo (16)

(see under copper)

Jupiter (21)

Loc: 1 mi. E. of Blue Grouse Mtn., Loon Lk. dist. **Ore:** Tungsten. **Ref:** 105, no. 15, 1910, p. 489.

Keeth

(see Germania Consolidated)

Kirkwood

(see Becker-Anderson-Kirkwood)

Lafayette**Loc:** Stevens County. **Ore:** Tungsten. **Ref:** 105, no. 24, 1915, p. 909.**Little Mountain (31)****Loc:** SE $\frac{1}{4}$ sec. 15, (28-41E), on Little Mtn., SW. of Deer Park. **Elev:** 2,650 ft. **Access:** 8 $\frac{1}{2}$ mi. from railroad at Deer Park. **Prop:** Deeded land. **Owner:** W. V. and Ernest Boggs and Alexander Best, Cusick, Wash., leasing from Fred M. Viles, Spokane, Wash. (1951). **Ore:** Tungsten. **Ore min:** Huebnerite, scheelite. **Deposit:** Quartz vein 4 to 8 in. wide exposed for 30-ft. length in granite. **Dev:** 3 shallow pits. **Prod:** 500 lb. of high grade. **Ref:** 157.**Longshot (10)**

(see under lead)

Loon Lake

(see Tungsten Products)

Lucile (2)

(see under zinc)

McMillan (11)**Loc:** NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 4, (34-39E), SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 33, and SW $\frac{1}{4}$ SW $\frac{1}{4}$ and NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 34, (35-39E). **Access:** 5 $\frac{1}{2}$ mi. by road to railroad at Colville. **Prop:** 160 acres deeded land. **Owner:** Don Skidmore owns surface rights. H. D. and D. E. McMillan, Colville, Wash., own mineral rights (1951). **Ore:** Tungsten. **Ore min:** Scheelite. **Deposit:** Scanty scheelite in widely scattered tactite bodies in dolomite near granite contact. Largest known tactite body is 10 by 40 ft. (1951). **Ref:** 157.**Magma (6)**

(see under zinc)

Mineral Ridge (7)**Loc:** SE $\frac{1}{4}$ sec. 31, (38-39E), Clugston Cr. area. **Access:** Road. **Prop:** 20 acres of deeded land. **Owner:** Messrs. Douglas and Peterson, Colville, Wash. (1941). **Ore:** Tungsten. **Ore min:** Wolframite. **Deposit:** Fracture zone in serpentine impregnated with quartz containing wolframite. **Assays:** Said to assay 0.61%. Not known whether this is W or WO $_3$. **Ref:** 30, p. 79.**Newland**

(see Longshot under lead)

Norton

(see Germania Consolidated)

Owen

(see Lucile under zinc)

Pioneer

(see Longshot under lead)

Pritchard and Harper (8)

(see under gold)

Read (9)

(see under iron)

Red Top (3)

(see under lead)

Roselle (29)

(see also Germania)

Loc: Sec. 24, (29-37E), Deer Trail dist. **Prop:** Located on SW. extension of original Germania location. Believed to have been acquired and added to the Germania group some time after 1905. **Ore:** Tungsten. **Prod:** 1904. **Ref:** 105, vol. 90, 1905, p. 176; vol. 91, 1905, p. 234. 164, pp. 213-216.**S. L. (22)****Loc:** E. of Tungsten King property in sec. 15, (30-42E), on Blue Grouse Mtn. **Ore:** Tungsten. **Deposit:** Quartzite cut by quartz vein containing huebnerite and cosalite. **Dev:** 190-ft. crosscut with 100 ft. of drifts and 30-ft. winze on vein. **Ref:** 164, p. 222.**Sand Creek (30)****Loc:** Sec. 3, (28-37E), on one of the branches of Sand Cr. **Elev:** 3,200 to 3,600 ft. **Access:** Road from Davenport. **Prop:** 200-acre Indian Agency lease. **Owner:** General Mining Co. (1939). **Ore:** Tungsten. **Ore min:** Wolframite, molybdenite. **Deposit:** Small stringers of quartz in altered granite near contact with argillite and schist contain scattered crystals of wolframite. **Dev:** 25-ft. adit, open pits and trenches. **Prod:** Several sacks of ore said to have been taken out in 1917. **Ref:** 30, p. 71. 97, 1934, p. 441. 130, p. 90. 141, p. 108. 164, p. 216.**Silver Mountain**

(see Daisy-Tempest under silver)

Stockwell

(see Columbia Tungsten)

Superior Copper (15)

(see under copper)

Tempest

(see Daisy-Tempest under silver)

Tile Creek (5)

(see under antimony)

Tungsten King (23)**Loc:** Center SE $\frac{1}{4}$ sec. 16, (30-42E), on Blue Grouse Mtn. **Elev:** 3,750 ft. **Access:** 5 or 6 mi. NE. of the town of Loon Lake by road. **Prop:** State land. **Owner:** W. H. West, Deer Park, Wash. (1955—). Deer Park Mining Co. (1910-1918). Tungsten Consolidated Mines (1910-1931). Tungsten King Mining Co. (1920). T. S. & L. Co. (1936). Blue Grouse Tungsten, Inc. (1940). Pacific Mining Co., Seattle, Wash. (1951). **Ore:** Tungsten. **Ore min:** Huebnerite, pyrite, molybdenite, cosalite (argentiferous). **Gangue:** Quartz, sericite, limonite, hematite. **Deposit:** Quartz veins parallel to the bedding in sandy schistose argillite. **Dev:** 2 adits and a shaft, caved (1940). **Assays:** A picked sample of cosalite ore assayed 27.20 oz. Ag, \$2.48 Au. **Prod:** Has produced. **Ref:** 4, pp. 215-216. 7, pp. 130-133. 30, p. 62. 37, pp. 73, 75-76. 55, p. 38. 97, 1910, p. 739. 98, 1922, p. 1666; 1925, p. 1833; 1926, p. 1595. 105, vol. 99, p. 19. 106, 12/17/31. 112, pp. 175, 203-204. 114, no. 4, 1910, p. 39. 130, p. 90. 141, pp. 108-109. 164, pp. 219-222.**Tungsten Products "west end" (Loon Lake) (24)****Loc:** Near center W $\frac{1}{2}$ sec. 16, (30-42E), on Blue Grouse Mtn. **Elev:** 3,300 ft. **Access:** Road from Loon Lk. **Prop:** 240-acre State lease. **Owner:** W. H. West, Deer Park, Wash. (1955—). O. M. Kimmel (1934). Tungsten Products, Inc. (1939). Pacific Mining Co., Seattle, Wash. (1951). **Ore:** Tungsten, tin. **Ore min:** Huebnerite, pyrite. **Gangue:** Greisen. **Deposit:** Hydrothermally altered granite and narrow quartz vein. **Dev:** 96-ft. adit, another short adit, and a shaft. **Assays:** 0.5% WO $_3$. Mill conc. said to show 0.2% Sn. **Prod:** 1934 (17 tons ore yielded 13 units WO $_3$), 1939 (100 tons ore), 1940. **Ref:** 30, pp. 61, 62. 37, p. 76. 158.**Washington Metals (14)****Loc:** S. center sec. 19, (32-38E), Summit dist. **Elev:** 4,200 ft. **Access:** $\frac{1}{2}$ mi. of road from Addy-Bissell road. 8 mi. from Cedonia. 18 mi. from railroad at Addy. **Prop:** 2 patented claims: View Nos. 1 and 2. **Owner:** Addy Development Co., Spokane, Wash. (1951—). G. L. Stockwell (1916-1917). W. J. McGowan

and Reed (1929-1930). Tungsten Mines, Inc. (1931-1943). Washington Metals Corp. (1936-1939). **Ore:** Tungsten, molybdenum. **Ore min:** Wolframite, scheelite, molybdenite. **Gangue:** Quartz, orthoclase, tourmaline. **Deposit:** Quartz veins from 2 to 12 in. wide cutting porphyritic granite. Veins pinch and swell in short distances. **Dev:** 768 ft. of drifts and crosscuts in 2 adits. **Assays:** 4 samples across widths of 4 to 12 in. showed 0.53% to 3.64% WO₃. **Prod:** Total 10 tons conc. 1916-1917, 1929-1932, 1936-1939. 1955. **Ref:** 2-A, p. 6. 37, pp. 69-70. 157.

Western Molybdenum

(see Juno-Echo under copper)

YAKIMA COUNTY

Bird (4)

(see also Copper Mining Co. under copper)

Loc: NW¼ sec. 18, (15-12E), Bumping Lk. dist. **Elev:** 5,200 to 5,350 ft. **Access:** Truck road from Copper City. 70 mi. by road from Yakima. **Prop:** Bird, Bird Extension, and Red Bird claims. **Owner:** Copper Mining Co., Yakima, Wash. (1906—). **Ore:** Tungsten, copper. **Ore min:** Chalcopyrite, scheelite, molybdenite, arsenopyrite, pyrite. **Gangue:** Quartz, calcite. **Deposit:** Series of parallel and diverging quartz veinlets along a hydrothermally altered shear zone in granitic rock. Shear zone varies from seam up to 7 or 8 ft. wide and can be traced on surface for over 2,000 ft. **Dev:** Lower Bird 450 ft., Middle Bird 80 ft., Upper Bird 160 ft., Red Bird caved, 9 open cuts, 2 shafts. **Assays:** Upper adit had av. of about 0.75% WO₃ for

av. width of 3.3 ft. and length of 40 ft. Lower adit shows av. of about 0.1% WO₃, 3.5 ft. wide for length of 150 ft. Better values at face of lower adit. **Prod:** 650 lb. of scheelite (63% WO₃) shipped in 1940 came mostly from Bird workings. **Ref:** 37, pp. 79-81. 41. 59. 130, pp. 84, 91. 141, p. 109.

Copper Mining Co. (5)

(see under copper)

Garibaldi (2)

(see also Copper Mining Co. under copper)

Loc: NE¼ sec. 13, (15-11E), Bumping Lk. dist. **Elev:** 5,700 ft. **Access:** 1,000 ft. N. of the end of the bulldozer road from Copper City. **Owner:** Copper Mining Co., Yakima, Wash. (1906—). **Ore:** Tungsten. **Ore min:** Scheelite (large crystals), arsenopyrite. **Deposit:** Quartz vein less than 6 in. wide in granitic rock. **Dev:** Open cut. **Ref:** 37, p. 83.

Gold Hill (1)

(see under gold)

Keystone (3)

(see under copper)

Lakeview

Loc: Bumping Lk. dist. **Prop:** Unpatented claims. **Owner:** Ball Mining Co. (1918). **Ore:** Tungsten, gold. **Dev:** 178-ft. adit, 2 large open cuts. **Assays:** As high as 50% W, \$1.25 to \$6.25 Au. **Ref:** 114, p. 167.

New Find (6)

(see under copper)

URANIUM

Properties—Uranium is a metal that is hard but ductile and malleable. It is very heavy (2½ times as heavy as steel) and is capable of taking a high polish. The polished metal, however, rather quickly oxidizes to a black surface. In powder form uranium is black and pyrophoric, catching on fire spontaneously upon exposure to air. In its chemical behavior it is most closely related to chromium. Other properties are given in the table on page 12. Uranium is radioactive, and the isotope U₂₃₅ (present in natural uranium to the extent of about 0.7 percent), is fissionable—properties of utmost importance. Uranium radiates alpha rays, and in its atomic disintegration produces a series of elements including helium, radium, actinium, and lead, which emit alpha, beta, and gamma rays. Pound for pound, fissionable uranium has more than two and a half million times the heat-producing energy of coal.

Uses—By far the most important use of uranium is as a source of nuclear energy, which is utilized in the atomic bombs, and which is being developed for use in power plants for various military and industrial applications. Nonenergy uses of uranium in recent years have been largely in the chemical industries, including use as catalysts and in analytical reagents. Next in importance has been its use in ceramics—in glass for a coloring agent and to regulate the coefficient of thermal expansion of the glass. It has been used in motion picture film manufacture, in electrical equipment, and luminous paint, and it has been alloyed with steel for special uses.

Production—During the years 1945 through 1950 the United States consumption of uranium for nonenergy purposes varied between 1½ and 2½ tons per year. The

amount used in the atomic energy program has not been announced. Prior to World War II most of our uranium was imported, but domestic sources now produce large quantities. Data on production and imports and exports are not disclosed. Every producer of uranium ore must be licensed by the U. S. Atomic Energy Commission, and the ore must be sold either directly to the Commission or to a buyer licensed by it.

Prices—Uranium salts prices have not changed greatly in the past few years. Sodium uranate sold at \$1.25 per pound in 1936, \$1.75 in 1939, and \$1.65 from 1942 to 1948. Uranium metal prices have risen considerably, however, being quoted at \$7.00 per pound in 1943, \$20.00 in 1946, and \$50.00 per pound for high-purity metal in 1950. The Atomic Energy Commission's domestic uranium program provides for: (1) A guaranteed minimum price, effective through March 31, 1962, of \$3.50 per pound f.o.b. shipping point, for uranium oxide (U₃O₈) contained in domestic ores or mechanical concentrates assaying at least 10 percent U₃O₈. This price does not apply to the carnotite-type and roscoelite-type ores of the Colorado Plateau. (2) Guaranteed minimum prices, effective through March 31, 1962, for the carnotite-type and roscoelite-type ores of the Colorado Plateau area, varying from \$1.50 per pound of U₃O₈ in ores containing 0.10 percent U₃O₈ to \$3.50 per pound of U₃O₈ in ores containing 0.20 percent or more U₃O₈. (3) A bonus of \$10,000, effective until April 11, 1958, for the discovery of a new deposit and the production therefrom of the first 20 short tons of uranium ore or mechanical concentrate assaying 20 percent or more U₃O₈. (4) The Commission will pay an additional graduated bonus of up to \$35,000, depending upon the quantity and

grade of ore, for initial production and delivery of acceptable uranium ore from new and certain existing mining properties. For new properties this bonus payment will be made on each pound of uranium oxide up to and including the first 10,000 pounds.

Ore minerals—More than 100 uranium-bearing minerals are known. In some of these uranium is the principal constituent, but in others it is only a minor part of the mineral. The more important primary minerals are the oxides, pitchblende (50 to 80 percent U_3O_8) and uraninite (65 to 90 percent U_3O_8). Some of the more common secondary uranium minerals are the potassium uranium vanadate, carnotite (50 to 55 percent U_3O_8); the calcium uranium phosphate, autunite (60 percent U_3O_8); the copper uranium phosphate, torbernite (60 percent U_3O_8); the calcium uranium vanadate, tyuyamunite, (48 to 55 percent U_3O_8); and the calcium uranium silicate, uranophane (65 percent U_3O_8). In general, uranium occurs combined as oxides, phosphates, sulfates, arsenates, carbonates, vanadates, silicates, and hydrocarbons. Uranium minerals that have been found in Washington include uraninite, pitchblende, brannerite, autunite, torbernite, uranophane, nonazite, and allanite. The latter two minerals are primarily thorium bearing but sometimes contain uranium. Other uranium minerals reported in Washington are eunerite, fergusonite, samarskite, euxenite, and cyrtolite.

Geology—Uranium ore deposits occur in a great variety of rocks of igneous, metamorphic, and sedimentary origin. Primary deposits in hydrothermal veins appear to favor felsic intrusive rocks and arenaceous metasediments as host rocks. Within the veins, associated minerals contain, in decreasing order of abundance, iron, copper, cobalt, lead, silver, nickel, and bismuth. Of these, perhaps cobalt, nickel, and bismuth are most indicative. Pegmatites commonly contain uranium minerals but almost never in commercial quantities. The potassium-rich pegmatites, or zones in them, have been indicated as most favorable for the occurrence of uranium minerals. The secondary uranium-mineral occurrences, as low-grade disseminations in the sedimentary rocks—sandstone, shale, and limestone, are currently producing large tonnages of ore in the United States. A very large part of the domestic production comes from sedimentary-type deposits of this kind, largely from the Colorado Plateau in the "four corners" region of Colorado, Utah, Arizona, and New Mexico.

Because serious prospecting for uranium in Washington started only very recently and new discoveries of radioactivity are being reported each week, it is impossible to include all the uranium occurrences in the following list. Any such list would be incomplete a short time after compilation.

The map showing the numbered uranium occurrences is plate 23, on page 59 in volume 2.

CHELAN COUNTY

Holden (1)

(see under copper)

Although fairly large areas in Washington are underlain by Mesozoic and Tertiary continental sedimentary rocks, and some of these areas are being prospected, no sedimentary-type deposits in which carnotite commonly occurs have yet been found here. All the verified occurrences of uranium in Washington are either in granitic rock or in metamorphic rocks intruded by granite. Uraninite and secondary uranium minerals have been found in pegmatite dikes in this state but not in commercial quantities. The more promising uranium deposits in Washington have been found (1) in and near the contact of granite and rock the granite intrudes, (2) in shear zones cutting these rock types, and (3) as secondary minerals impregnating the fractured, decomposed, and disintegrated granitic and metamorphic rocks adjacent to contacts and shear zones. In other words, primary uranium mineralization may be expected to occur under much the same conditions as does copper, gold, silver, lead, zinc, molybdenum, and other ore mineralization.

Recent developments—Uranium prospecting and exploration in Washington expanded very rapidly during the first few months of 1955, especially in Stevens and Spokane Counties. This activity was the direct result of the discovery of substantial quantities of uranium ore at the Midnite Mines property on the Spokane Indian Reservation in southern Stevens County. Many large and small mining companies and thousands of individuals staked claims on open Federal land or obtained mineral leases on State and private lands north of the Reservation throughout Stevens County. Similar exploration activity in the vicinity of Mount Spokane was triggered by the announcement of the discovery of good-grade autunite mineralization on the Dahl farm near Elk in northern Spokane County. Exploration has been active in the whole northern row of counties westward from the Idaho boundary to the western flanks of the Cascade Mountains and in the Cascades about as far south as Mount Rainier. Locations showing radioactivity are known or have been reported in at least 10 counties in this general region, and this area includes all the authenticated uranium occurrences in Washington; however, because of the tremendous interest in uranium prospecting, there probably is no county in the state in which some prospecting has not been done. To date (April 1956) only two uranium properties in Washington have shipped ore—the mine originally operated by Midnite Mines, Inc., and the Day-break Uranium, Inc. mine on the Dahl farm.

OCCURRENCES

Howe Sound

(see Holden under copper)

Irene

(see Holden under copper)

Keefer Brothers (2)

(see under molybdenum)

Peshastin

Loc: 12 mi. from Peshastin. **Owner:** R. F. Brown (1897).

Ore: Uranium, but the occurrence has not been authenticated.

Ore min: "Probably a silicate." **Deposit:** 5-ft. ledge. **Ref:** 105, 10/16/97, p. 359.

Safety Harbor Creek (4)

Loc: Safety Harbor Cr. area. **Access:** Trail. **Prop:** 6 claims. **Owner:** Western States Uranium, Inc. (1955—). **Ore:** Uranium. **Ref:** 158.

Winesap Canyon (3)

Loc: SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 5, (26-21E), near head of Winesap Canyon (Oklahoma Gulch). **Access:** 5 mi. by road to railroad. **Prop:** 1 unpatented claim. **Owner:** George Goman, Winesap, Wash. (1942). **Ore:** Uranium. **Ore min:** Uraninite. **Deposit:** Pegmatite made up of feldspar, quartz, and muscovite, with very minor amount of uraninite. **Dev:** Open cut 4 ft. by 6 ft. **Ref:** 67, p. 53. 158.

FERRY COUNTY

Box Canyon (5)

Loc: Sec. 28, (37-37E), Nancy Cr. area. **Owner:** V. L. Stevens, Colville, Wash. (1955). **Ore:** Uranium. **Deposit:** Autunite in pegmatitic gneiss. **Ref:** 158.

Hurrell (8)

Loc: Sec. 21, (36-37E), on SE. flank of Bisbee Mtn., W. of Kettle Falls. **Owner:** John Hurrell, Inchelium, Wash. (1955). **Ore:** Uranium (?). **Deposit:** Radioactivity in pegmatite. **Ref:** 158.

Lucky Leslie (1)

Loc: Near center W $\frac{1}{2}$ NW $\frac{1}{4}$ sec. 23, (38-34E), on N. side of Mt. Leona. **Elev:** 5,950 ft. **Access:** 1 $\frac{1}{2}$ mi. by trail to N. Fk. St. Peters Cr. road, by which it is 7 $\frac{1}{2}$ mi. to railroad at Malo. **Prop:** Lucky Leslie No. 2 and several other unpatented claims. **Owner:** Wm. Alexander and Chas. Bilderback, Sweet Home, Oreg. (1955). **Ore:** Uranium. **Deposit:** Uraninite and uranophane in irregular pegmatite lens 25 ft. long and up to 5 ft. thick along a shear zone that is parallel to schistosity in biotite schist and quartzite. **Dev:** Shallow open cut. **Assays:** Radiometric tests on samples from open cut show 0.35% to 1.40% U₂O₅ equivalent. **Ref:** 158.

Lucky 21 (2)

Loc: Near center NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 15, (38-34E), E. of Malo, on St. Peters Cr. **Elev:** 3,750 ft. **Access:** 7 mi. by road to railroad at Malo. **Prop:** 10 unpatented claims, including Lucky 21. **Owner:** Bert Edwards, Doug Elmes, Malo, Wash., and William B. Kleinhans, Republic, Wash. (1955). **Ore:** Uranium. **Deposit:** Uraninite and uranophane in narrow pegmatitic lenses in quartzite and schist. **Dev:** Open cuts. **Assays:** 0.325% U₂O₅ reported. **Note:** Since the original 8 claims were staked, 30 or more claims were staked nearby in a few days by various people. **Ref:** 158.

Nancy Creek (6)

Loc: SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 29, (37-37E), near Nancy Cr. **Access:** 2 $\frac{1}{2}$ mi. by road to railroad. **Prop:** 8 claims and 120 acres deeded land. **Owner:** Patrick Sullivan and Darrell Newland, Colville, Wash., hold lease and have subleased to Day Mines, Inc., Wallace, Idaho (1955—). **Ore:** Uranium. **Deposit:** Uraninite and uranophane in pegmatitic lenses in gneiss. **Assays:** 0.31% to 1.45% U₂O₅ reported. **Note:** Since the original discovery in this area dozens of claims were staked within a short time. **Ref:** 158.

Oregonian (3)

Loc: W $\frac{1}{2}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 14 and E $\frac{1}{2}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 15, (38-34E), S. of St. Peters Cr. **Access:** $\frac{1}{2}$ mi. by trail to N. Fk. St. Peters Cr. road, by which it is 7 $\frac{1}{2}$ mi. to railroad at Malo. **Prop:** Oregonian and several other unpatented claims. **Owner:** Art Cooper, Sweet Home, Oreg., and Ben Butler, Republic,

Wash. (1955). **Ore:** Uranium. **Deposit:** Sparse uranophane in 50-ft. by 50-ft. outcrop of pegmatitic granite in biotite schist. **Ref:** 158.

Section 36 (7)

Loc: Sec. 36, (37-36E), near head of Nancy Cr. **Access:** About 8 mi. by road to railroad. **Owner:** Leases on 320 acres of State land held by R. C. Mulligan, R. J. Pulley, M. F. Fowler, and T. Jones, Okanogan, Wash. (1955). **Ore:** Uranium. **Deposit:** Pegmatitic granite in gneiss contains uranophane, autunite, and a little heavy black uranium mineral that probably is uraninite; also hyalite, garnet, and apatite. **Assays:** Samples reported to run as high as 0.51% U₂O₅. **Ref:** 158.

Sherman Creek Pass (4)

Loc: Vicinity of Sherman Cr. Pass, Columbia Mtn., and Sherman Pk., 17 mi. E. of Republic. **Elev:** 4,000 to 7,000 ft. **Access:** About 16 mi. by road to railroad at Republic. **Prop:** 29 or more claims. **Owner:** Sherman Creek Uranium Mines, Inc., Burl Fowler, A. J. Lane, R. R. Embody, Republic, Wash. (1954—). **Ore:** Uranium. **Ore min:** Monazite, autunite. **Deposit:** Weak radioactivity is sporadically distributed over large area near contact of granite with gneiss and schist, and local areas show considerable radioactivity. At least part of the radioactivity is concentrated in biotite-rich pegmatitic segregations, and here the radioactivity is due to the presence of monazite. Small amount of autunite has been reported along joints in talus blocks. **Dev:** Open cuts, diamond drill holes. **Assays:** "Surface samples indicated up to 0.14% U₂O₅." **Note:** Since the original discovery hundreds of claims have been staked in this area. **Ref:** 158.

Sunset Mines (9)

Loc: About 4 mi. W. of Kettle Falls. **Prop:** 7 claims. **Owner:** Sunset Mines, Inc. (1955—). **Ore:** Uranium. **Deposit:** Finely divided uranium mineral (uraninite ?) in biotite gneiss. **Assays:** Some samples ran as high as 0.4% U₂O₅. **Ref:** 158.

GRANT COUNTY

Grand Coulee (1)

Loc: 5 mi. S. of Electric City on road to Coulee City. **Ore:** Uranium. **Deposit:** Polycrase in pegmatite. **Ref:** 158.

Peterson

Loc: Grand Coulee Dam area, possibly in Grant County. **Owner:** Ben I. Peterson, Moses Lake, Wash. (1954—). **Ore:** Uranium. **Ore min:** Uraninite, brannerite, Allanite, euxenite, and cyrtolite reported. **Deposit:** Radioactive minerals in pegmatitic granite. **Assays:** 0.06% U₂O₅ by radiometric analysis. **Ref:** 158.

KING COUNTY

Rainy (1)

(see under gold)

Snoqualmie

(see under thorium)

Western States Copper

(see Rainy under gold)

KITITAS COUNTY

Big Dome (1)

(see under copper)

LEWIS COUNTY

Eagle Peak (1)

(see under copper)

LINCOLN COUNTY

Egypt

(see Pitney Butte under molybdenum)

Germania Consolidated

Loc: 17 mi. N. of Davenport. **Prop:** 1,600 acres leased by Germania Consolidated Mines, Inc., Spokane, Wash. (1955—). **Ore:** Uranium (?). **Deposit:** "Uranium indications" found. **Dev:** Drill holes. **Ref:** 158.

Pitney Butte (1)

(see under molybdenum)

Spokane Molybdenum

(see Pitney Butte under molybdenum)

OKANOGAN COUNTY

Aeneas (3)

Loc: NW¼ sec. 15, (36-29E), on S. side of Aeneas Valley. **Access:** 19 mi. by road to railroad at Tonasket. **Prop:** Deeded land. **Owner:** Ted Eberle, Tonasket, Wash. (1955). **Ore:** Uranium. **Deposit:** Slight radioactivity along pegmatitic bands in gneiss. **Assays:** One sample showed 0.18% U₂O₅. **Ref:** 158.

American Strategic Minerals (5)

Loc: Sec. 9, (40-26E), on N. slope of Elemeham Mtn., S. of Similkameen R. **Prop:** Unpatented claims. **Owner:** American Strategic Minerals Corp., Tonasket, Wash. (1955). **Ore:** Uranium (?). **Deposit:** Radioactive black magnetic mineral in metamorphic rock. **Ref:** 158.

Bi-Metallic (2)

(see under molybdenum)

Happy Hill (4)

Loc: 4 mi. NW. of Okanogan, on Happy Hill. Probably in SE¼ sec. 14, (34-25E). **Prop:** 15 claims and some leased land. **Owner:** Sherman Creek Uranium Mines, Inc., Republic, Wash. (1955—). **Ore:** Uranium, thorium, cerium. **Ore min:** Monazite. **Dev:** Bulldozer trenches. **Assays:** As high as 5% monazite, with 2½% to 3% rare earths content and 0.06% to 0.08% U₂O₅. **Ref:** 158.

Lost Lake (1)

Loc: Near Lost Lake, along the international boundary at Molson. **Owner:** Barney Quinn (1925). **Ore:** Uranium, gold, and silver reported. **Assays:** Reported to show \$84 per ton in uranium, \$6 in silver, and \$4 in gold. **Ref:** 106, 5/16/25, p. 25.

Sanpoil (6)

Loc: Sec. 25, (35-31E), on upper part of Sanpoil R. **Prop:** Unpatented claims. **Owner:** Albert Allen (1956). **Ore:** Uranium. **Deposit:** Pegmatite containing scattered tiny grains of samarskite and radioactive violet-colored fluorite. **Assays:** Specimens reported to show max. of 0.3% U₂O₅. **Ref:** 158.

PEND OREILLE COUNTY

Bella May (new adit) (3)

(see under zinc)

Clark

(see Josephine under zinc)

Dry Canyon (6)

(see under thorium)

Golden Anchor (7A)

Loc: 9 mi. W. of Usk. **Prop:** 6 unpatented claims. **Owner:** Golden Anchor Mining and Milling Co., Spokane, Wash., leasing from George L. and Lloyd Howard, Spokane, Wash. (1955—). **Ore:** Uranium. **Deposit:** Autunite in pegmatite. **Dev:** Shallow pits. **Ref:** 158.

Grandview mine (2)

(see under zinc)

Highnoon Uranium (8)

(see also Rocky Ridge and West)

Loc: Lost Creek area. **Prop:** 10 claims and leases on 1,500 acres of land. **Owner:** Highnoon Uranium Mines, Inc., % J. R. Jones, Newport, Wash. (1955—). **Ore:** Uranium. **Deposit:** Small deposit of high-grade ore. **Ref:** 158.

Josephine (1)

(see under zinc)

Kimball Mines (9)

Loc: 7 mi. W. of Newport, 2 mi. W. of Diamond Lk., on Bert Smith farm. **Prop:** Mineral rights lease on 282 acres of deeded land. **Owner:** Kimball Mines, Inc., Spokane, Wash., leasing from Bert Smith, Newport, Wash. (1955—). **Ore:** Uranium (?). **Deposit:** Higher-than-normal radioactivity in old prospect hole in decomposed granite. **Ref:** 158.

Metaline Mining and Leasing Co. (4)

(see under zinc)

Pend Oreille Mines & Metals Co.

(see Josephine under zinc)

Ponsness (10)

Loc: Secs. 18 and 19 (?), (35-46E), near Idaho boundary, N. of Newport. **Owner:** Lloyd Ponsness, Newport, Wash. (1955). **Ore:** Uranium. **Deposit:** Autunite in weathered granite. **Ref:** 158.

Rocky Ridge (6A)

Loc: On Ruby Cr., W. of Blue Slide. **Prop:** Unpatented claims. **Owner:** Highnoon Uranium Mines, Inc., Newport, Wash. (1955—). **Ore:** Uranium. **Deposit:** Commercial-grade ore reported. **Ref:** 158.

Ruby (7)

Loc: Sec. 6, (34-44E), near Ruby. **Owner:** Lewis E. DeChenne, Cusick, Wash. (1955). **Ore:** Uranium. **Ore min:** Uraninite, autunite. **Deposit:** Pegmatite containing smoky quartz, albite, muscovite mica, a little apatite, and a few tiny garnet crystals; also has a few scattered grains of uraninite altered in part to autunite. **Ref:** 158.

Sacheen Lake (5)

Loc: Probably sec. 30 (or possibly sec. 29 or 32), (31-44E), on top of hill just E. of Sacheen Lk. **Owner:** Forrest Corwin, E. 1624 Liberty Ave., Spokane, Wash. (1939). **Ore:** Uranium (?). **Deposit:** A sample of pegmatitic granite composed of quartz, orthoclase, and a very little magnetite showed slight radioactivity in one very restricted area of the specimen. **Ref:** 158.

South Skookum Lake

Loc: About ½ mi. E. of South Skookum Lk., probably in sec. 6, (33-45E). **Prop:** 21 claims. **Owner:** Silver Dollar Mining Co., Spokane, Wash. (1955). **Ore:** Uranium. **Deposit:** Autunite in shear zone in granite. **Dev:** Bulldozer cuts. **Assays:** Channel sample across 3-ft. width showed 0.74% U₂O₅. **Ref:** 158.

Stagger Inn (11)

Loc: Near Stagger Inn Ranger Station. **Prop:** 6 unpatented claims. **Owner:** Northwest Prospecting and Development Co., Spokane, Wash. (1955). **Ore:** Uranium (?). **Deposit:** Radioactivity along granite-argillite contact. **Ref:** 158.

Starlight Uranium (8A)

Loc: Sec. 10, (32-42E), near Calispell Cr. **Prop:** 8 unpatented claims. **Owner:** Starlight Uranium Co., Frank Gibson, Deer Park, Wash. (1955). **Ore:** Uranium. **Deposit:** Autunite disseminated in rotten granite across a width of 30 ft. **Ref:** 158.

West (5A)

Loc: Near Diamond Lk. **Owner:** Highnoon Uranium Mines, Inc., Newport, Wash. (1955—). **Ore:** Uranium. **Deposit:** Commercial-grade ore reported. **Ref:** 158.

PIERCE COUNTY

Rushing River (1)

Loc: On Rushing R. (or Rushingwater Cr. ?) on W. flank of Mt. Rainier. **Prop:** 38 unpatented claims. **Owner:** Al Nigro, Frank Stankevich, and J. L. Pennington, Tacoma, Wash. (1955). **Ore:** Uranium. **Ore min:** Pitchblende. **Assays:** Samples reported to run as high as 19.8% U₃O₈. **Ref:** 158.

SKAMANIA COUNTY

Rainbow (1)

(see under vanadium)

SNOHOMISH COUNTY

Broken R'dge (5A)

(see under copper)

Keller (5)

Loc: Near Mineral City, probably in sec. 6, (28-11E). **Access:** 1 mi. by trail and about 15 mi. by road from railroad at Index. **Prop:** 8 unpatented claims. **Owner:** M. E. Keller, McKenna, Wash., and Harold Mykol, Olympia, Wash. (1955). **Ore:** Uranium. **Deposit:** Uraninite in quartz veinlets. Also some sandstone that is radioactive. **Assays:** Specimens run as high as 10% U₃O₈. **Ref:** 158.

Kromona (4)

(see under copper)

Mackinaw (1)

(see under copper)

Molly (2)

Loc: Sec. 30, (28-11E), near Galena Lookout Station. Approx. 9 mi. E. of Index on N. Fk. of Skykomish R. **Owner:** Wm. C. Duncan, Seattle, Wash. (1951). **Ore:** Uranium, molybdenum. **Ore min:** Molybdenite, uraninite, chalcopyrite. **Ref:** 157.

Silver Creek

(see Broken Ridge under copper)

Sultan (3)

Loc: 5 mi. W. of the town of Sultan. **Owner:** A. A. Kennedy. **Ore:** Uranium. **Ref:** 1, 10/16, p. 110. 14, p. 50.

Weden Creek

(see Mackinaw under copper)

SPOKANE COUNTY

Affiliated Mines (20)

Loc: On W. slope of Mt. Kit Carson. **Prop:** 620 acres of leased land. **Owner:** Affiliated Mines, Inc., Spokane, Wash. (1955—). **Ore:** Uranium. **Ore min:** Autunite. **Dev:** Diamond drill holes, bulldozer trenches. **Ref:** 158.

Anaconda Uranium (21)

Loc: Lee lease: S½SE¼ sec. 23, (28-44E). Stanley lease: NW¼ sec. 6, (27-45E). **Elev:** 2,450 to 3,056 ft. **Access:** Roads. **Prop:** 240 acres of leased land. **Owner:** Anaconda Uranium Corp., Spokane, Wash. (1955—). **Ore:** Uranium. **Deposit:** Autunite and gummite reported in granite. **Ref:** 158.

Carbon (16)

Loc: Sec. 7, (28-44E), Mt. Spokane area. **Owner:** Carbon Mining & Uranium Co., Spokane, Wash. (1955—). **Ore:** Uranium. **Ref:** 158.

Columbia Enterprises (7)

Loc: S½SE¼ sec. 1, (28-44E), Mt. Spokane area. **Access:** 8 mi. by road to railroad at Elk. **Prop:** Several unpatented claims. **Owner:** Mt. Spokane Minerals & Uranium, Inc., Spokane, Wash., leasing to Columbia Enterprises Inc., Longview, Wash. (1955). Ownership of mineral rights on this property is currently (1955) in controversy. **Ore:** Uranium. **Deposit:** Coarse crystals of autunite along joints and irregular seams in altered pegmatitic granite. Radioactivity and float traceable for several hundred ft. **Dev:** Open pits. **Assays:** Picked sample ran 6.8% U₃O₈. **Ref:** 158.

Curtin (18)

Loc: W½NW¼ sec. 24, (28-44E), Mt. Spokane area. **Owner:** Oliver and Lillian Curtin leasing to Dawn Uranium & Oil Co., Spokane, Wash. (1955—). **Ore:** Uranium. **Deposit:** Autunite in granite. **Dev:** 4 out of 20 wagon-drill holes indicated commercial ore at depths of from 15 to 50 ft. **Ref:** 158.

Dahl (Daybreak) (1)

Loc: E½NE¼ sec. 11, (28-44E), about 18 mi. NE. of Spokane, in Mt. Spokane area. **Elev:** 2,800 ft. **Access:** 8 mi. by road to railroad at Elk and about 30 mi. to railroad at Spokane. **Prop:** 80 acres of deeded land. **Owner:** Alfred L. Dahl, Elk, Wash., leasing to Daybreak Uranium, Inc., Spokane, Wash. (1955—). **Ore:** Uranium. **Deposit:** Meta-autunite occurs as veinlets and fillings of closely spaced joints in decomposed granite. 5 ore bodies in an area 250 ft. by 900 ft., being worked by open pit. **Dev:** 7 diamond drill holes (July 1955) show ore to depth of at least 100 ft. 46,300 tons proven ore reserves reported. **Assays:** Channel samples across 35-ft. width showed 0.35% to 0.80% U₃O₈. First 10 carloads shipped av. 0.55% U₃O₈. **Prod:** Production began Aug. 1955. Total of 5,196 tons through Sept. 1956 av. 0.3346% U₃O₈. Also 7 carloads from nearby Huffman lease in Sept. 1956.

Dahl Uranium Mine, Inc. (5)

(see also under Stevens County)

Loc: SE¼ sec. 1, (28-44E) and N½SW¼ and SW¼SW¼ sec. 6, (28-45E), 1¼ mi. NE. of original discovery on Dahl (Daybreak) uranium property, in western foothills of Mt. Spokane. **Access:** Road. **Prop:** Mineral rights on 141 acres of deeded land. **Owner:** Dahl Uranium Mine, Inc. leasing from Leonard A. and Betty C. Dahl, Spokane, Wash. (1955—). **Ore:** Uranium. **Deposit:** High-grade autunite ore reported exposed in 2 places more than 100 ft. apart. One drill hole showed ore mineralization from 22 ft. to 35 ft. deep, and a second hole about 340 ft. S. of the first showed ore at 35-ft. depth. A vein 21 in. wide, exposed for 17 ft., carries up to 2% U₃O₈. **Prod:** A few carloads reported in 1956. **Ref:** 158.

Dawn Uranium & Oil (8)

(see also Curtin, Smith)

Loc: E½W½ sec. 8, (28-44E) and secs. 26 and 27, (29-44E), near Elk, about 2 mi. N. of Dahl property, Mt. Spokane area. **Access:** Road. **Prop:** More than 160 acres of leased land. **Owner:** Dawn Uranium & Oil Co., Spokane, Wash., leasing from R. E. Wisemore, Spokane, Wash., and H. B. Sams, Elk, Wash., and others (1955). **Ore:** Uranium. **Deposit:** Showings of autunite reported in shallow test pits in decomposed granite. At a depth of more than 300 ft. a diamond drill hole intersected 5 ft. of steeply dipping mineralized zone containing autunite. Autunite in 2 other widely spaced holes. **Dev:** Diamond drill holes in S½SE¼ sec. 27, (29-44E). **Ref:** 158.

Daybreak

(see Dahl and see Bair, Lowley under Stevens County)

Elk Uranium (2)

Loc: 1 mi. E. of Dahl property, and other places in Spokane and Stevens Counties. **Prop:** Mineral rights on several thousand

acres of deeded land. **Owner:** Elk Uranium, Inc., Spokane, Wash. (1955—). **Ore:** Uranium. **Deposit:** Radioactivity reported. **Dev:** Bulldozer trenches and diamond drill holes. **Ref:** 158.

Fish Lake (14)

Loc: E $\frac{1}{2}$ SE $\frac{1}{4}$ sec. 32 and W $\frac{1}{2}$ SW $\frac{1}{4}$ sec. 33, (24-42E), just N. of Fish Lk. **Access:** Paved highway crosses deposit, and railroad is within a few hundred ft. **Prop:** Deeded land. **Ore:** Uranium. **Ore min:** Secondary minerals. **Deposit:** Small irregular masses and veinlets of pegmatite near contact of granite with older metamorphic rocks. Although slight radioactivity may be detected in many places over an area of several thousand sq. ft., no concentrations of ore grade are known. **Ref:** 158.

Graham (15)

Loc: Sec. 11, (29-44E), Mt. Spokane area. **Prop:** 160-acre lease. **Owner:** Sidney Mining Co. and Mascot Mines, Kellogg, Idaho (1955—). **Ore:** Uranium. **Deposit:** Autunite found in 3 shallow pits. **Ref:** 158.

Kit Carson Uranium (3)

Loc: Center SE $\frac{1}{4}$ sec. 13, (28-44E) and sec. 18, (28-45E), S. of Dahl property. **Elev:** 3,350 ft. **Access:** Road. **Prop:** Leases on 600 acres of deeded land. **Owner:** Kit Carson Uranium, Inc., Spokane, Wash., leasing from R. B. Pulliam, Colbert, Wash. (1955—). **Ore:** Uranium. **Deposit:** Coarse autunite crystals are abundant in a 6-in. low-dipping shear zone in rotten pegmatitic granite. Ore zone 400 ft. long and 50 ft. wide reported. Two other ore bodies indicated. Ore mineralization found at depths of a few ft. to 156 ft. in about half of 52 holes drilled to depths of 50 to 156 ft. Ore from 42 to 90 ft. in one hole. **Dev:** Four 50-ft. bulldozer trenches. **Ref:** 158.

Miner (6)

Loc: NE $\frac{1}{4}$ sec. 30, (29-45E), 3 mi. NE. of Dahl property, in Mt. Spokane area. **Access:** About 8 mi. by road to railroad at Elk. **Prop:** 350 acres of deeded land. **Owner:** Dr. W. C. Miner, Opportunity, Wash. (1955). **Ore:** Uranium. **Deposit:** Radioactive ore reported to be in a zone 2 to 3 ft. wide exposed in road cut. **Dev:** Bulldozer cuts. **Ref:** 158.

Morning Sun Uranium (4)

Loc: Adjacent to the Dahl property on the E., in W $\frac{1}{2}$ NW $\frac{1}{4}$ and W $\frac{1}{2}$ NE $\frac{1}{4}$ and N $\frac{1}{2}$ SE $\frac{1}{4}$ sec. 1, (28-44E) and NW $\frac{1}{4}$ sec. 7, (28-45E), Mt. Spokane area. **Access:** 8 mi. by road to railroad at Elk. **Prop:** 240 acres of State land, in sec. 12, 160 acres $\frac{1}{2}$ mi. to the E., and 80 acres $\frac{1}{4}$ mi. to the NE. **Owner:** Daybreak Uranium, Inc., Spokane, Wash., has lease from A. L. Dahl, who is leasing from State (1955—). **Ore:** Uranium. **Ore min:** Meta-autunite. **Gangue:** Granite. **Deposit:** Ore mineralization reported to be similar to that at Dahl deposit. **Dev:** Bulldozer trenches. **Ref:** 158.

Painted Desert (12)

(see also under Stevens County)

Loc: 2 mi. S. of Dahl property. **Prop:** Mineral leases on about 1,000 acres. **Owner:** Leased by Painted Desert Uranium and Oil Co., Spokane, Wash. (1955—). **Ore:** Uranium. **Deposit:** High-grade autunite in float reported. Some uranium in one hole at depth of 20 to 40 ft. **Dev:** Diamond drill holes. **Ref:** 158.

Schaefer (13)

Loc: Secs. 19, 30, and 31, (29-44E) and secs. 24, 25, and 36, (29-43E), near Milan. **Access:** Railroad crosses property. **Prop:** Mineral lease on several hundred acres of deeded land. **Owner:** Daybreak Uranium, Inc., Spokane, Wash., leasing from Everett and Irene Schaefer (1955). **Ore:** Uranium. **Deposit:** Good autunite crystals found at a depth of 7 ft. **Ref:** 158.

Section 32 (9)

Loc: Sec. 32, (28-45E), near top of Mt. Spokane. **Ore:** Uranium. **Deposit:** Autunite in granite. **Ref:** 158.

Section 21 (10)

Loc: Sec. 21, (28-45E), near top of Mt. Spokane. **Ore:** Uranium. **Deposit:** Autunite in granite. **Ref:** 158.

Smith (17)

Loc: E $\frac{1}{2}$ SW $\frac{1}{4}$ sec. 13, (28-44E), Mt. Spokane area. **Owner:** Emma L. and Clarence I. Smith leasing to Target Uranium Co., which has made a 50-50 profit-sharing agreement with Dawn Uranium & Oil Co., Spokane, Wash. (1955—). **Ore:** Uranium. **Deposit:** Commercial ore found in 6 out of 10 wagon-drill holes. 6,650 tons of ore reported to a depth of 60 ft. **Prod:** At least 1 carload in 1956. **Ref:** 158.

Stapleton (12A)

Loc: E $\frac{1}{2}$ sec. 1, (29-44E), Mt. Spokane area. **Elev:** 2,800 to 3,100 ft. **Prop:** 320 acres of leased land. **Owner:** National Uranium Corp., Wallace, Idaho, has 10-yr. lease (1955—). **Ore:** Uranium. **Deposit:** Autunite in shear zone in pegmatitic granite. **Dev:** Adit, 6 open cuts. **Ref:** 158.

Thompson (19)

Loc: Sec. 18, (28-45E), on W. slope of Mt. Kit Carson. **Prop:** 200-acre lease. **Owner:** Leased by Tungsten Uranium Mines, Inc., Spokane, Wash. (1955—). Have profit-sharing agreement with Rayrock Uranium Co. **Ore:** Uranium (?). **Deposit:** Radioactive spring. **Ref:** 158.

Tungsten Uranium Mines (11)

(see also Germania under tungsten, Stevens County)

Loc: Sec. 18, (28-45E), 1 mi. W. of Mt. Spokane State Park and 4 mi. S. of Dahl property. **Prop:** Mineral leases on 323 acres of deeded land. **Owner:** Leased by Tungsten Uranium Mines, Inc., Spokane, Wash., from Arthur Selleck (1955). **Ore:** Uranium. **Deposit:** Autunite reported in granite. **Dev:** Bulldozer trenches. **Ref:** 158.

STEVENS COUNTY

A A (1)

Loc: Sec. 26, (40-36E), Orient dist. **Prop:** 1 unpatented claim: A A No. 2. **Owner:** Berger Benson, Spokane, Wash. (1955). **Ore:** Uranium. **Deposit:** Autunite in pegmatitic gneiss. **Ref:** 158.

Arden (4)

Loc: SE $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 14, (34-39E), about 1 mi. SE. of Arden. **Elev:** 1,875 ft. **Owner:** L. E. Haye, Lakeview, Wash. (1955—). **Ore:** Uranium. **Deposit:** Autunite sparsely distributed along a NE.-trending fractured zone for a length of 5 ft. in Loon Lake granite. Zone of fracturing and clay-mineral alteration is about 2 ft. wide. Considerable fluorescent hyalite in the vicinity. **Ref:** 158.

Bair (14)

Loc: E $\frac{1}{2}$ sec. 14, (27-37E), near Spokane R., on Spokane Indian Reservation. **Owner:** Daybreak Uranium, Inc., Spokane, Wash., has assignment of prospecting lease held by Mr. Bair from Spokane Indian Tribe (1955—). **Ore:** Uranium. **Ore min:** Autunite, uraninite. **Assays:** Sample from veinlets across a 30-ft. bulldozer cut showed 0.48% U₂O₅ by chemical analysis. **Ref:** 158.

Big Smoke Uranium (18)

Loc: Sec. 11, (27-37E), near Spokane R. **Prop:** The company holds prospecting permits on more than 10,000 acres of Spokane Indian Reservation land. **Owner:** Big Smoke Uranium, Inc., Spokane, Wash. (1955—). **Ore:** Uranium. **Ore min:** Uraninite, gummite. **Deposit:** 2 veins in 30-ft. fault zone in arkose near

contact with granite. Uraninite and gummite in coal in seam 8 ft. wide at depth of 14 ft. A second vein is 12 in. wide and is 30 ft. N. of the first. **Dev:** Bulldozer pit 12 ft. deep. **Assays:** Chemical assay of soil from 3-ft. depth showed 0.28% U_3O_8 . A 2-ft. vein showed 0.50% U_3O_8 equivalent, but chemical assay showed 1.30% U_3O_8 . **Prod:** A few carloads shipped in 1956. **Ref:** 158.

Boyd (11)

Loc: Adjoining Midnite mine on E. **Prop:** 458 acres of Spokane Indian Reservation land allotted to Ed Boyd and other members of the Boyd family. **Owner:** Leased by Dawn Mining Co., Portland, Oreg. (1956). **Ore:** Uranium. **Deposit:** Similar to adjacent Midnite deposit. **Assays:** 50 ft. of ore in drill hole av. 0.30% U_3O_8 . **Ref:** 158.

Calispell Peak

(see Cannon)

Cannon (Calispell Peak, Railway Dike) (5)

Loc: Near W. $\frac{1}{4}$ cor. sec. 33, (34-42E), on headwaters of Chewelah Cr. **Elev:** 3,750 to 4,340 ft. **Access:** About $\frac{1}{2}$ mi. by trail from the end of the road up Chewelah Cr. **Prop:** 1 claim. **Owner:** Merikay Mines, Laurence Hammond, New York, N. Y., leasing from Northern Pacific Ry. (1952). Earl and Perry Cannon, Chewelah, Wash. (1950). **Ore:** Uranium, columbium, tantalum, beryllium. **Ore min:** Columbite, uraninite, autunite, torbernite, beryl, a few specimens of bismutite. **Gangue:** Quartz, feldspar, muscovite. **Deposit:** Pegmatite dike in roof pendant of schist near intrusive granite. Pegmatite zone is 50 ft. wide and has a length of 1,050 ft. Only a few crystals of uraninite and columbite found. **Dev:** 2 open cuts, 8 trenches, 353-ft. adit. **Assays:** Uranium and columbium content below commercial grade. **Prod:** 6 tons of beryl in 1952. **Ref:** 158.

Crawford

(see Indian Chief Uranium)

Dahl Uranium Mine, Inc. (12)

(see also under Spokane County)

Loc: Sec. 13, (28-37E), near Midnite mine. **Owner:** Dahl Uranium Mine, Inc., Spokane, Wash. (1955—). **Ore:** Uranium. **Deposit:** Autunite near contact of granite with argillite. **Dev:** Several drill holes as much as 75 ft. deep showed weak radioactivity. One hole showed ore from the 128-ft. to 140-ft. depth. **Assays:** 0.20% to 0.70% U_3O_8 equivalent from 128-ft. to 134-ft. depth in one hole. **Ref:** 158.

Germania (8)

(see under tungsten)

Germania Consolidated (8A)

(see under tungsten)

Indian Chief Uranium (Crawford) (7)

Loc: Sec. 10, (29-37E) and N $\frac{1}{2}$ sec. 8, (29-38E), about 7 mi. N. of Midnite mine. **Access:** Roads. **Prop:** 22 unpatented claims. **Owner:** Indian Chief Uranium Co. leasing to Sidney Mining Co. and Mascot Mines Co., Kellogg, Idaho (1955—). **Ore:** Uranium. **Deposit:** Autunite reported in sec. 10, (29-37E) in a "tight" vein at a granite-quartzite contact. Exposed along the full length of a 30-ft. bulldozer trench that does not reach either end of the vein. **Dev:** 1,800 ft. of bulldozer trenching (May 1955). **Ref:** 158.

Lowley (17)

Loc: S $\frac{1}{2}$ sec. 13, (27-37E), 7 mi. S. of Midnite mine. **Prop:** 320 acres. **Owner:** Daybreak Uranium, Inc., Spokane, Wash., has assignment of prospecting lease held by William Lowley, Wellpinit, Wash. (1955—). **Ore:** Uranium. **Ore min:** Uraninite, uranophane, autunite, and torbernite. **Deposit:** Faulted contact between granite and metasediments has uranium mineralization in small fracture seams throughout an area 100 ft. by 300 ft.

Assays: 50 lb. of samples across 70-ft. width reported to run 1.05% U_3O_8 . **Prod:** 5 carloads reported in 1956. **Ref:** 158.

Lucky Charm Uranium (10)

Loc: Adjoins the Midnite uranium mine on the NE. In sec. 7, (28-38E), also secs. 23 and 26, (27-37E) and S $\frac{1}{2}$ sec. 23, (29-38E). **Owner:** Lucky Charm Uranium Mines, Inc., Spokane, Wash., holds prospecting permits on 5 sections of Spokane Indian Reservation land. **Ore:** Uranium. **Deposit:** "Good radioactivity." Autunite along joints in altered basalt in bulldozer cuts in S $\frac{1}{2}$ sec. 23, (29-38E). **Ref:** 158.

Midnite (9)

Loc: Secs. 1 and 12, (28-37E), on flanks of Lookout Mtn., 10 mi. NW. of Wellpinit. **Elev:** 2,800 to 3,400 ft. **Access:** 33 mi. by road to railroad at Springdale or Reardan. **Prop:** 570-acre lease from Spokane Indian Agency. **Owner:** Midnite Mines, Inc., Clair Wynecoop, Pres., Wellpinit, Wash. (1954—) leasing to Dawn Mining Co., 503 Public Service Bldg., Portland, Oreg. (1955—). **Ore:** Uranium. **Ore min:** Autunite, uranophane, gummite, torbernite, uraninite, liebigite, phosphuranylite. **Gangue:** Altered rock. **Deposit:** Radioactivity traced more than 1 mi. N. and S. Uranium mineralization is in shear zones at and near intrusive contact of Loon Lake granite and Deer Trail argillite in a contact zone which is 100 to 200 ft. wide. Ore bodies, ranging up to several hundred ft. in length and 30 or more ft. in width, are richest at the center and grade outward to assay walls. Autunite and uranophane are the principal ore minerals, but uraninite was found with pyrite at a depth of 150 ft. in one core hole. Mineralization is strongest along joints in argillite but extends down into granite also. Est. 700,000 tons ore reserves reported in 1956. **Dev:** 13 diamond drill holes drilled by A.E.C. and 28,476 ft. of diamond drill holes drilled by Dawn Mining Co. Numerous bulldozer trenches, 540 ft. of adit workings (1955). **Assays:** One representative sample ran 0.48% U_3O_8 , and others ran as high as 0.86% U_3O_8 . Av. of 709 tons shipped was 0.285% U_3O_8 . **Prod:** 100 tons of ore in 1954, 609 tons through Feb. 1955. 94 carloads of ore prior to end of Jan. 1956. **Ref:** 152-A. 158.

Northwest Uranium (15)

Loc: On Spokane Indian Reservation, southern Stevens County, 3 mi. S. of Midnite mine. **Owner:** Northwest Uranium Mines, Inc., Wallace, Idaho (1955—). **Ore:** Uranium. **Ore min:** Autunite. **Deposit:** Secondary uranium minerals in faults and lignite beds in flat-lying Tertiary claystone, sandstone, and conglomerate beds overlying granite. **Dev:** Trenches in an area 1,000 ft. by 600 ft. **Assays:** Sample across 20-ft. stratigraphic thickness of beds shows 0.13% U_3O_8 . Selected samples from lignite show as high as 1.15% U_3O_8 and av. 0.643%. A fault-breccia zone 3 ft. wide assays 0.237% U_3O_8 . Chemical analysis of three 50-lb. samples showed: (1) bentonitic clay and carbonaceous material—0.427% U_3O_8 , (2) arkose—7.16% U_3O_8 , (3) conglomerate—0.128% U_3O_8 . Radiometric analysis of these same samples showed only about half the above indicated values. **Ref:** 158.

O'Toole Mountain (3)

Loc: N $\frac{1}{2}$ sec. 9, (38-39E), on O'Toole Mtn., 12 mi. from Bossburg. **Elev:** 3,500 ft. **Access:** Road. **Prop:** 2 claims: Mountain View No. 1, Urabar No. 1. **Owner:** V. J. Granfors, Seattle, Wash. (1953). Grutts and Mulligan (1903). **Ore:** Uranium reported, but one spectrographic analysis failed to show any uranium although the sample was radioactive. The rare earth elements, scandium, yttrium, and ytterbium are present. **Ore min:** Pyrite, galena. **Ref:** 105, 2/03, p. 95.

Painted Desert (2A)

(see also under Spokane County)

Loc: Near Orient. **Prop:** 6 claims and options on 195 acres of land. **Owner:** Painted Desert Uranium and Oil Co., Spokane,

Wash. (1955—). **Ore:** Uranium. **Assays:** Samples reported from 0.30% to 1% U₃O₈. **Ref:** 158.

Railway Dike

(see Cannon)

Section 13 (16)

Loc: Sec. 13, (27-37E), in Spokane Indian Reservation. **Ore:** Uranium. **Deposit:** Uranophane in anthophyllite along contact. **Ref:** 158.

Snowshoe (6)

Loc: Secs. 33 and 34, (30-38E). **Prop:** 10 unpatented claims. **Owner:** American Silver Mining Co., Spokane, Wash., and Frontier Uranium, Inc., Seattle, Wash., jointly own the property (1955). **Ore:** Uranium (?). **Deposit:** Radioactivity reported. **Ref:** 158.

Square Deal (13)

Loc: Sec. 13, (28-37E), adjacent to Midnite property. **Owner:** Square Deal Mining & Milling Co., Wallace, Idaho, has agreement with Spokane Indian tribal members who hold prospecting permits on 640 acres (1955). **Ore:** Uranium. **Deposit:** U₃O₈, values of about 0.1% along granite-argillite contact. **Ref:** 158.

U & W Uranium (2)

Loc: Leased land in Secs. 13, 14, 23, 24, 25, and 26, (40-36E), Orient dist. **Access:** Road. **Prop:** Several hundred acres of

leased land, 11 unpatented adjacent claims. **Owner:** U & W Uranium, Inc., Spokane, Wash., is leasing mineral rights from J. C. B. Graeber and others (1955). **Ore:** Uranium. **Deposit:** Uraninite in mica schist. **Assays:** One sample from center SE $\frac{1}{4}$ sec. 23, (40-36E) is reported to show 2.82% U₃O₈. **Ref:** 158.

YAKIMA COUNTY

Bumping Lake (1)

Loc: In the valley of Deep Cr., near the mouth of Copper Cr., on the road to Copper City, 5 mi. S. of Bumping Lk. dam. **Access:** 5 mi. by gravel road and 11 mi. by paved road from Chinook Pass highway. 53 mi. by road from railroad at Naches. **Prop:** 6 unpatented claims, including El Khohbar No. 1. **Owner:** Tom Hendrix, Yakima, Wash. (1954—). **Ore:** Uranium. **Deposit:** Strong radioactivity in soil and gravel around a mineral spring which emerges from granite near contact with andesite. Also some autunite along joints in granite. **Dev:** Open pits. **Assays:** 0.88% U₃O₈ by wet analysis and 0.36% U₃O₈ by radiometric test on surficial soil. **Note:** Within a few days of the announcement of this original discovery more than 80 claims were staked by various people in an area about 2 $\frac{1}{2}$ mi. square in this vicinity. **Ref:** 158.

Chinook Pass (2)

Loc: About 3 mi. E. of Chinook Pass, in western Yakima County. **Owner:** Thomas Smith, Hainline, Wash. (1955—). **Ore:** Uranium reported. **Ref:** 158.

VANADIUM

Properties—Vanadium is a brilliant silver-white metal that is soft, corrosion resistant, and malleable and ductile enough to be drawn into wire. It is not affected by air or water at ordinary temperatures. Chemically it may be either acid or base forming. Its valences are 2, 3, 4, and 5, the last being the most stable. Other properties are shown in the table on page 12.

Uses—In 1950 about 90 percent of the vanadium consumption was as ferrovanadium, which was used in the manufacture of tool steels, other special steels, and in wear-resisting cast irons. Small amounts of ferrovanadium were used in welding-rod coatings, in magnets, and as a deoxidizer. In the same year ductile vanadium, 99.8 percent pure, was made available, but no commercial use has yet been made of the unalloyed metal, except as targets in X-ray apparatus. A few nonferrous alloys have been developed, the most important of which are of vanadium with copper and with aluminum. Both of these alloys are strong and corrosion resistant. Very small additions (0.1 to 0.2 percent) of vanadium to steel bring about great increases in strength, elastic limit, hardness, and shock resistance. Vanadium chemicals have some uses as catalysts in making sulfuric acid and various organic compounds, and other vanadium compounds are used in glass, ceramic glazes, as driers in paints and inks, and in laboratory research.

Production—United States production of vanadium in ores and concentrates dropped from over 5 $\frac{1}{2}$ million pounds in 1943 to a little more than 2 million pounds in 1947, and since that date production figures have been restricted for security reasons. The few principal United States consumers of vanadium have their own sources of ore, and it would be difficult for an outsider to bring

a new deposit into profitable operation. Vanadium minerals have been reported in seven counties in Washington, but only the occurrences in Skamania County have been verified, and none of these has had any production.

Prices—The quoted price for V₂O₅ contained in vanadium ores remained at 27 $\frac{1}{2}$ cents per pound f.o.b. mines for a period of 26 years, from early 1925 to early 1951; thereafter the quotation was raised to 31 cents per pound, where it remained at least through most of 1955. Although the price of contained vanadium in ferrovanadium alloy has fluctuated somewhat, it also has had a remarkably small long-range variation, selling at \$3.15 to \$3.50 in 1930 and \$3.00 to \$3.20 in 1953.

Ore minerals—Vanadium is widely spread in minute quantities, occurring in most rocks in amounts varying between a trace and a few hundredths of 1 percent. Some petroleum and many coals contain very small percentages of the element, and the oxide may be recovered from the ashes of these organic materials. Vanadium occurs in more than 60 minerals, but only 5 of these are primary. The minerals of principal economic interest are the sulfide, patronite, VS₄, containing 19.5 percent vanadium; the vanadium mica, roscoelite, H_xK(Mg,Fe)(Al,V)₄(SiO₃)₁₂, containing from 20 to 29 percent V₂O₅; and the vanadates, vanadinite, 3Pb₃V₂O₈·PbCl₂, containing 19.4 percent V₂O₅, descloizite, 4(Pb,Zn)O·V₂O₅·H₂O, and carnotite, K₂O·2UO₃·V₂O₅·3H₂O, containing about 20 percent V₂O₅.

Geology—Vanadium has been recovered commercially from phosphate rock, iron ore, chrome ore, magnetite beach sands, bauxite, petroleum and coal ashes, and asphaltite. In addition, many lead, zinc, and copper deposits contain a little vanadium, and, especially in dry regions

where the soluble salts are not carried away immediately in solution, it concentrates in the oxidized parts of the veins as vanadinite, descloizite, and related minerals. The world's largest known reserves are in the form of patronite in asphaltite in Peru, but in the United States the largest reserves are in small irregular deposits in soft

fine-grained sandstone, between the grains of which are roscoelite, carnotite, and similar vanadium minerals. These deposits are in an extensive area in western and south-western Colorado and portions of the adjoining states. The only authenticated vanadium occurrences in Washington are in the oxidized zone of copper deposits.

OCCURRENCES

The map showing the numbered vanadium occurrences is plate 23, on page 59 in volume 2.

CHELAN COUNTY

Dryden

Loc: 12 to 15 mi. from Dryden. **Ore:** Vanadium. **Deposit:** This unverified report is of doubtful authenticity. **Ref:** 40, p. 37.

CLARK COUNTY

Sunset Falls (1)

Loc: Vicinity of Sunset Falls C. C. C. Camp in SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 24, (4-4E). **Access:** Road. **Ore:** Reportedly vanadium. Very doubtful. **Deposit:** Country rock of andesite, agglomerate, and flow breccia. **Ref:** 158.

KITTITAS COUNTY

Big Z

(see Zerwekh under gold)

Zerwekh (1)

(see under gold)

SKAGIT COUNTY

Scott (1)

Loc: 9 mi. N. of Hamilton. **Prop:** 5 claims. **Owner:** Scott Bros. (1936). **Ore:** Vanadium. Doubtful occurrence. **Ref:** 158.

SKAMANIA COUNTY

Last Chance (2)

(see under copper)

Rainbow (3)

Loc: Center S $\frac{1}{2}$ S $\frac{1}{2}$ sec. 32, (3-5E), on ridge separating the W. Fk. of Washougal R. from Wild Boy Cr. **Access:** 14 mi. by road from Cape Horn. **Owner:** Owned by Fred Wark and optioned by John Hogg, Vancouver, Wash. (1942). **Ore:** Re-

portedly vanadium, lead, copper, gold, silver, uranium. Presence of uranium is very doubtful. **Gangue:** Quartz, some amethystine. **Deposit:** Quartz vein with yellow phosphate mineral along cracks. **Dev:** 2 shafts. **Assays:** As much as 5% vanadium reported. **Ref:** 58, p. 56. 104, vol. 14, no. 4, p. 40. 158.

Skamania (1)

(see under copper)

SNOHOMISH COUNTY

Clara Thompson

(see Jasperson under gold)

Commonwealth

(see Jasperson under gold)

Good Hope (2)

(see under gold)

Index

Loc: Index dist. **Owner:** C. S. Armstrong. **Ore:** Vanadium. **Assays:** 98% "vanadium" reported. Doubtful. **Ref:** 14, p. 19. 40, p. 37.

Jasperson (3)

(see under gold)

McCombs

(see Jasperson under gold)

Wayside (1)

(see under copper)

Webster

(see Jasperson under gold)

WHATCOM COUNTY

Smith (1)

Loc: Sec. 23, (40-4E). **Prop:** 80 acres. **Owner:** Lowell F. Smith, Sumas, Wash. (1936). **Ore:** Vanadium reported. Doubtful. **Ref:** 158.

ZINC

Properties—Zinc is a bluish-white lustrous metal that is easily fusible and fairly hard. It is brittle at ordinary temperatures, but when annealed it becomes ductile and malleable and does not become brittle upon cooling, but when reheated to 200° it is again brittle. It is a fair conductor of heat and electricity. Zinc is only moderately resistant to corrosion, but it is better than iron in this respect, and because of this and the very great affinity that zinc and iron have for each other, it is used to coat and protect iron from atmospheric corrosion. The electrochemical properties of zinc account for its use in batteries, and its chemical properties for its use in photoengraver's sheets. Zinc is bivalent in all its compounds. Other properties are shown in the table on page 12.

Uses—The galvanizing industry has long been the largest consumer of zinc, accounting for more than 45 percent of the 1950 consumption. Galvanizing is the placing of a thin coating of zinc, usually on iron or steel sheet, wire, tubes, pipe, fittings, and other shapes. Zinc-base alloys for die castings used nearly 30 percent of the available zinc in 1950, followed by brass (14 percent) for sheet, strip, plate, rod, wire, tubes, castings, and other copper-base products. Rolled zinc accounted for about 7 percent of the consumption; zinc oxide, 2 percent; and 1 percent, for other uses such as wet batteries, desilvering of lead, in light-metal alloys, and chemicals. Zinc oxide and other chemicals are used as pigments, as a filler in rubber, in glass manufacture, in medicines, and in many other minor uses.

Production—Zinc is mined in ten western states, seven central states, and four eastern states, but is smelted or refined in only four states. In the west there are custom zinc smelters in Idaho at Kellogg, in Montana at Anaconda and Butte, and in British Columbia at Trail. Zinc output in the Tri-State district has dropped from 55 percent of the total United States production in 1926 to only 13 percent in 1950, and western production has had a corresponding increase to 59 percent in 1950.

Zinc occurrences have been reported in 18 of Washington's 39 counties, but production has been mainly from Okanogan, Ferry, Stevens, Pend Oreille, and Chelan Counties, the last 3 counties having accounted for almost all the Washington production in recent years. Among the zinc mines in the United States, the Pend Oreille mine in Pend Oreille County ranked 35th in production in 1949, the Holden mine in Chelan County was 50th, and the Grandview mine in Pend Oreille County was 58th. The following year the Grandview was the leading producer in Washington and ranked 25th nationally. In 1952 the state's leading zinc producers in order of output were the Pend Oreille, Grandview, Deep Creek, and Holden mines. The Van Stone mine in Stevens County began production late that year and was one of the leading producers in 1953. Among the zinc districts in the United States in 1950, the Metaline district ranked 14th in output; the Lake Chelan district, 28th; and the Northport, 33rd.

The first recorded production of zinc in Washington was from the Oriole mine in the Metaline district in 1911. There appears to have been no further production until 1915, but since that time output has been continuous (except for 1919) to the present. Total production in the state through 1952 has been 228,091 short tons of metal, valued at \$49,243,324, which is 22.7 percent of the total value of all metals produced in the state during the same period. The record annual output was in 1953, when 32,890 short tons, valued at \$7,170,020, was produced. This was more than triple the zinc output in the state 4 years earlier.

Prices—Zinc prices have fluctuated widely both over long-term and short-term periods, and market quotations change frequently. The annual average price from 1900 through 1914 was between 4 and 5 cents per pound but jumped to 14 cents in 1915 and dropped back to 4½ cents by 1921. It had risen to nearly 8 cents by 1924 but dropped to an all-time low of about 3 cents in 1932. This annual average price rose to 6½ cents by 1937 but dropped to 4½ cents the following year and climbed again by 1942 to 8¼ cents, where it remained through the war years until 1946. After Government controls were lifted the annual average price rose to 18.2 cents per pound by 1951, only to drop back again to 16.6 cents the following year and to 11.1 cents in 1953. Early in 1954 the price was 9.25 cents, but by June 1955 it was back up to 12.75 cents. The

1949 high quotation of 17½ cents and low of 9 cents illustrate the extreme fluctuations even in "normal" times, as do the 1952 prices, which included a low of 12½ cents and an all-time high of 19½ cents.

Ore minerals—There are no authenticated occurrences of native zinc, but the element has been reported in almost 150 minerals in the Franklin Furnace district of New Jersey, alone. However, only 6 minerals are common sources of the metal, and by far the most important of these is the sulfide, sphalerite, ZnS , containing 67.0 percent zinc. The others are the carbonate, smithsonite, $ZnCO_3$, containing 52.0 percent zinc; the hydrous silicate, hemimorphite (calamine), $(ZnOH)_2SiO_3$, containing 54.2 percent zinc; the oxide, zincite, ZnO , containing 80.3 percent zinc; the silicate, willemite, Zn_2SiO_4 , containing 58.5 percent zinc; and the ferrite, franklinite, $(Fe,Zn,Mn)O \cdot (Fe,Mn)_2O_3$, containing from 15 to 20 percent zinc. Of these minerals, the last three are important ore minerals in few, if any deposits other than those in the unique Franklin Furnace district. Of the ore minerals, only sphalerite and smithsonite have been reported in Washington, but the comparatively rare zinc basic carbonate, hydrozincite, $2ZnCO_3 \cdot 3Zn(OH)_2$, occurs in the Covada district and in a few other places in the state.

Geology—Most ores of zinc are ores of lead also, although there are a few straight zinc ores and a few large copper-zinc deposits. In Washington most of the zinc comes from zinc-lead deposits, but the Holden mine produces copper-zinc ore with appreciable values in gold and very low values in silver, and in many smaller deposits zinc is associated with a variety of other minerals in complex ores. Zinc may occur as open-space fillings or replacements in veins, and as residual deposits of oxidized zinc minerals. It may also occur as massive replacement deposits of irregular shape, in which the ore minerals are disseminated in limestone or dolomite and are sometimes accompanied by pyrite and frequently by chert or other forms of low-temperature silica minerals. The disseminated replacements in some districts are near the contact of carbonate rocks with granitic rocks, but in other important zinc districts the igneous sources of the hydrothermal solutions presumably responsible for the metalization are far removed or not exposed at all.

The grade of ore mined varies from a low of about 2 percent combined lead and zinc to a high of 8 percent or more. In 1949 the recovery from western states ore averaged 4.86 percent zinc and 3.20 percent lead, whereas the recovery from the generally larger and less complex ore deposits in the Tri-State district averaged only 1.66 percent zinc and 0.69 percent lead. The 1952 production from one large mine in the Metaline district in Washington averaged 2.29 percent zinc and 1.39 percent lead.

OCCURRENCES

The maps showing the numbered zinc occurrences are plates 24, 25, and 26, on pages 61, 63, and 65 in volume 2.

CHELAN COUNTY

Billy Jack (1)

(see under lead)

Bismarck (13)

Loc: NE¼ sec. 12, (31-18E), between Meadow and Cascade Creeks. **Prop:** 3 claims. **Owner:** Roger Hale and Albert Mitchell (1947). **Ore:** Zinc, copper. **Ore min:** Arsenopyrite, pyrite, sphalerite, reportedly copper sulfides. **Deposit:** A 2-in. to 1-ft. quartz vein in granite gneiss. Sulfides constitute only 1% of the vein. **Dev:** 120-ft. adit. **Ref:** 63, p. 81. 67, p. 31. 158.

Black Warrior (5)

(see under copper)

Cascade Consolidated (6)

(see under silver)

Clagstone (2)

(see under lead)

Doubtful (7)

(see under lead)

Ellen

(see Van Epps under antimony)

Galena (8)

(see under lead)

Holden (16)

(see under copper)

Horseshoe Basin (9)

(see under lead)

Howe Sound

(see Holden under copper)

Irene

(see Holden under copper)

Keefer Brothers (17)

(see under molybdenum)

King Solomon (12)

(see under copper)

King Solomon (Van Epps)

(see Van Epps under antimony)

Kingman

(see Galena under lead)

Logan (4)

(see under lead)

Orphan Boy (14)

(see under silver)

Panama No. 2 (10)

(see under lead)

Red Mountain (18)

(see under copper)

Royal

(see Red Mountain under copper)

Silver Jack (3)

(see under lead)

Silver Trail (15)

(see under copper)

Snook and Ellen

(see Van Epps under antimony)

Spokane Boy and Girl (11)

(see under copper)

Tiger

(see Galena under lead)

Van Epps (19)

(see under antimony)

CLALLAM COUNTY

Angeles Star (Winter, Gregory-Savage) (1)

Loc: Sec. 6, (29-6W), on Cowan Cr., a tributary to Little R. **Elev:** 1,490 to 1,810 ft. **Access:** 6 mi. by road and 3½ mi. by trail from railroad at Port Angeles. **Prop:** 8 claims. **Owner:** Byron Winter, Tacoma, Wash. (1942). **Ore:** Zinc, gold, copper. **Ore min:** Sphalerite, chalcopyrite, pyrite. **Gangue:** Quartz. **Deposit:** Two 6-in. veins and a 36-in. vein reported. **Dev:** 166-ft. adit, 225-ft. adit, 200-ft. adit. **Assays:** Tr. to 0.02 oz. Au, 0.90% to 8.91% Zn. **Ref:** 158.

Gregory-Savage

(see Angeles Star)

Savage

(see Angeles Star)

Winter

(see Angeles Star)

CLARK COUNTY

Silver Star (1)

(see under copper)

COWLITZ COUNTY

Green Mountain (1)

(see under gold)

FERRY COUNTY

Abe Lincoln (54)

(see under copper)

Addie B (56)

(see under copper)

Addison (61)

(see under copper)

Advance (28)

(see under silver)

American Granby

(see under copper)

Apex

(see Big Chief under lead)

Apollo

(see California under gold)

Big Chief (29)

(see under lead)

Big Lake (9)

(see under lead)

Black Hawk (30)
(see under lead)

Blevins
(see Meadow Creek under copper)

Blue Mountain
(see Jennie under gold)

Cabin
(see Advance under silver)

California (7)
(see under gold)

Chief
(see Big Chief under lead)

Chief Barnaby (8)
(see under silver)

Cold Spring (12)
(see under lead)

Comstock (1)
(see under copper)

Consolidated Mines and Smelting Co., Ltd.
(see under copper)

Copper Prince
(see under silver)

Cougar (64)
(see under copper)

Cuba
(see Big Lake under lead)

Curlew
(see under lead)

Dan Patch (13)
(see under silver)

Dill (17)
(see under lead)

Drummond (31)
(see under lead)

Gold Twenty (10)
(see under gold)

Golden Cord (62)
(see under silver)

Goldsmith (11)
(see under lead)

Great Northern (52)
(see under silver)

Great Scott (14)
(see under lead)

Henneway (49)
(see under lead)

Humboldt (65)
(see under copper)

Illinois (66)
(see under copper)

Iron Creek
(see Shamrock under nickel)

J. H. E. (15)
(see under lead)

Jennie (5)
(see under gold)

Jumper (67)
(see under copper)

Kentucky Bell (32)
(see under lead)

Keystone (18)
(see under silver)

King Richard
(see Meadow Creek under copper)

La Fleur
(see Comstock under copper)

Lancaster (2)
(see under copper)

Laurier
(see Talisman under copper)

Legal Tender (33)
(see under lead)

Lone Pine (34)
(see under lead)

Longstreet (35)
(see under silver)

McJunkin (48)
(see under silver)

Meadow Creek (55)
(see under silver)

Meteor (19)
(see under silver)

Mono (53)

Loc: Near center S½ sec. 13, (30-32E), Keller dist. **Ore:** Zinc, silver, lead. **Ore min:** Sphalerite, galena, pyrite. **Gangue:** Granite. **Deposit:** Shear zone in granite 6 ft. or more wide. Outcrop is a heavy gossan beneath which are bunches of pyrite as large as 3 ft. in dia. Also veinlets up to 2 in. wide of solid sulfides. **Dev:** 30-ft. adit. **Assays:** Sample from one of veinlets assayed 23.7% Zn, 1.4% Pb, 5.44 oz. Ag. **Ref:** 46, p. 144. 122, p. 127.

Montana (20)
(see under silver)

New York (21)
(see under lead)

Nez Perce (42)
(see under lead)

North Star (57)
(see under lead)

Ophir (58)
(see under lead)

Oregon
(see Illinois under copper)

Pacific Mutual
(see Addison under copper)

Panama (3)
(see under gold)

Patterson
(see Jennie under gold)

Paulsen (43)
(see under lead)

Plymouth Rock (39)
(see under lead)

Polepick (68)
(see under copper)

Poor Man's Hope (63)
(see under lead)

Prescott (22)
(see under lead)

Rattlesnake (44)
(see under lead)

Ren Rice (16)
(see under lead)

Renner Lake (6)
Loc: Sec. 6, (37-37E), Boyds area. **Ore:** Zinc. **Prod:** 1925.
Ref: 97, 1925, p. 558.

Robert E. Lee (36)
(see under antimony)

Romulus (23)
(see under lead)

Rover Bonanza (59)
(see under silver)

Royal Ann (37)
(see under lead)

San Poil Monitor
(see Meadow Creek under copper)

Several (24)
(see under lead)

Shamrock (50)
(see under nickel)

Silver Bell (45)
(see under lead)

Silver Leaf (46)
(see under silver)

Silver Plume (40)
(see under lead)

Silver Queen (41)
(see under lead)

Silver Spar (38)
(see under lead)

Stotesbury (51)
Loc: NW¼ sec. 28, (30-35E), Keller dist. **Prop:** 1 claim.
Owner: Robert Stotesbury (1913). **Ore:** Zinc. **Ore min:** Sphalerite, pyrite. **Gangue:** Iron-stained quartz. **Deposit:** Cellular quartz vein 30 in. wide in a dike rich in hornblende. Vein carries small percentages of pyrite and sphalerite. **Ref:** 46, p. 158. 122, p. 140.

Stray Dog (25)
(see under silver)

Summit (60)
Loc: Near SW cor. sec. 31, (30-34E), Keller dist. **Ore:** Zinc, silver, copper, lead. **Ore min:** Sphalerite with some galena, pyrite, chalcopyrite, specularite. **Gangue:** Quartz, epidote. **Deposit:** Pendant of argillite and quartzite cut by small dikes of pegmatite. Samples on dump of shaft indicate a mineralized quartz vein at least 1 ft. wide. **Dev:** 2 shafts. **Assays:** Sample from dump somewhat richer than av. assayed 14.2% Zn, 5.4% Cu, tr. Au, 17.7 oz. Ag. Small pile of selected ore contained est. 20% in aggregate sulfides. **Ref:** 46, p. 153. 122, p. 131.

Talisman (4)
(see under copper)

Vernie (26)
(see under lead)

Walla Walla
(see under copper)

White Rose (27)
(see under lead)

Yellowstone (47)
(see under lead)

KING COUNTY

Aces Up (18)
(see under silver)

Anderson (3)
(see under iron)

Baring
(see Anderson under iron)

Bear Basin (10)
(see under silver)

Cleopatra (11)
(see under silver)

Coney Basin (13)
(see under gold)

Copper Plate
(see Seattle-Cascade under silver)

Dawson (14)
(see under lead)

Dutch Miller (21)
(see under copper)

Goat Mountain (20)
(see under lead)

Guye (22)
(see under iron)

Jack Pot (19)
Loc: SW¼ sec. 27 and S½ sec. 28, (25-10E), on W. side of Cougar Cr. **Elev:** 4,740 ft. **Access:** Trail from Lennox Cr. and 28 mi. by road to railroad at North Bend. **Prop:** 8 unpatented claims and a millsite. **Owner:** Robert Prufer, North Bend, Wash. (1947—). **Ore:** Zinc, lead, gold, silver, copper, tungsten. **Ore min:** Scheelite, pyrite, chalcopyrite, sphalerite. **Gangue:** Quartz, tourmaline. **Deposit:** Discontinuous aligned mineralized fractures. Best showing is a lenticular vein 2 ft. wide at top of a cliff and 10 ft. wide 50 ft. lower. **Assays:** 7 samples av. 0.03 oz. Au, 0.57 oz. Ag, 5.67% Zn, 0.89% Pb. **Ref:** 11-A, pp. 204-207. 158.

King and Kinney (15)
(see under copper)

Kinney
(see King and Kinney under copper)

Langer (7A)
Loc: Sec. 17, (25-10E), on N. side of Lennox Cr. about 1½ mi. above its mouth, Buena Vista dist. **Access:** Road. **Ore:** Zinc, copper. **Ore min:** Sphalerite, chalcopyrite, pyrrhotite. **Deposit:** 4-in. seam of sphalerite with some chalcopyrite and pyrrhotite in metasediments near granodiorite contact. **Dev:** 20-ft. adit. **Ref:** 11-A, pp. 231-232.

Last Chance (8)
(see under gold)

Lennox (7)
(see under gold)

Mohawk (4)
(see under lead)

Mona
(see Mono under copper)

Mono (9)
(see under copper)

Mt. Logan
(see Guye under iron)

Mount Phelps (5)
Loc: Secs. 5, 6, 7, and 8, (25-10E), on S. slope of Mt. Phelps, Buena Vista dist. **Elev:** 1,900 to 2,400 ft. **Access:** Reached from North Bend by 24 mi. of graveled road. **Prop:** 50 unpatented claims. **Owner:** Priestly Mining & Milling Co. (1947). **Ore:** Zinc, copper, also gold, silver, and lead reported. **Ore min:** Magnetite, pyrite, sphalerite, chalcopyrite, arsenopyrite. **Gangue:** Epidote. **Deposit:** Dark-colored dike rock in granite is sparsely mineralized along joints. **Dev:** 60-ft. adit and several open cuts mostly in barren rock. **Assays:** Reported to be uniformly about \$5.00 Au, Ag, Pb, Zn. **Ref:** 158.

Philippi Lake (6)
(see under lead)

Ryland
Loc: Secs. 8 and 9, (25-10E). **Prop:** 6 patented claims. **Owner:** Dwight W. Johnson, Kent, Wash. (1956—). Rushing Milling & Mining Co. (1903). **Ore:** Zinc. **Dev:** 3 adits. **Ref:** 158.

Salmon Creek (1)
(see under gold)

Seattle-Cascade (16)
(see under silver)

Silver Dollar and Copper Plate
(see Seattle-Cascade under silver)

Silver Star (12)
(see under silver)

Sockless Jerry
(see Last Chance under gold)

Summit
(see Guye under iron)

Three S Gulch (17)
Loc: NW¼ sec. 16, (25-11E), Miller R. dist. **Access:** Road. **Owner:** Alexander Mining Co., Seattle, Wash. (1952—). **Ore:** Zinc, lead. **Ore min:** Sphalerite, galena, chalcopyrite. **Deposit:** Mineralized shear zone in granodiorite. Vein is 6 to 9 in. thick. **Ref:** 133-A, p. 32.

Treasury Lead (2)
(see under lead)

Triple S
(see Seattle-Cascade under silver)

KITTITAS COUNTY

Camp Creek (2)
(see under silver)

Esther and Louisa (1)
(see under silver)

LEWIS COUNTY

Eagle Peak (1)
(see under copper)

Mineral Creek (2)

Loc: Lease lots 2 and 4, SW¼ sec. 30, (14-6E), on Mineral Cr. **Access:** 5 mi. SE. of Mineral by logging railroad. **Owner:** State land leased by John M. Allen, Tacoma, Wash. (1949). **Ore:** Zinc, lead, silver, arsenic. **Ore min:** Sphalerite, galena, realgar. **Assays:** Sample said to have been taken across a 300-ft. face assayed 3.80% Zn, 3.60% Pb, 2.56 oz. Ag. **Prod:** Reportedly 1,000 tons of arsenic ore in 1903, some production in 1904 and 1905. **Ref:** 130, p. 60. 141, p. 54. 158.

LINCOLN COUNTY

Crystal (1)
(see under lead)

Fouress (Pitney Butte) (2)

Loc: SW¼NW¼ sec. 32, (28-37E), in steep valley on NW. side of Pitney Butte. **Elev:** 1,900 ft. **Access:** Road, 20 mi. to Davenport. **Prop:** 5 claims: Lost Stake, Valley, Silver Butte, Hill Top, Lakeview. **Owner:** Fouress Mines, Inc., Olympia, Wash. (1950—). **Ore:** Silver, zinc, lead, gold, copper. **Ore min:** Sphalerite, ruby silver, native silver. **Deposit:** A discontinuous quartz vein 1 to 4 ft. wide and traceable for 100 ft. is enclosed in granite. Vein shows mineralization for about 40 ft. **Dev:** 500-ft. adit, three 100-ft. shafts. **Assays:** Typical analysis said to be 7% Zn, 1% Pb, 0.6% Cu, 1% Sb, 0.05% As, 0.87 oz. Ag, 0.04 oz. Au. **Ref:** 133, p. 33. 158.

Pitney Butte
(see Fouress)

Valley View (3)

Loc: Sec. 32, (28-37E). **Elev:** 2,400 ft. **Access:** 19 mi. from Davenport by road. **Prop:** 1 claim: Valley View (formerly J. B.). Probably part of the Fouress property. **Owner:** D. V. Smith, H. M. Smith, C. J. Sprowls (1941). **Ore:** Zinc, lead. **Ore min:** Sphalerite, galena, pyrite. **Deposit:** Granite cut by quartz veins 1½ to 2 ft. wide with scattered bunches of sulfides. **Dev:** 2 adits. Lower adit 100 ft. long, the other adit 100 ft. higher is 80 ft. long and has a 60-ft. drift. A 50-ft. shaft at portal of upper adit. **Assays:** Low grade. **Ref:** 158.

MASON COUNTY

Black and White (1)
(see under copper)

OKANOGAN COUNTY

Alder (14)
(see under gold)

American Flag (8)
(see under gold)

American Flag (66)
(see under copper)

Anchor (87)
(see under silver)

Anna (84)
(see under silver)

Antimony Queen (16)
(see under antimony)

Apache (88)
(see under silver)

Apex (60)
(see under copper)

Arizona
(see Horn Silver under silver)

- Arlington (56)**
(see under silver)
- Atkins (67)**
(see under lead)
- Ben Harrison**
(see Apex under copper)
- Billy Goat (1)**
(see under copper)
- Boundary**
(see Wolframite under tungsten)
- Bunker Hill**
(see Silver King under lead)
- Butcher Boy (62)**
(see under gold)
- Caaba**
(see Kaaba under lead)
- Cabin (89)**
(see under lead)
- California (21)**
(see under copper)
- Carr (2)**
(see under copper)
- Castle Creek (68)**
(see under lead)
- Catherine (22)**
(see under silver)
- Central (Trinidad) (39)**
(see under silver)
- Central (American Flag)**
(see American Flag under gold)
- Chief Sunshine (40)**
(see under silver)
- Cliff (69)**
Loc: SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 11, (33-31E), Park City dist. **Ore:** Zinc. **Ore min:** Sphalerite, pyrite. **Gangue:** Calcite. **Deposit:** Brecciated zone in argillite, breccia cemented by calcite and sparsely mineralized with sphalerite and pyrite. **Dev:** Short adits and pits. **Ref:** 46, p. 181. 122, pp. 96-97.
- Climax (6)**
(see under copper)
- Continental**
(see Mazama Queen under gold)
- Controller (92)**
(see under copper)
- Copper King (42)**
(see under lead)
- Copper World Extension (34)**
(see under copper)
- Cornwall (4)**
(see under lead)
- Crystal Butte (64)**
(see under gold)
- Daisy (5)**
(see under gold)
- Dixie Queen**
(see Antimony Queen under antimony)
- Double Eagle**
(see Dry Bone under lead)
- Dry Bone**
(see under lead)
- Duke of Windsor**
(see Dry Bone under lead)
- Esther (43)**
(see under lead)
- Eureka (80)**
Loc: Sec. 9, (31-30E), Nespelem dist. **Access:** 33 mi. from railroad at Omak. **Ore:** Zinc. **Ore min:** Sphalerite, magnetite, specularite. **Deposit:** Discontinuous lenses 2 to 6 in. wide in zone 21 ft. wide. Contact deposit in metamorphic rock surrounded by granite. Irregularly distributed small high-grade lenses. **Ref:** 158.
- Evening (86)**
(see under silver)
- Ferris R. Ford**
(see Wolframite under tungsten)
- First Thought (53)**
(see under silver)
- Four Metals (23)**
(see under lead)
- Gold Crown**
(see Spokane under gold)
- Gold Hill (37)**
(see under gold)
- Golden Zone (20)**
(see under gold)
- Gould & Curry (90)**
(see under lead)
- Great Metals**
(see Anchor under silver)
- Great Western (81)**
(see under lead)
- Grubscher**
(see Gubser under lead)
- Gubser (44)**
(see under lead)
- Hanks (3)**
(see under copper)
- Hargrove**
(see Silver King under lead)
- Hatfield**
(see Wolframite under tungsten)
- Hercules (77)**
(see under lead)
- Hiawatha (33)**
(see under gold)
- Hidden Treasure (Highland) (17)**
(see under gold)
- Highland (18)**
(see under gold)
- Highland Light**
(see Highland under gold)
- Horn Silver (29)**
(see under silver)

Hudnut (Hudnutt) (85)

Loc: Near center sec. 17, (31-30E), on W. shoulder of Multnomah Hill, Nespelem dist. **Access:** 5 mi. by road W. of Nespelem. **Prop:** 1 claim. **Owner:** F. O. Hudnut (t) (1913). **Ore:** Zinc, molybdenum, copper, gold, silver. **Ore min:** Sphalerite, molybdenite, chalcopryrite, pyrite. **Gangue:** Quartz, fluorite. **Deposit:** 18-in. quartz vein in rusty sericitized granite (containing sphalerite and pyrite). Small amounts of pyrite, chalcopryrite, molybdenite, sphalerite, and fluorite in the wall rock. **Dev:** Open cuts and pits. **Ref:** 46, p. 194. 58, p. 31. 122, pp. 79-80.

Independent (78)

(see under lead)

Iron Cap and Snow Cap (9)

(see under gold)

Iron Dike (76)

Loc: Sec. 4, (33-31E). **Access:** Adjoins the site of Park City on the SE. **Owner:** John Redmond (1913). **Ore:** Zinc, copper, gold, silver. **Ore min:** Sphalerite, pyrite, pyrrhotite, chalcopryrite. **Gangue:** Gabbro, quartz, calcite. **Deposit:** Mineralized gabbro dike 100 ft. wide and several hundred ft. long. Sulfides occur as bands and disseminations. **Dev:** 2 short crosscuts and a few pits. **Assays:** Av. sample across 55 ft. assayed 3.2% Zn, 0.3% Cu, tr. Au, tr. Ag. Sample from face of richer adit assayed 6% Zn, 0.05% Cu, tr. Au. **Ref:** 46, pp. 186-187. 122, pp. 97-98.

Iron Mask

(see Copper World Extension under copper)

Josie

(see Hiawatha under gold)

Jupiter

(see Tip Top under copper)

Kaaba (24)

(see under lead)

Kaaba-Texas

(see Kaaba under lead)

Key (45)

(see under silver)

Kimberly (32)

(see under lead)

Lady of the Lake (51)

(see under silver)

Last Chance (54)

(see under silver)

Little Chopaka (25)

(see under lead)

Lone Star (41)

(see under lead)

McGrath (26)

Loc: SE $\frac{1}{4}$ sec. 14, (40-25E), $\frac{1}{2}$ mi. S. of Nighthawk. **Prop:** 4 unpatented claims. **Owner:** R. W. McGrath and A. Allemandi, Nighthawk, Wash. (1934). **Deposit:** Vein 2 to 3 ft. wide. **Dev:** Several thousand ft. of adits. **Assays:** Nil to 6.25 oz. Ag, nil to 11.9% Zn. **Ref:** 158.

Malott (59)

(see under copper)

Maquae

(see under gold)

Mazama Queen (7)

(see under gold)

Mid Range (10)

(see under gold)

Mineral Hill (46)

(see under silver)

Minnie (15)

(see under gold)

Modoc (82)

(see under copper)

Mohawk

Loc: 5 mi. NW. of Nespelem. **Ore:** Zinc, silver, chromium. **Assays:** 4 samples showed: tr. to 8.4 oz. Ag, 4.4% to 14.5% Zn. One sample showed: 40.2% Fe, 2.8% Cr. **Ref:** 158.

Monitor (47)

(see under lead)

Mother Lode

(see Crystal Butte under gold)

Mountain Boy (70)

(see under lead)

Nevada (55)

(see under silver)

New Deal

(see Antimony Queen under antimony)

Okanogan Free Gold (31)

(see under gold)

Olentangy (61)

(see under gold)

Oriental & Central

(see American Flag under gold)

Owasco

(see Okanogan Free Gold under gold)

Peacock (52)

(see under silver)

Pinnacle (35)

(see under gold)

Poorman (71)

Loc: SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 11, (33-31E), Park City dist. **Ore:** Zinc, lead. **Ore min:** Pyrite, galena, sphalerite. **Deposit:** 6- to 18-in. quartz vein in argillite sparsely mineralized. **Dev:** 100-ft. adit. **Prod:** 1937. **Ref:** 46, p. 181. 122, p. 97.

Pyrargyrite

(see Ruby under silver)

Ramore (79)

(see under lead)

Rattlesnake (13)

(see under gold)

Rebecca (94)

(see under copper)

Red Bird (93)

(see under copper)

Reedy

(see Antimony Queen under antimony)

Rich Bar (30)

(see under copper)

Ruby (28)

(see under silver)

Salmon River (48)

(see under silver)

- Security (36)**
(see under copper)
- Seven Devils**
(see Mineral Hill under silver)
- Sharp & Balthus (72)**
Loc: NW¼ sec. 11, (33-31E). **Access:** ½ mi. N. of Park City along the road to Gold Cr. **Ore:** Zinc, lead, silver. **Ore min:** Pyrite, galena, sphalerite. **Gangue:** Quartz. **Deposit:** Bedding vein 2 ft. av. width in sheared argillite. Vein is quartz carrying small percentages of ore minerals. **Dev:** 40-ft. upper adit, lower adit. **Ref:** 46, p. 182. 58, p. 61. 122, p. 97.
- Sherman (58)**
(see under lead)
- Silver King (49)**
(see under lead)
- Silver Mountain (38)**
(see under silver)
- Silver Seal**
(see Antimony Queen under antimony)
- Silver Star**
(see Silver Mountain under silver)
- Six Eagles**
(see Little Chopaka under lead)
- Snow Cap**
(see Iron Cap and Snow Cap under gold)
- Snowshoe (73)**
(see under lead)
- Sonny Boy (57)**
(see under silver)
- Spokane (11)**
(see under gold)
- Standard**
(see Sherman under lead)
- Star**
(see Lone Star under lead)
- Summit (74)**
(see under lead)
- Summit (27)**
(see under silver)
- Sunshine**
(see Hidden Treasure under gold)
- Sunshine Chief**
(see Chief Sunshine under silver)
- Tip Top (91)**
(see under copper)
- Tomlinson**
(see under copper)
- Tough Nut (50)**
(see under silver)
- Triangle**
(see Hidden Treasure under gold)
- Trinidad**
(see Central under silver)
- Twin Pine (83)**
Loc: Secs. 4, 5, and 8, (31-30E). **Elev:** 2,550 ft. **Access:** 6 mi. NW. of Nespelem by road. **Prop:** 8 claims. **Owner:** Eugene Smith, Nespelem, Wash. (1943-1948). **Ore:** Zinc, iron, copper, gold, silver. **Ore min:** Magnetite, sphalerite, chalcopyrite, scheelite, hematite, malachite, bornite, chalcocite, azurite, possibly molybdenite. **Gangue:** Quartz, garnet, epidote, calcite, actinolite, fluorite. **Deposit:** Roof pendant of sediments replaced and mineralized by intrusive granite. Appears to be promising zinc property. **Dev:** 350-ft. adit, two shorter adits, 5 shafts, some open cuts. **Assays:** Reportedly \$1.25 to \$90 Cu, Au, Ag. Parts of the rock consist of 25% to 80% magnetite. **Prod:** Reported to have produced. **Ref:** 158.
- Twisp View (12)**
(see under gold)
- Wasco (75)**
(see under silver)
- Washington Consolidated**
(see Mineral Hill under silver)
- West King**
(see under silver)
- Whitestone (65)**
(see under gold)
- Wolframite (19)**
(see under tungsten)
- Yakima (63)**
(see under copper)

PEND OREILLE COUNTY

Ace Ten Spot (78)

Loc: Sec. 29, (39-43E), Metaline dist. **Access:** Road. **Prop:** 6 unpatented claims. **Owner:** Abandoned (1941). Formerly Metaline Contact Mines. **Ore:** Zinc, lead. **Deposit:** Small showings in zinc and lead. **Dev:** 200-ft. adit, several open cuts. **Ref:** 29, pp. 39-40.

Ackerlund (99)

(see under copper)

D. Aldrich

(see Lead King under lead)

American Zinc, Lead and Smelting Co.

(see Grandview mine, Dumont, Lead Hill)

Auburn (31)

(see under lead)

Bailey-Hanson

(see Red Top under lead)

Barefoot (95)

(see under silver)

Bead Lake (100)

(see under lead)

Beaty (27)

(see under lead)

Bella May (new adit) (86)

(see also Metaline Mining & Leasing Co.)

Loc: NE¼NE¼ sec. 32, (39-43E), Metaline dist. **Access:** On road on W. side Pend Oreille R., 1½ mi. S. of Metaline Falls. **Owner:** Metaline Mining & Leasing Co., Spokane, Wash. (1952—). **Ore:** Zinc, lead, silver, cadmium. **Ore min:** Sphalerite, galena, pyrite, marcasite, unidentified uranium mineral. **Gangue:** Silicified limestone and dolomite, siderite. **Deposit:** At least 2 replacement bodies in hydrothermally altered Metaline limestone about 150 ft. below the Ledbetter slate. Uranium mineralization appears to be not related to the zinc-lead mineralization. The uranium is contained in thin

coatings (often yellow) along fault surfaces. **Dev:** An adit approx. 6,400 ft. long. More than 12,000 ft. of underground workings. Diamond drill holes. **Improv:** Used primarily as a haulage way. **Assays:** A sample from a fault zone with abnormally large amount of yellow radioactive coating assayed 0.19% U₃O₈. **Prod:** 208,678 tons 1937 through 1943. **Ref:** 46, p. 29. 128, pp. 66-67. 156. 172.

Berkin

(see Wolf Creek under lead)

Blue Bucket (Kroll) (87)

(see also Metaline Mining & Leasing Co.)

Loc: SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 29 and N $\frac{1}{2}$ sec. 32, (39-43E), Metaline dist. **Elev:** 2,500 ft. **Access:** 2 mi. by road from Metaline Falls. **Owner:** Metaline Mining & Leasing Co., Spokane, Wash. (1932—). Spokane Lead Mines (1907-1908). Diamond R. Mining Co. (1918-1924). Riverview Mining Co. (1931). Century Zinc Co. (1932). **Ore:** Zinc, lead, silver. **Ore min:** Sphalerite, galena, smithsonite, cerussite. **Gangue:** Calcite, siderite. **Deposit:** Irregular replacement bodies of various sizes tending to lie along bedding zones, probably within the upper 350 ft. of the Metaline limestone, contain sphalerite and galena associated with silicified dolomite and calcite. **Dev:** 5,000 ft. of underground workings. **Assays:** 6% Zn, 1% Pb, tr. Ag. **Prod:** 1906, 1907, 1916-1918, 1922-1926, 1937-1950. 175,000 tons by 1942, 200 tons per day in 1942. 56,131 tons 1937 through 1943. **Ref:** 29, p. 31. 46, p. 29. 73, pp. 63-67. 97, 1907, 1908, 1917, 1923-1926, 1930. 98, 1922, 1925. 104, 6/15/32, p. 27; 3/15/36, p. 23. 106, 11/19/31; 5/19/32, p. 7; 7/34. 112, 1918, p. 176. 113, 5/36, p. 7; 8/20/36, p. 6. 128, pp. 65-66. 129, pp. 85-86. 141, p. 22. 172.

Blue Jim (93)

(see under silver)

Bluebird

(see Dumont)

Bob Tail and Four Flush (72)

Loc: Sec. 20, (39-43E), Metaline dist. **Access:** $\frac{1}{4}$ mi. from road. **Prop:** 2 unpatented claims. **Owner:** Abandoned (1941). Formerly Metaline Contact Mines. **Ore:** Zinc, lead. **Deposit:** Small showings in zinc and lead. **Dev:** Stripping. **Ref:** 29, p. 39.

Boundary (6)

(see under lead)

Bromide

(see La Sota under silver)

Bunker Hill

(see Lead Hill)

Buzzell

(see Lucky Strike)

Caribou (1)

(see under lead)

Cedar Creek (92)

Loc: Near center NW $\frac{1}{4}$ sec. 13, (38-42E). **Elev:** 3,000 ft. **Owner:** Unclaimed (1935). **Ore:** Zinc. **Ore min:** Sphalerite. **Gangue:** Limestone. **Deposit:** Scattered boulders of mineralized limestone which may or may not be in place. **Dev:** None. **Ref:** 158.

Clark

(see Josephine)

Cliff (20)

Loc: N $\frac{1}{2}$ NE $\frac{1}{4}$ sec. 22, (40-43E), Metaline dist. **Elev:** 2,730 ft. **Access:** About 11 mi. N. of Metaline Falls on the Z Canyon road. **Prop:** 1 patented claim: Cliff. **Owner:** Drumheller Investment Co., Spokane, Wash. (1935-1945). San Ramone Mining

Co. (1924). Pend Oreille Lead & Zinc Co. (1926-1935). **Ore:** Zinc, lead, silver, gold. **Ore min:** Galena, sphalerite. **Gangue:** Silicified dolomite. **Deposit:** Replacement of silicified dolomite. Replacement zone has been exposed 150 ft. on the surface and 112 ft. in one adit. **Dev:** 245 ft. of adits and shafts with 150 ft. of trenching. Diamond drilling. A stope 45 ft. long, 15 ft. wide, 15 ft. high is in the main (200-ft.) adit. **Assays:** One assay said to be typical showed 0.13% Pb, 1.35% Zn. Av. of 13 samples from main adit was 2.5% Zn, tr. Pb covering the interval from 140 to 165 ft. from portal. 848 tons milled in 1944 av. 0.16% Pb, 2.96% Zn. **Prod:** Prior to 1910, 1923-1924, 1944 (848 tons). **Ref:** 5, p. 198. 7, p. 49. 29, p. 37. 49, p. 4. 73, p. 63. 97, 1924, p. 293; 1925, p. 559. 113, 6/17/37, p. 7. 128, pp. 67-68. 158.

Coffin (90)

Loc: SE $\frac{1}{4}$ NW $\frac{1}{4}$ and SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 16, (38-42E), near the head of Jim Cr. **Elev:** 5,000 ft. **Access:** Right of way for a road cleared to property from Smackout Pass road W. of Ione in 1937. **Prop:** 40-acre State lease. **Owner:** A. E. Torelle, Spokane, Wash., has 20-yr. mining lease (1943). **Ore:** Zinc, lead, molybdenum. **Ore min:** Sphalerite, galena, pyrrhotite, molybdenite, pyrite. **Gangue:** Diopside, serpentine, jefferisite, talc, pink diopside, calcite. **Deposit:** Contact metamorphic replacement of dolomite. Mineralized zone is about 25 ft. thick and consists of parallel mineralized seams. **Dev:** A few shallow cuts and adits total about 100 ft. **Assays:** One assay gave 1.8% Zn, 3.6% Pb, 0.1 oz. Ag. Another gave 4.4% Pb, 1.56% Mo. **Ref:** 29, p. 41. 128, p. 65. 158.

Columbia Lead & Zinc Mining Co. (21)

(see also Hoage)

Loc: Secs. 15, 22, and 27, (40-43E), Metaline dist. **Elev:** 2,700 ft. **Access:** About 10 mi. N. of railroad at Metaline Falls by way of Z Canyon road. **Prop:** Includes 7 Hoage claims, 19 other unpatented claims, and 2 patented claims. **Owner:** Columbia Lead & Zinc Mining Co., Spokane, Wash. (1952—). **Ore:** Zinc, lead. **Ore min:** Sphalerite, galena, pyrite. **Gangue:** Dolomite, coarse calcite. **Deposit:** Ore minerals disseminated in silicified dolomite. Mineralized outcrops exposed in several places along the strike for 1,200 ft. One ore body, 51 ft. long, 7 to 15 ft. wide, reported to assay 4% to 23% Pb, Zn. **Dev:** 2 adits total 225 ft., also numerous open cuts. One adit has a stope 18 ft. long and 7 ft. high which does not extend to the limits of the ore. **Improv:** Compressor, drills, track, cars, tools (1952). **Assays:** Composite of many samples of the 30 tons of stockpiled hand-sorted ore showed 4.15% Pb, 11.1% Zn. **Prod:** No shipments, but 30 tons of hand-sorted ore were piled at the mine portal in 1945, and 200 tons of lower grade ore were stockpiled in 1951. **Ref:** 133, p. 32. 158.

Comstock (101)

(see under lead)

Corzine (91)

(see under lead)

Diamond Eagle (75)

Loc: Secs. 19 and 30, (39-43E), Metaline dist. **Access:** No road. **Prop:** 27 unpatented claims. **Owner:** Formerly Metaline Contact Mines but now abandoned (1941). **Ore:** Zinc, lead. **Deposit:** Small showings of zinc and lead. **Dev:** Open cuts. **Ref:** 29, pp. 38-39.

Diamond R. (77)

(see under lead)

Dreadnaught-Emily

(see Hoage)

Dumont (Bluebird) (32)

Loc: Sec. 25, (40-43E) and secs. 30 and 31, (40-44E), on Slate Cr., Metaline dist. **Elev:** 2,600 ft. **Access:** 7½ mi. NE. of Metaline Falls on Slate Cr. road. **Prop:** 48 claims. **Owner:** American Zinc, Lead & Smelting Co., St. Louis, Mo. (1952—). H. L. Kimmel, William and George Dumont (1943-1951). **Ore:** Zinc, lead. **Ore min:** Sphalerite, galena, pyrite. **Gangue:** Dolomite. **Deposit:** Sphalerite and galena disseminated in dolomite. **Dev:** 50-ft. adit, several open cuts. In 1952 the deposit was being explored by means of a \$120,000 diamond drilling program. **Assays:** Ore at junction of Slumber and Slate Creeks is est. to av. 3% Zn. **Ref:** 128, p. 64. 133, p. 30. 158.

Eagle (42)

Loc: Sec. 28, (40-44E), Metaline dist. **Access:** ¼ mi. from road. **Prop:** 3 unpatented claims. **Owner:** Andre Balach, Metaline Falls, Wash. (1941). **Ore:** Zinc, lead. **Deposit:** Replacement deposit in silicified limestone. **Dev:** Open cuts and trenches. **Ref:** 29, p. 49.

Emily

(see Hoage)

Eureka (40)

Loc: Sec. 29, (40-44E), Metaline dist. **Access:** ¾ mi. from road. **Prop:** 5 unpatented claims and 2 fractions. **Owner:** Dumont brothers, Metaline Falls, Wash. (1941). **Ore:** Zinc, lead, silver. **Deposit:** Replacement zone in silicified limestone is exposed on the surface for a length of 1,000 ft. and a width of 50 ft. **Dev:** 80 ft. of adit, numerous open cuts. **Ref:** 29, pp. 54-55.

Fairview-Hoosier (76)

Loc: Secs. 19, 20, and 30, (39-43E), Metaline dist. **Access:** Road. **Prop:** 5 unpatented claims. **Owner:** Pend Oreille Premier Mining Co. (1941). **Ore:** Zinc, lead. **Gangue:** Quartz. **Deposit:** Mineralized fracture zone. **Dev:** 200 ft. of adit, several open cuts. **Ref:** 29, p. 41. 73, pp. 69-70. 158.

Flusey

(see Flusey-Hoopala under lead)

Flusey-Hoopala (30)

(see under lead)

Flying Squirrel

(see Giant-Flying Squirrel)

Four Flush

(see Bob Tail and Four Flush)

Galena Hill

(see Whoopie-Galena Hill)

Gardner (3)

(see also Tom Cat)

Loc: Secs. 3 and 10, (40-43E), Metaline dist. **Access:** Road. **Prop:** 9 unpatented claims, including: Tom Cat, Champion, Ole Olson. **Owner:** E. O. Dressel and associates, Metaline Falls, Wash. (1941). **Ore:** Zinc, lead. **Deposit:** Replacement deposit in silicified limestone has been exposed for 150 ft. by trenching. **Dev:** 80 ft. of shaft and adit, trenches, and 560 ft. of diamond drill holes. **Ref:** 29, pp. 52-53.

General MacArthur (102)

(see under lead)

Georgia Rose-Texas Slim (18)

Loc: Secs. 14 and 23, (40-43E), Metaline dist. **Access:** 1½ mi. from road. **Prop:** 4 unpatented claims. **Owner:** Mr. Pfeiffer and associates, Metaline, Wash. (1941). **Ore:** Zinc, lead. **Deposit:** Replacement deposit in limestone sparsely mineralized. **Dev:** Open cuts partially caved. **Ref:** 29, pp. 45-46.

Giant-Flying Squirrel (22)

Loc: Near center sec. 22, (40-43E), Metaline dist. **Elev:** 3,000 ft. **Access:** About 10 mi. from Metaline Falls on Z Canyon road. **Prop:** 2 unpatented claims: Giant, Flying Squirrel. **Owner:** Sullivan Mining Co., Wallace, Idaho (1952—). James Ehle, Metaline, Wash. (1941). **Ore:** Zinc, lead, silver. **Ore min:** Sphalerite, galena, smithsonite. **Gangue:** Silicified dolomitic limestone and coarse calcite. **Deposit:** Ore minerals disseminated in silicified dolomitic limestone. Ore zone exposed for a length of 300 ft. **Dev:** 3 adits, 373 ft., 50 ft., and 30 ft. long; numerous open cuts and benches. **Improv:** Compressor (1937), several buildings. **Assays:** Est. to av. less than 2% combined lead and zinc. Chip samples from a 3-ft. zone showed no Pb, 7.10% Zn. Sample representing a 12-ft. zone showed 0.50% Pb, 3.45% Zn. **Ref:** 29, p. 56. 51, p. 5. 128, p. 68. 158.

Gilt Top (33)

Loc: Sec. 25, (40-43E), Metaline dist. **Access:** Road. **Prop:** 4 unpatented claims. **Owner:** George Wehnert et al., Metaline Falls, Wash. (1941). **Ore:** Zinc, lead. **Deposit:** Replacement deposit in silicified limestone has been exposed for a length of 400 ft. and a width of 60 ft. **Dev:** Open cuts, stripping. **Ref:** 29, p. 47. 104, 7/15/34, p. 26.

Glass

(see General MacArthur under lead)

Gold Hill (64)

(see under lead)

Grandview mine (68)

(see also Grandview Mines, Inc.)

Loc: Secs. 14, 15, 22, and 30, (39-43E), Metaline dist. **Elev:** 2,400 ft. **Access:** About 2½ mi. by road to railroad at Metaline Falls. **Prop:** 11 patented claims. **Owner:** American Zinc, Lead and Smelting Co., St. Louis, Mo. (1937—), leasing from Grandview Mines Inc., Spokane, Wash. (1929—). **Ore:** Zinc, lead, silver, cadmium. **Ore min:** Sphalerite, galena, smithsonite, cerussite, pyrite, marcasite, and unknown uranium mineral of no commercial importance. **Gangue:** Dolomite, coarse calcite, mountain leather. **Deposit:** Flat-lying irregular massive replacements and disseminations of zinc-lead ore in dolomite. The uranium mineralization is noncommercial and appears to be unrelated to the zinc-lead ore. It occurs in black carbonaceous seams about 0.1 ft. thick, thin fault gouge zones, and as yellow secondary uranium minerals depositing from descending ground waters. **Dev:** Many thousand ft. of underground workings. 28,367 ft. of development work done from 1940 to 1951 inclusive. **Improv:** 750-ton flotation mill, 6 dwellings (1952). **Assays:** 5.5% Zn, 1.5% to 2.0% Pb, tr. Ag. Material from the black carbonaceous seams assayed 0.16% U₃O₈. **Prod:** 1924-1926, 1928-1930, 1940-1955. 1,254,000 tons 1940-1951 inclusive. **Ref:** 29, p. 32. 43, 2/53, p. 148; 5/54, pp. 56-59. 46, pp. 20-28. 73, pp. 59-60. 97, 1924-1926, 1929, 1930, 1941-1952. 104, 7/15/36, p. 30. 108, 10/39, p. 31; 4/43; 5/43. 113, 6/17/37, p. 7. 114, no. 5, 1909, p. 4. 128, pp. 68-69. 133, pp. 30, 34. 156. 158. 172.

Grandview Mines, Inc.

(see also Red Top, Hidden Treasure, Mohawk under lead, and Grandview mine under zinc)

Loc: Northern Pend Oreille and Stevens Counties. **Prop:** Own or lease mineral rights on 9,000 acres, including Grandview mine, Hidden Treasure, Red Top, and many others. **Owner:** Grandview Mines, Inc., Spokane, Wash. (1952—). Leasing Grandview mine to American Zinc, Lead and Smelting Co. **Ore:** Zinc, lead, silver, and other values. **Ref:** 133, p. 34.

Hanley (4)

Loc: NE¼ sec. 10, (40-43E), Metaline dist. **Access:** 1 mi. from road. **Prop:** 1 patented claim: Hanley. **Owner:** Joseph

Drumheller, Spokane, Wash. (1941—), leasing to Columbia Lead & Zinc Mining Co. (1941-1943). **Ore:** Zinc, lead, silver. **Deposit:** Replacement deposit in silicified limestone traceable for 300 ft. on the surface. **Dev:** 20-ft. shaft, large open cut. **Prod:** 2 carloads high-grade lead-silver ore from open cut in the 1880's. **Ref:** 29, p. 35. 68, p. 7. 73, p. 63. 113, 6/11/37, p. 7. 158.

Hansen (105)

(see under gold)

Hanson

(see Red Top under lead)

Hemlock (52)

(see under lead)

Hidden Treasure (62)

(see under lead)

Hoage (Dreadnaught-Emily) (23)

Loc: Center S½ sec. 22, (40-43E), a few hundred ft. NE. of Batay Lk., Metaline dist. **Elev:** 2,700 ft. **Access:** About 10 mi. N. of Metaline Falls on Z Canyon road. **Prop:** 7 unpatented claims. Part of Columbia Lead & Zinc Mining Co., Inc. property (1952). **Owner:** Columbia Lead & Zinc Mining Co., Inc., Spokane, Wash. (1952—). E. J. Hoage, Metaline, Wash. (1941-1948). **Ore:** Zinc, lead. **Ore min:** Sphalerite, galena, pyrite. **Gangue:** Dolomite, coarse calcite. **Deposit:** Ore minerals disseminated in silicified dolomite. Mineralized outcrops exposed in several places along the strike for 1,200 ft. **Dev:** 2 adits total 225 ft., also numerous open cuts. One adit has a stope 18 ft. long, 7 ft. wide, 7 ft. high which does not extend to the limits of the ore. **Assays:** Composite assay of many samples of the 30 tons of stockpiled hand-sorted ore showed 4.15% Pb, 11.1% Zn. **Prod:** No shipments, but 30 tons of hand-sorted ore were piled at the mine portal in 1945 and 200 tons of lower grade ore stockpiled in 1951. **Ref:** 29, p. 56. 52, p. 8. 128, p. 69. 158.

Hoosier

(see Fairview-Hoosier)

Huffman

(see Mule Deer under lead)

Ira Troyer

(see Troyer under lead)

Iron Cap (51)

(see under lead)

Jenny Dee-Snowshoe (50)

(see under lead)

Jim Creek (89)

(see under lead)

Jordan

(see under lead)

Josephine (Clark) (69)

(see also Pend Oreille Mines & Metals Co., and see Sullivan, Hortense under lead)

Loc: S½ sec. 16, (39-43E), on W. side Pend Oreille R., Metaline dist. **Elev:** 2,100 ft. **Access:** About 3 mi. from Metaline Falls on Z Canyon road. **Prop:** 20 claims and 1 fraction. At least 17 claims patented. **Owner:** Pend Oreille Mines & Metals Co., Spokane, Wash. (1934—). Lead-Zinc Co. (1912-1924). Metaline Lead Co. (1924-1926). Pend Oreille Lead & Zinc Co. (1928-1929). **Ore:** Zinc, lead, silver, cadmium. **Ore min:** Sphalerite, galena, pyrite, cerussite, smithsonite, anglesite, marcasite, unidentified uranium mineral. **Gangue:** Calcite, quartz, mountain leather. **Deposit:** Ore disseminated in silicified

dolomite, especially in brecciated zones cemented by calcite. Replacement ore bodies of irregular shape and grade are near top of Metaline limestone, below black slate. Known ore bodies are 5,000 ft. long, as much as 700 ft. wide, and up to 100 ft. thick (1941). Uranium mineralization is not commercial. It is apparently not related to the zinc-lead ore mineralization. It occurs (1) in a small zone of the Josephine dolomite, (2) in black carbonaceous beds 0.05 to 0.2 ft. thick, and (3) as a "skin" on a fault. **Dev:** 3 connected openings, Josephine shaft, Cascade or 500-ft.-level adit, and a new shaft. Over a mile of workings. **Improv:** 750-ton flotation mill, 2,400-ton flotation mill. Complete camp (1956). **Assays:** Composite sample of ore mined during 8 months in 1931 showed 9.5% Zn, 2.0% Pb, 0.02% Cd. Material from black carbonaceous bed showed 0.16% U₃O₈, and material from a fault surface showed 0.08% U₃O₈. **Prod:** 40,000 tons valued at \$275,000 prior to 1919. 243,000 tons prior to 1935. 1936-1955. 187,000 tons in 1949. 273,520 tons in 1951. **Ref:** 5, pp. 196-197. 7, pp. 47-48. 29, p. 33. 46, pp. 7-19. 73, pp. 56-59. 97, 1912, 1915, 1916, 1925, 1926, 1928, 1930, 1931, 1934, 1937-1951. 98, 1918-1926. 104, 7/15/34, p. 26. 108, 4/41, pp. 3-8; 6/49, pp. 14-17. 112, p. 188. 113, 8/20/26, p. 6. 114, no. 5, 1909, p. 54. 128, pp. 72-74. 133, p. 38. 156. 158. 172.

King Tut (58)

(see under lead)

Kroll

(see Blue Bucket)

Kurlew (59)

(see under lead)

Lakeview (12)

Loc: S½ SW¼ sec. 1, (40-43E), on slope N. of Crescent Lk., Metaline dist. **Elev:** 2,700 ft. **Access:** About 15 mi. N. of Metaline Falls on Crescent Lk. road. **Prop:** 4 unpatented claims. **Owner:** Ivar W. Luhr and associates, Metaline Falls, Wash. (1941). **Ore:** Zinc, lead, silver. **Ore min:** Sphalerite, galena, pyrite. **Gangue:** Dolomitic limestone. **Deposit:** Nodules of ore an inch or two in dia. with galena cores and sphalerite borders, in dolomite near a fault. Mineralized zone exposed for 200 ft. in length and 15 ft. in width. **Dev:** 325 ft. of workings, including one 255-ft. adit. **Ref:** 29, p. 49. 106, 12/1/32, p. 9. 128, pp. 69-70. 158.

La Sota (Silver Crest, Bromide) (96)

(see under silver)

La Sota (Troyer)

(see Troyer under lead)

Last Chance (36)

(see under lead)

Last Chance (55)

(see under lead)

Lead Hill (Bunker Hill) (63)

Loc: Secs. 11, 12, 13, 22, 23, 27, and S½NE¼ sec. 14, (40-44E), on upper Slate Cr., Metaline dist. **Elev:** 4,900 ft. **Access:** 15 mi. NE. of Metaline Falls on Slate Cr. road. **Prop:** 50 claims: Lead Hill Nos. 1 to 18, A Z O Nos. 1 to 32. **Owner:** American Zinc, Lead & Smelting Co., St. Louis, Mo. (1945—). Leadhill Mines, Inc. (1931-1934). Bunker Hill & Sullivan Mining & Concentrating Co. (1930). Chas. Bostrom and Ivar Luhr (1941-1944). **Ore:** Lead, zinc, silver. **Ore min:** Galena, sphalerite, smithsonite. **Gangue:** Microcrystalline quartz, dolomite, barite. **Deposit:** Galena and sphalerite disseminated in dolomite and jasperoid. Ore zones are flat-dipping replacements. **Dev:** A 1,400-ft. adit and many surface cuts, shallow adits, and 23,321 ft. of diamond drill holes (1952). **Improv:**

Compressor and shop building, three 100-ton ore bins, access roads (1952). **Assays:** Assays on shipments showed 62.05% Pb, 3.6 oz. Ag; but, as a whole, zinc predominates over lead in the ratio of more than 2 to 1. **Prod:** Small carload of hand-picked galena shipped in 1937. Milled 1,230 tons in 1951, 9,570 tons in 1952. **Ref:** 29, p. 33. 71. 97, 1938, p. 459; 1951, p. 1615. 99, 11/27/34. 104, 11/15/34, p. 27. 106, 2/5/31; 3/19/31; 4/16/31; 6/16/32. 113, 10/34, p. 14. 128, p. 63. 158.

Lead Hill Extension (46)

Loc: Secs. 15, 21, and 22, (40-44E), Metaline dist. **Prop:** 9 unpatented claims. **Owner:** Harry Meyers, Newport, Wash. (1941). **Ore:** Zinc, lead. **Deposit:** Replacement deposit in limestone largely hidden by overburden. **Dev:** Open cuts, mostly in overburden. **Ref:** 29, p. 55.

Lead King (25)

(see under lead)

Lead Metal (65)

(see under iron)

Lead Queen (8)

(see under lead)

Little Noisy (94)

Loc: NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 17, (38-44E), on N. side of Noisy Cr. about 1 mi. above its mouth. **Elev:** 3,500 ft. **Access:** 13 mi. from Ione on the Sullivan Lk. road and $\frac{1}{2}$ mi. by trail up Noisy Cr. Canyon. **Prop:** 6 unpatented claims. **Owner:** I. E. Boswick and A. Krantz, Ione, Wash. (1951). **Ore:** Zinc, lead, silver, gold, copper. **Ore min:** Sphalerite, galena, chalcopyrite, molybdenite, pyrrhotite, scheelite, pyrite. **Gangue:** Quartz, carbonate, tourmaline. **Deposit:** Quartz vein 1 to 4 ft. thick and at least 460 ft. long in metamorphic rocks and granite, also mineralized dolomite. **Dev:** 3 adits, one 230 ft., one 80 ft., and one 950 ft. (caved). A 30-ft. shaft, and an open cut. **Assays:** 0.25% scheelite. Said to run \$1.50 Au. Av. of all values is \$25 per ton. One sample showed 10.5% Pb, 14.9% Zn, 5.05 oz. Ag, 0.03 oz. Au. **Ref:** 29, p. 62. 37, pp. 54-55. 46, p. 35. 68, p. 12. 128, p. 65. 158.

Lloyd (103)

(see under lead)

Lookout (35)

(see under lead)

Lucky Boy (57)

(see under lead)

Lucky Boy Rex (34)

Loc: Sec. 25, (40-43E) and sec. 30, (40-44E), Metaline dist. **Access:** Road. **Prop:** 7 unpatented claims. **Owner:** Dumont brothers, Metaline Falls, Wash. (1941—). **Ore:** Zinc, lead. **Deposit:** Replacement deposit of silicified limestone has been traced on the surface for a length of 200 ft. and a width of 6 to 80 ft. **Dev:** 210 ft. of adits, numerous open cuts. **Ref:** 29, pp. 47-48. 104, 7/15/34, p. 26. 133, p. 30. 158.

Lucky Strike (Buzzell) (37)

Loc: NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 35, (40-43E), on E. side of Pend Oreille R., Metaline dist. **Access:** About 9 mi. from Metaline Falls on the Slate Cr. road. **Prop:** 4 unpatented claims. **Owner:** R. L. Lakin and associates, Spokane, Wash. (1942). Silver-Lead Mining Co. (1907). **Ore:** Zinc, lead, iron. **Ore min:** Sphalerite, pyrite, smithsonite, limonite. **Gangue:** Dolomite, coarse calcite. **Deposit:** Mineralized breccia zone from 0 to 4 ft. in width. Parts of the zone are nearly solid pyrite. Probably less than 100 tons of limonite available. **Dev:** An inclined shaft and several drifts, inaccessible in 1937. **Prod:** 1922, 1925. **Ref:** 29, p. 40. 97, 1923, p. 413; 1926, p. 468. 116, no. 12, 1907, p. 16. 128, p. 71. 158.

MM (13)

(see under lead)

Mack (53)

(see under lead)

Mammoth

(see Morning and Mammoth under lead)

May Thomas

(see under lead)

Maybeso (54)

(see under lead)

Metaline Contact (73)

(see also Metaline Mining & Leasing Co.)

Loc: E $\frac{1}{2}$ SW $\frac{1}{4}$ and W $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 20, (39-43E), Metaline dist. **Elev:** 3,000 ft. **Prop:** 160 acres. **Owner:** Metaline Mining & Leasing Co., Spokane, Wash., lessee (1949). **Ore:** Zinc, lead, silver. **Ore min:** Sphalerite, galena, minor pyrite. **Deposit:** Replacement deposit in brecciated zones along limestone-dolomite contact. **Dev:** 2,500 ft. of raises, 2,650 ft. of drifts, 250 ft. of slabbing. **Ref:** 46, p. 29. 68, p. 13.

Metaline Falls (79)

(see under lead)

Metaline Metals (66)

(see also Pend Oreille Mines & Metals Co.)

Loc: Secs. 2, 10, 11, and 15, (39-43E) and sec. 35, (40-43E), Metaline dist. **Access:** 6 mi. from Metaline Falls by road. **Prop:** 3 patented and 39 unpatented claims. **Owner:** Pend Oreille Mines & Metals Co. (1949). **Ore:** Zinc, lead, silver. **Deposit:** Replacement of silicified limestone. **Dev:** 400-ft. shaft with 2 levels; total about 1,000 ft. of workings. Some diamond drilling. **Assays:** Av. ore runs 4.5% Zn, 1.0% Pb, tr. Ag. **Ref:** 29, p. 34.

Metaline Mining & Leasing Co. (81)

(see also Bella May, Blue Bucket, Riverview, Metaline Contact, Sterling under zinc, and Red Top, Diamond R., Hidden Treasure under lead)

Loc: Secs. 26, 29, 30, 32, and 35, (39-43E), Metaline dist. **Elev:** 2,000 to 3,100 ft. **Access:** $\frac{1}{4}$ mi. S. of Metaline on State Highway 6. **Prop:** 39 claims and 376 acres deeded land, plus other leased property. **Owner:** Metaline Mining & Leasing Co. has operating agreement with Sullivan Mining Co., Wallace, Idaho (1950-1971). **Ore:** Zinc, lead, silver. **Ore min:** Sphalerite, galena, pyrite, marcasite, unidentified uranium mineral. **Gangue:** Silicified limestone and dolomite. **Deposit:** Replacement in dolomitic limestone. **Dev:** Main haulage adit more than 6,000 ft. long. More than 12,000 ft. of workings, diamond drill holes. Completed in 1950: 1,905 of drifting, 532 ft. of raising, 4,673 ft. of diamond drilling. **Assays:** 264,809 tons produced Oct. 1937 through Dec. 1947 av. 7.45% combined lead and zinc. 439,809 tons produced av. 6.55% combined lead and zinc. **Prod:** 410,724 tons of ore valued at \$2,573,294 in 1938-1947. **Ref:** 104, 6/15/32, p. 27; 3/15/36, p. 23. 106, 7/34. 108, 7/39. 113, 8/20/36, p. 6. 133, p. 37. 156. 158. 172.

Mockingbird (29)

(see under lead)

Morning and Mammoth (67)

(see under lead)

Mount Pisgah (104)

(see under lead)

Mountain Goat (5)

(see under lead)

Mule Deer (98)

(see under lead)

O. K. (84)

(see under silver)

Ore Hill (83)

Loc: Secs. 33 and 34, (39-43E), Metaline dist. **Access:** Near road. **Prop:** 10 unpatented claims. **Owner:** Abandoned (1941). **Ore:** Zinc, lead. **Deposit:** Slight mineralization of limestone. **Dev:** Open cuts and stripping. **Ref:** 29, p. 43.

Oriole (74)

Loc: SE. cor. sec. 19, (39-43E), on N. slope of Linton Mtn., Metaline dist. **Elev:** 3,000 ft. **Access:** 1½ mi. from old Metaline on Linton Cr. road. **Prop:** 7 claims and 1 fraction. **Owner:** Arthur Betchart and E. O. Dressel, Jr., Metaline Falls, Wash. (1953—). Oriole Mining & Milling Co. 1907). Metaline Oriole Mining Co. (1911-1924). Metaline Minerals Co. (1922-1924). Frank Schultz (1935). W. L. Schultz, Metaline, Wash. (1942). **Ore:** Zinc, lead, silver, copper, gold. **Ore min:** Sphalerite, galena, tetrahedrite, chalcopyrite, pyrite, malachite, azurite, smithsonite, cerussite, bornite. **Gangue:** Quartz, calcite, dolomite. **Deposit:** Quartz lenses up to 3 ft. wide and 20 ft. long along a gouge breccia seam in dolomite. **Dev:** 2,000 ft. of workings, mostly in 3 adits. **Assays:** Smelter returns on carload of picked ore: 42.1 oz. Ag, 21.9% Zn, 15.3% Pb, 1.12% Cu. **Prod:** 2,000 tons up to 1942. 1911, 1912, 1925, 1926, 1953. **Ref:** 5, pp. 195-196. 7, pp. 46-47. 29, p. 36. 73, pp. 67-69. 97, 1912, 1917, 1926. 98, 1922, p. 1655; 1925, p. 1823. 112, p. 190. 114, no. 5, 1909, p. 56. 116, no. 8, 1907, p. 14. 128, pp. 76-77. 129, pp. 87-88. 141, p. 46. 158.

Pacnor Mines

Loc: Russian Cr. area. **Prop:** 47 claims. **Owner:** Pacnor Mines, Inc., Spokane, Wash. (1952). **Ore:** Zinc, lead. **Ref:** 158.

Pay Day (16)

Loc: Secs. 15 and 22, (40-43E), Metaline dist. **Access:** ½ mi. from road. **Prop:** 1 unpatented claim. **Owner:** Jack Dannelson, Metaline, Wash. (1941). **Ore:** Zinc, lead. **Deposit:** Replacement zone in silicified limestone has been traced on the surface for about 150 ft. in length and 10 ft. in width. **Dev:** 15-ft. shaft, open cut. **Ref:** 29, p. 44.

Pearson (82)

Loc: Sec. 33, (39-43E), Metaline dist. **Access:** Road. **Prop:** 80 acres of deeded land used for farming. **Ore:** Zinc, lead. **Dev:** None. **Assays:** Traces of lead and zinc. **Ref:** 29, p. 44.

Peewee (15)

Loc: Sec. 15, (40-43E), Metaline dist. **Access:** 300 yd. from road. **Prop:** 3 unpatented claims. **Owner:** Jim Ehle, Metaline, Wash. (1941). **Ore:** Zinc, lead. **Deposit:** Replacement of limestone. **Dev:** 40 ft. of tunnel, open cuts. **Ref:** 29, p. 45.

Pend Oreille Iron, Lead, and Zinc (14)

Loc: Sec. 6, (40-44E), Metaline dist. **Prop:** 20 unpatented claims. **Owner:** Abandoned (1941). **Ore:** Zinc, lead. **Deposit:** Slight showings of zinc and lead. **Dev:** Open cuts. **Ref:** 29, pp. 61-62.

Pend Oreille Mines & Metals Co. (70)

(see also Josephine, Metaline Metals, Torrential-Sphinx, Yellowhead under zinc, and Flusey-Hoopala, Washington, Metaline Falls, Riverside, Z Canyon under lead)

Loc: Metaline dist. **Access:** Road. **Prop:** Several hundred acres of deeded property, many claims, including Josephine mine. Also own controlling interest in Reeves MacDonald Mines, Ltd. **Owner:** Pend Oreille Mines & Metals Co., Spokane,

Wash. (1934—). **Ore:** Zinc, lead, silver, cadmium. **Ore min:** Sphalerite, galena, pyrite, marcasite, smithsonite, cerussite, unidentified uranium mineral. **Gangue:** Dolomite, jasperoid, calcite. **Deposit:** Replacement ore bodies of irregular shape and grade are near top of Metaline limestone, below black slate. Known ore bodies are 5,000 ft. long, as much as 700 ft. wide, and up to 100 ft. thick (1941). Uranium mineralization is not commercial. It is apparently not related to the zinc-lead mineralization. It occurs (1) in a small zone of the Josephine dolomite, (2) in black carbonaceous beds 0.05 to 0.2 ft. thick, and (3) as a "skin" on a fault. Gallium and germanium have been detected spectrographically in ore from the Chickahominy claim. **Dev:** More than a mile of underground workings. **Improv:** 750-ton flotation mill and 2,400-ton flotation mill, power plant, apartment house, complete camp (1954). **Assays:** Ore as mined was 5% to 7% Zn and 0.5% to 2% Pb in 1941. Ore produced in 1948 av. 5.87% Zn, 3.57% Pb. 1951 production av. 1.11% Pb, 2.37% Zn. **Prod:** 1927-1955, 3,111 tons valued at \$8.76 per ton in 1915 from Clark property. 123,751 tons of ore in 1948. 186,955 tons in 1949. 186,197 tons of ore in 1950 yielded 9,850,731 lb. Zn, 6,336,653 lb. Pb, 18,000 oz. Ag, 30,000 lb. Cu. 273,580 tons of ore in 1951 yielded 12,950,584 lb. Zn, 6,045,914 lb. Pb, 16,041 oz. Ag. 1952-1955. **Ref:** 1-C, 9/55, pp. 846-849. 43, 7/52, pp. 90-93. 83, 97, 1937-1952. 101, 11/53, pp. 28-29, 105. 108, 4/41; 5/41. 110, 7/48, p. 5. 133, p. 38. 156. 158. 172.

Pine Cone-Z Canyon (19)

Loc: Secs. 22 and 23, (40-43E), Metaline dist. **Access:** ½ mi. from road. **Prop:** 15 unpatented claims. **Owner:** Messrs. Pfeiffer and Dannelson, Metaline, Wash. (1941). **Ore:** Zinc, lead. **Deposit:** Replacement deposit in limestone. **Dev:** Open cuts. **Ref:** 29, p. 45.

Red Crown (38)

(see under lead)

Red Top (61)

(see under lead)

Riverview (28)

(see also Metaline Mining & Leasing Co.)

Loc: Secs. 26 and 35, (40-43E), Metaline dist. **Access:** 1 mi. from road. **Prop:** 5 unpatented claims. **Owner:** Metaline Mining & Leasing Co. (1949). **Ore:** Zinc, lead, silver. **Deposit:** Replacement deposit in silicified limestone. Zone shows only slight mineralization where exposed. **Dev:** 80 ft. of adits, numerous open cuts. **Ref:** 29, p. 44. 46, p. 29. 68, p. 13.

Robert E. Lee (39)

(see under lead)

Rocky Creek (97)

(see under silver)

Saddle (17)

Loc: Secs. 14, 15, 22, and 23, (40-43E), Metaline dist. **Access:** 1¼ mi. from road. **Prop:** Group of claims. **Owner:** Maude Lindstrom, Spokane, Wash. (1941). **Ore:** Zinc, lead, iron. **Deposit:** Replacement deposit in limestone exposed on the surface for about 300 ft. along the strike. **Dev:** 10-ft. adit, numerous open cuts and trenches. **Ref:** 29, p. 61.

Salmon (56)

(see under lead)

Scandinavian

(see Lead Queen under lead)

Silver Crescent (9)

(see under lead)

Silver Crest

(see La Sota under silver)

Silverado

(see Z Canyon under lead)

Slate Creek (47)

(see Whoopie-Galena Hill)

Snowshoe

(see Jenny Dee-Snowshoe under lead)

Sphinx

(see Torrential-Sphinx)

Star (41)

(see under lead)

Star (43)

(see under lead)

Sterling (88)

(see also Metaline Mining & Leasing Co.)

Loc: SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 32, (39-43E), Metaline dist. **Elev:** 2,000 ft. **Access:** On State highway. **Prop:** 10 patented claims. **Owner:** Metaline Mining & Leasing Co., Spokane, Wash. (1932-1949). Sterling Silver-Lead Co. (1915-1926). Century Zinc Co. (1932). **Ore:** Zinc, lead, silver. Cobalt and manganese have been reported but are not now known to occur here. **Ore min:** Galena, sphalerite. **Deposit:** Replacement deposit of Yellowhead type. The replacement deposit near the Bella May group is similar to that at the Metaline Contact property. **Prod:** 1918, 1926. **Ref:** 29, p. 31. 46, pp. 32-33. 68, p. 13. 97, 1918, p. 507; 1926, p. 468. 98, 1922, p. 1666; 1925, p. 1833. 104, 6/15/32, p. 27; 3/15/36, p. 23. 106, 7/34. 112, p. 204. 113, 8/20/36, p. 6.

Sullivan (71)

(see under lead)

Sunshine (49)

(see under lead)

Tamarack (60)

(see under lead)

Texas Slim

(see Georgia Rose-Texas Slim)

Tom Cat (2)

(see also Gardner)

Loc: Center S. line sec. 3, (40-43E), Metaline dist. **Elev:** 2,000 ft. **Access:** $\frac{1}{4}$ mi. E. of road 1 mi. N. of Z Canyon. **Prop:** 1 unpatented claim: Tom Cat (part of Gardner property). **Owner:** E. O. Dressel, Metaline Falls, Wash. (1937-1941). **Ore:** Zinc, lead. **Ore min:** Sphalerite, galena. **Gangue:** Dolomite. **Deposit:** Disseminations in dolomite and silicified carbonate rock. **Dev:** 26-ft. vertical shaft, 14-ft. drift, 2 open cuts, 3 diamond drill holes. **Assays:** 3 diamond drill holes showed 6 ore intersections 4 to 6 ft. thick which showed nil to 15.3% Pb, 0.4% to 1.8% Zn, the av. being 3.2% Pb, 0.9% Zn. 5 channel samples av. 1.1% Pb, 1.3% Zn. **Ref:** 19. 128, p. 74.

Torrell

(see under lead)

Torrential-Sphinx (10)

(see also Pend Oreille Mines & Metals Co.)

Loc: W $\frac{1}{2}$ SW $\frac{1}{4}$ sec. 11, (40-43E), Metaline dist. **Access:** Road. **Prop:** 2 unpatented claims. **Owner:** Pend Oreille Mines & Metals Co. (1941). **Ore:** Zinc, lead. **Ore min:** Sphalerite and some galena. **Deposit:** Replacement of silicified limestone. Ore body has been traced for 200 ft. laterally. **Dev:** 150 ft. of adits, raises, and shafts, and 200 ft. of trenching. **Ref:** 29, p. 35.

Troyer (La Sota, Ira Troyer) (45)

(see under lead)

Twin Lakes (24)

(see under lead)

Uncas (44)

Loc: Sec. 28, (40-44E), Metaline dist. **Elev:** 3,500 to 4,000 ft. **Access:** 2 mi. of trail from Slate Cr. road. **Prop:** 6 claims and 2 fractions. **Owner:** William and George Dumont. **Ore:** Zinc, lead, copper. **Ore min:** Sphalerite, galena, tetrahedrite, copper carbonates. **Gangue:** Dolomite, quartz. **Deposit:** Ore minerals disseminated in dolomitic limestone and in quartz lenses. **Dev:** 2 adits, both caved (1951). **Ref:** 128, p. 64. 158.

Velvet

(see under lead)

Velvet Lode

(see King Tut under lead)

Washington (80)

(see under lead)

Washington Rock

(see Washington under lead)

West

(see Blue Jim under silver)

Whoopie-Galena Hill (Slate Creek) (48)

Loc: Secs. 14, 15, 21, 22, and 28, (40-44E), on Slate Cr., Metaline dist. **Access:** Forest Service road. **Prop:** 18 unpatented claims: Galena Hill Nos. 1 to 8, Whoopie Nos. 1 to 5, May Day, May Day Fraction, Prospect No. 2. **Owner:** Fred E. Davenport and Ira Troyer, Metaline, Wash. (1941). **Ore:** Zinc, lead, silver. **Deposit:** Replacement deposit in silicified limestone. **Dev:** 310 ft. of adits, numerous open cuts. **Ref:** 29, p. 42. 46, p. 34.

Wolf Creek (85)

(see under lead)

Woodpecker (26)

Loc: Sec. 27, (40-43E), Metaline dist. **Access:** $\frac{1}{4}$ mi. from road. **Prop:** 5 unpatented claims. **Owner:** Abandoned (1941). Formerly Metaline Contact Mines. **Ore:** Zinc, lead. **Deposit:** Small showings of zinc and lead. **Ref:** 29, p. 39.

Yellowhead

(see also Pend Oreille Mines & Metals Co.)

Loc: Metaline dist. **Owner:** Pend Oreille Mines & Metals Co. (1930). **Ore:** Zinc, lead. **Ore min:** Sphalerite, galena, pyrite. **Deposit:** In upfaulted block of Metaline limestone. **Ref:** 97, 1930, p. 674. 172, pp. 8, 15.

Z Canyon (Pine Cone-Z Canyon)

(see Pine Cone-Z Canyon)

Z Canyon (Silverado) (11)

(see under lead)

Z Canyon Mutual (7)

Loc: N. center sec. 11, (40-43E), Metaline dist. **Elev:** 2,400 ft. **Access:** 1 mi. by road W. of Crescent Lk. **Ore:** Zinc, lead. **Ore min:** Sphalerite, galena. **Gangue:** Dolomite, calcite. **Deposit:** Sparsely disseminated ore minerals in dolomite and breccia. **Dev:** 400-ft. adit and a few pits and small cuts. **Ref:** 128, p. 75.

PIERCE COUNTY

Golden Rule (1)

Loc: Center E $\frac{1}{2}$ sec. 24, (18-7E). **Access:** 1 mi. by trail N. of Queen Bee cabin. **Prop:** 1 claim (?). **Owner:** R. J. McGillivray, Alder, Wash. (1943). **Ore:** Zinc, molybdenum, copper. **Ore min:** Pyrite, sphalerite, molybdenite, scheelite (?), mala-

chite. **Deposit:** Black hard siliceous vein 18 in. wide in coarse granodiorite. **Dev:** 45-ft. adit. **Ref:** 158.

Silver Creek (3)
(see under gold)

Silver Creek Gold & Lead (2)
(see under gold)

SKAGIT COUNTY

Alta (8)
(see under lead)

Boston (9)
(see under lead)

British
(see Skagit Queen under silver)

Cerrico
(see under lead)

Chicago (10)
(see under lead)

Cliff (14)
Loc: NE $\frac{1}{4}$ sec. 26, (35-13E). **Prop:** 1 claim: Cliff. **Owner:** Wm. Soren, Sedro Woolley, Wash. (1951). **Ore:** Zinc, copper. **Deposit:** Vein 1 ft. thick. **Ref:** 158.

Dorothy
(see Thunder Creek under lead)

Eldorado (12)
(see under silver)

Everett Extension
(see under silver)

Friend (15)
(see under silver)

Great Northern
(see under gold)

Iowa-Olympia
(see under silver)

Johnsburg (13)
(see under lead)

Kildare (16)
(see under lead)

Lakeside
(see under lead)

Logan No. 2 (3)
(see under silver)

Midas (17)
(see under silver)

Olympia
(see Iowa-Olympia under silver)

Pioneer (19)
(see under silver)

Protection (5)
(see under lead)

Silver Tip (6)
(see under lead)

Skagit Queen (2)
(see under silver)

Soldier Boy (18)
(see under gold)

Stenmo (4)
(see under lead)

Stephens (1)
(see under copper)

Thunder Creek (7)
(see under lead)

West Seattle (11)
(see under lead)

SKAMANIA COUNTY

Athens
(see under copper)

Bumble Bee
(see under copper)

Chicago (4)
(see under copper)

Coe
(see Sweden under copper)

Commonwealth (3)
(see under copper)

Golconda (2)
(see under gold)

Gold Creek
(see Zinc Creek)

Last Chance (7)
(see under copper)

St. Helens
(see Sweden under copper)

Snowflake (1)
(see under lead)

Sweden (5)
(see under copper)

Zinc Creek (Gold Creek) (6)
Loc: SW $\frac{1}{4}$ NE $\frac{1}{4}$ and NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 13, (3-5E), on a tributary of Washougal R. **Elev:** 1,450 ft. **Access:** 13 mi. by road and 1 $\frac{1}{2}$ mi. by trail from Cape Horn. **Prop:** State land. **Owner:** Leased by G. A., John, and Axel Bloomquist and Fred McKay, Vancouver, Wash. (1952—). E. G. Judd and Leslie E. Judd, Vancouver, Wash. (1947). **Ore:** Zinc. **Ore min:** Sphalerite, some galena and chalcopryrite. **Gangue:** Quartz, calcite, breccia, siderite. **Deposit:** Shear zone in volcanic rocks cemented by mineralized quartz and calcite. Zone av. 1 to 3 ft. but is 10 ft. wide at one place. **Dev:** 120-ft. drift, shaft, and surface exposures. **Assays:** Zn content of vein est. to be 5%. Au and Ag reported in assays. **Ref:** 158.

SNOHOMISH COUNTY

Ala-Dickson (17)
(see under copper)

Alleghany
(see Foggy under copper)

Blackman
(see Doris under copper)

Bonanza
(see Mineral Center under gold)

Broken Ridge (36)
(see under copper)

Brown
(see Doris under copper)

- Calumet (28)**
(see under gold)
- Calumet (41)**
(see under copper)
- Calumet (Glacier Peak)**
(see Glacier Peak under copper)
- Clara Thompson**
(see Jasperson under gold)
- Commonwealth**
(see Jasperson under gold)
- Cooperative (40)**
(see under copper)
- Darrington**
(see Gold Mountain under copper)
- Doris (29)**
(see under copper)
- Edison**
(see Mineral Center under gold)
- Feldt (2)**
(see under silver)
- Florence Rae (31)**
(see under copper)
- Foggy (23)**
(see under copper)
- "45" (13)**
(see under silver)
- Glacier Peak (9)**
(see under copper)
- Gold Mountain (8)**
(see under copper)
- Good Hope (25)**
(see under gold)
- Gray Mare (3)**
(see under silver)
- Howard**
(see Cooperative under copper)
- Index Gold Mines, Inc. (37)**
(see under gold)
- Iowa (30)**
(see under copper)
- Iowa**
(see Washington-Iowa under copper)
- Jasperson (32)**
(see under gold)
- Kazian (38)**
(see under copper)
- Larson (1)**
(see under lead)
- Lockwood Pyrite (19)**
(see under iron)
- Louise**
(see Mineral Center under gold)
- McCombs**
(see Jasperson under gold)
- Magus**
(see "45" under silver)
- Martin Engdahl (33)**
(see under lead)
- Marvel (42)**
(see under copper)
- Michigan (39)**
(see under gold)
- Milwaukee (14)**
Loc: SE¼ sec. 32, (30-10E), Sultan Basin dist. **Elev:** 2,750 to 2,950 ft. **Access:** A steep trail which leads from Williamson Cr. to Copper Lk. crosses the property. **Prop:** 8 unpatented claims: Milwaukee Nos. 1 to 8. **Owner:** Forrest E. Wing, Tacoma, Wash. (1943-1951). **Ore:** Zinc, lead, gold, silver. **Ore min:** Sphalerite, galena, chalcopyrite, arsenopyrite, pyrite. **Gangue:** Quartz with comb structure. **Deposit:** 2 quartz veins in metamorphic rocks, one 1 to 10 in. thick, the other 6 to 24 in. thick. **Dev:** 25-ft. drift and 2 open cuts. **Assays:** Owners report assay on sample from upper vein showed 10% Zn, 5% Pb, and values in Au and Ag. **Ref:** 23, pp. 46-47. 150, p. 41.
- Mineral Center (20)**
(see under gold)
- Mineral Mines (34)**
(see under copper)
- Mint**
(see Iowa under copper)
- Monte Cristo (24)**
(see under gold)
- Mountain Cedar (18)**
(see under copper)
- Mystery (Monte Cristo, Pride)**
(see Monte Cristo under gold)
- Mystery (Mountain Cedar, Paystreak)**
(see Mountain Cedar under copper)
- Nesta (6)**
(see under copper)
- North Star**
(see Sunrise under gold)
- O and B (22)**
(see under copper)
- Old Gray Mare**
(see Gray Mare under silver)
- Oldfield**
(see Sunrise under gold)
- Palmer**
(see under nickel)
- Paystreak**
(see Mountain Cedar under copper)
- Peabody (26)**
(see under gold)
- Penn**
(see Foggy under copper)
- Perm**
(see under gold)
- Pride**
(see Monte Cristo under gold)
- Queen Anne (7)**
(see under gold)
- Rustler (16)**
(see under copper)

S. M. P. (35)

Loc: Sec. 6, (28-11E), sec. 31, (29-11E), and sec. 1, (28-10E), Silver Cr. dist. **Prop:** 7 patented claims: Fourth of July, Frank, Independence, Merrill, Rambler, Rambler No. 1, Silver Creek. **Owner:** S. M. P. Mining Co., Seattle, Wash. (1949-1950). **Ore:** Zinc, copper, gold. **Ref:** 68, p. 15. 158.

Silver Coin (12)

(see under gold)

Silver Creek

(see Broken Ridge under copper)

Silver Horseshoe (15)

(see under silver)

Silver Queen (27)

(see under gold)

Sunrise (4)

(see under gold)

Threadwell

(see under gold)

Washington-Iowa (21)

(see under copper)

Wayside (10)

(see under copper)

Webster

(see Jasperson under gold)

Whitehorse (5)

(probably same property as Gray Mare under silver)

Loc: Near N. $\frac{1}{4}$ cor. sec. 30, (32-9E) and vicinity, on Whitehorse Mtn., Darrington dist. **Access:** Road. **Prop:** Large group of claims. **Owner:** Mr. Larsen. **Ore:** Zinc, lead, copper, silver, gold. **Ore min:** Sphalerite, galena, chalcopyrite. **Deposit:** Mineralized fractures in limestone and diorite. Mineralization very sparse. **Dev:** 5 short adits. **Assays:** As high as 60% Pb, 3% Zn, 25 oz. Ag are reported. Obviously these assays were on handpicked samples. **Ref:** 104, 5/30/33, p. 18; 10/15/33, p. 18; 2/28/37, p. 28. 158.

Yankee Boy (11)

(see under copper)

STEVENS COUNTY**A and C (83)**

(see under copper)

Abe Lincoln

(see Comstock under lead)

Acme (100)

(see under lead)

Admiral Consolidated (51)

Loc: Center W $\frac{1}{2}$ sec. 36, (40-41E), Northport dist. **Elev:** 2,400 ft. **Access:** $1\frac{1}{2}$ mi. N. of Leadpoint by road. 8 mi. from railroad at Boundary. **Prop:** Group of claims. **Owner:** Admiral Consolidated Mining Co., Spokane, Wash. (1947—). **Ore:** Zinc, lead, silver, cadmium. **Ore min:** Sphalerite, galena. **Gangue:** Dolomite. **Deposit:** 5- to 10-ft. zone of stringers and disseminated sphalerite in dolomite. **Improv:** 75-ton flotation mill (1955). **Assays:** One sample showed 2.8% Pb, 3.1% Zn. 5 cars of ore shipped in 1948 had 38% to 43% Zn. **Prod:** 1947-1952, 1954. 1,441 tons from 1947 through 1949. 1950 (406,166 lb. Zn, 10,866 lb. Pb, 135 oz. Ag). 1951 (15,000 tons of ore yielded 308,750 lb. Zn, 8,500 lb. Pb, 125 oz. Ag). **Ref:** 46, p. 99. 97, 1947-1951. 110, April-May 1948, p. 2. 133, p. 29. 157. 158.

Advance (40)

Loc: NE $\frac{1}{4}$ sec. 18, (39-41E), Northport dist. **Elev:** 4,000 ft. **Access:** Road. **Prop:** 28 unpatented claims and 840 acres of deeded land. **Owner:** Mines Management, Inc., Spokane, Wash. (1949—). **Ore:** Zinc, lead, silver, gold. **Ore min:** Sphalerite, galena. **Gangue:** Silicified limestone. **Deposit:** Low-dipping mineralized zone in limestone with interbedded slate exposed underground av. 10 ft. wide and is 200 ft. long. Surface trenching shows length of 4,000 ft. **Owner** reported 50,000 tons of indicated ore in 1952. **Dev:** About 750 ft. of workings in 3 adits, a shaft, and a winze prior to 1948. 1,100 ft. of drifts and cross-cuts and 771 ft. of raises added in 1948-1949. **Improv:** Compressor, mining machinery, 50-ton mill, 200-ton ore bin (1952). **Assays:** Ore contains traces of gallium and germanium. **Ref:** 30, p. 90. 133, p. 37. 158.

Aichan Bee (126)

(see under silver)

Aladdin (Blue Ridge, Sierra Zinc)

(see Sierra Zinc)

Aladdin (92)

(see under lead)

Alma (101)

(see under silver)

Anaconda (56)

(see under lead)

A. Anderson (50)

Loc: NE $\frac{1}{4}$ sec. 3, (39-41E), Northport dist. **Owner:** Grandview Mines, Inc., Spokane, Wash. (1953—). **Ore:** Zinc, lead, nickel. **Ore min:** Sphalerite, galena. **Deposit:** Replacement deposit in limestone near black slate contact. Also a narrow vein of 4% Ni. **Dev:** Trenches, diamond drill holes. **Ref:** 158.

Anderson (49)

Loc: NW $\frac{1}{4}$ sec. 2, (39-41E), on W. side of Deep Cr., $\frac{1}{2}$ mi. W. of Leadpoint. **Elev:** 2,200 ft. **Access:** 17 mi. by graveled road from railroad at Northport. **Prop:** Mineral rights on deeded land. **Owner:** Goldfield Consolidated Mines Co., San Francisco, Calif. (1948—). **Ore:** Zinc, lead. **Ore min:** Sphalerite, galena, pyrite. **Gangue:** Silicified dolomitic limestone. **Deposit:** Disseminations in limestone. **Dev:** Production is from open pit. **Assays:** Ore mined and milled av. 2.4% Zn, 0.5% Pb. **Ore reserve:** Reported by operator to be 500,000 tons (1952). **Prod:** 1948-1952. About 100,000 tons to end of 1951. **Ref:** 30, p. 97. 89. 133, p. 34.

Ark (99)

(see under silver)

Austin

(see Aichan Bee under silver)

Avondale-Dome (77)

(see under lead)

Banner

(see Chinto under copper)

Bear Mountain (104)

(see under lead)

Big Chief (79)

(see under lead)

Black Canyon

(see under lead)

Black Horse

(see Columbia Tungsten under tungsten)

Black Rock (Washington Black Rock, Gorien Zinc) (35)

Loc: Sec. 24, (39-40E), on E. side of Deep Cr. just N. of the Last Chance mine. **Elev:** 2,000 ft. **Access:** 6 mi. by road to railroad at Northport. **Prop:** 7 claims and 7 acres of deeded land. **Owner:** Last Chance Consolidated Mines, Inc., Spokane, Wash. (1952—). Gust Maki (1920). John Gorien (1921). Washington Black Rock Mining Co. (1922-1932). Black Rock Mining Co. (1936). Knob Hill Mines, Inc. (Willow Creek Mines, Inc.) (1943). **Ore:** Zinc, lead. **Ore min:** Sphalerite, smithsonite, galena. **Gangue:** Dolomite. **Deposit:** Disseminated ore in white unsilicified dolomitic marble along bedding planes. Two ore bodies shown by drilling appear to have moderate ore reserves with av. grade of 8% Zn. **Dev:** 250-ft. incline, 260-ft. adit, considerable drifting and stoping on the 200- and 250-ft. levels, diamond drill and churn drill holes. **Assays:** 6 carloads av. 40% Zn. Ore contains traces of gallium and germanium. **Prod:** 6 carloads of ore prior to 1920, 5,280 tons in 1922-1924, \$300,000 prior to 1930. Produced in 1943. **Ref:** 30, pp. 92-93. 46, pp. 82-84. 73, pp. 107-109. 97, 1923-1926, 1928. 98, 1922-1926. 106, 6/1/25, p. 7; 11/1/29, p. 25; 6/2/32. 113, 8/20/36, p. 6. 129, pp. 111-112. 130, p. 91. 133, p. 36. 141, pp. 21, 22, 46. 157. 158.

Black Witch

(see Alma under silver)

Bliss

(see Galena Hill under lead)

Blue Ridge

(see Sierra Zinc)

Blue Star

(see Eagle under silver)

Bonanza (72)

(see under lead)

Boundary Silver Lead

(see Lucile)

Brooks (123)

(see under silver)

Bruce Creek

(see A and C under copper)

Buffalo (68)

(see under silver)

Bullion (24)

(see under lead)

Burrus (Rocky Creek) (91)

Loc: Sec. 8, (37-41E), on Rocky Cr., Northport dist. **Elev:** 2,400 ft. **Access:** 1 mi. SE. of Aladdin by road. **Prop:** 8 patented claims. **Owner:** J. W. Burrus, Colville, Wash. (1947). **Ore:** Lead, silver, zinc, copper, gold. **Ore min:** Chalcopyrite, galena, sphalerite. **Gangue:** Quartz. **Deposit:** Mineralized zone with max. width of 60 ft. consists of small quartz veins in argillite. **Dev:** 80-ft. shaft and several short adits total 300 ft. of underground workings. **Assays:** Ore said to av. \$20 per ton in all values. **Prod:** 1938, 1939. **Ref:** 30, pp. 91-92. 46, p. 60. 52, p. 7. 97, 1939, p. 49; 1940, p. 480. 104, 8/15/34, p. 22; 11/30/35, p. 26; 3/15/38. 106, 11/3/32, p. 14; 7/34. 158.

Carbo (45)

Loc: E. edge of sec. 25, (39-41E), 1½ mi. E. of Deep Lk., Northport dist. **Access:** Trail from a point 2 mi. up the logging road which follows Currant Cr. **Prop:** Private land. **Owner:** Leased by John Colby, Northport, Wash., from North Columbia Lumber Co., Deer Park, Wash. (1942). **Ore:** Zinc. **Ore min:** Smithsonite. **Gangue:** Dolomite. **Deposit:** Ore is an aggregate of cavernous lenses of smithsonite-rich dolomite elongated parallel to bedding of low-dipping beds in lower Metaline

limestone. Ore zone is cut off by major fault 100 to 250 ft. down dip from outcrop. May be ore in breccia zone along fault. **Dev:** None (1944). **Assays:** Aggregate of exposed ore lenses and interbedded waste est. to av. 3% Zn for thickness of 15 ft. and strike length of 300 ft. A 12-ft.-thick lens showed 20.5% Zn. **Ref:** 20.

Chewelah Eagle

(see Eagle under silver)

Chinto (106)

(see under copper)

Chloride Queen (78)

(see under lead)

Cholett

Loc: Sec. 1, (37-39E), 5 mi. W. of Van Stone mine. **Elev:** 3,000-4,000 ft. **Owner:** American Smelting & Refining Co., Wallace, Idaho (1951—). **Ore:** Zinc, lead. **Ore min:** Sphalerite, pyrite. **Deposit:** Gossan and primary sulfides disseminated in Metaline limestone near intrusive contact with granodiorite. **Dev:** 7 bulldozer trenches, diamond drill holes. **Assays:** 5-ft. gossan assayed 7.9% Zn, and for 65 ft. the zone av. 2.2% Zn. **Ref:** 1-C, vol. 7, no. 10, pp. 937-940.

Cleveland (118)

(see under lead)

Clugston

(see Silver Trail under lead)

Columbia

(see Iroquois)

Columbia Tungsten (115)

(see under tungsten)

Colville Queen

(see Chloride Queen under lead)

Comstock (Abe Lincoln) (12)

(see under lead)

Contention

(see Mountain View under silver)

Copper King (55)

(see under lead)

Copper King (86)

(see under lead)

Coyote (19)

(see under lead)

Coyotte

(see Coyote under lead)

Daisy

(see Daisy-Tempest under silver)

Daisy-Tempest (102)

(see under silver)

Dead Medicine

(see Silver Trail under lead)

Deep Creek (Gorien Zinc, Northport) (38)

Loc: Secs. 23 and 24, (39-40E), about 100 yd. from the W. bank of Deep Cr. **Elev:** 1,900 ft. **Access:** 6 mi. by road to railroad at Northport. **Prop:** Several claims. **Owner:** The Goldfield Consolidated Mines Co., San Francisco, Calif. (1944—). Northport Mining Co. (1919-1921). Knob Hill Mines, Inc. (1943). Jamieson-Higginbotham (1944-1947). **Ore:** Zinc, lead, silver. **Ore min:** Sphalerite, galena, pyrite. **Gangue:** Dolomite and limestone. **Deposit:** Ore is in highly banded and contorted zone 50 to 100 ft. thick and 200 to 300 ft. long in dolomite. Lead

values are highest to the south. **Dev:** Incline shaft 850 ft. deep, workings on 8 levels. **Assays:** 1949 production reported to av. 4.25% combined Pb and Zn. One vein assayed 25% Pb, 6.8 oz. **Ag. Prod:** 1944-1952 (350,000 tons), 1953-1955. **Ref:** 30, p. 111. 46, pp. 80-81. 97, 1950, p. 1613; 1951, p. 1616. 108, 3/54, pp. 279-281. 129, pp. 107-110. 130, p. 91. 133, p. 34.

Deep Lake

(see Farmer)

Deer Trail (121)

(see under silver)

Defender (7)

Loc: N½ sec. 25, (39-36E), on W. slope of Toulou Mtn., Orient dist. **Elev:** 1,900 to 2,400 ft. **Access:** 1½ mi. SE. of Orient by road and trail. **Prop:** 11 claims and a fraction, 2 patented. **Owner:** Estate litigation (1941). Defender Mining Co. (1909-1914). **Ore:** Zinc, copper, gold, silver. **Ore min:** Sphalerite, pyrite, pyrrhotite, chalcopyrite, galena, free gold. **Gangue:** Calcite, quartz, siderite. **Deposit:** 150-ft. zone near a fault in monzonite and amphibolite contains many viens. One is 18 in. wide. **Dev:** Small open cuts and shallow shafts on each claim and a 106-ft. inclined shaft on the Denver claim. **Assays:** A 60-ft. intrusive dike said to assay \$3 to \$4 Au. **Ref:** 7, pp. 80-81. 30, pp. 119-120. 46, pp. 103-104. 114, no. 5, 1909, pp. 61-62. 164, pp. 269-270.

Dora

(see Acme under lead)

Double Standard (14)

(see under copper)

Eagle (108)

(see under silver)

Easter Sunday (9)

(see under gold)

Easy Money

(see Magma)

Echo (80)

Loc: Sec. 14, (37-39E), adjacent to the Big Chief mine, Northport dist. **Prop:** 7 claims. **Owner:** Echo Mining Co. (1941). **Ore:** Zinc, lead, silver. **Ore min:** Mixed sulfides. **Deposit:** Presumably similar to the Big Chief deposit. **Dev:** 2 adits reportedly total 850 ft. of underground workings. **Ref:** 46, p. 51. 158.

Eldorado

(see Magma)

Electric Point (46)

(see under lead)

Emerald

(see under lead)

Empire (36)

Loc: Sec. 24, (39-40E), 5 mi. from Northport. **Ore:** Zinc, lead. **Ref:** 158.

Eureka (2)

(see under gold)

Eureka (Uncle Sam)

(see Uncle Sam under lead)

Eureka and Orient

(see Eureka under gold)

Evergreen (69)

(see under lead)

Farmer (Deep Lake) (42)

Loc: Sec. 34, (39-41E), at S. end of Deep Lk. **Elev:** 2,050 to 2,425 ft. **Access:** 12 mi. by road to railroad at Northport. **Prop:** 2 claims: King Tut No. 1, King Tut No. 2. **Owner:** John and Tom Farmer, Spokane, Wash. (1944—), leasing to C. W. and N. C. Hartbauer, Northport, Wash. (1950-1952). **Ore:** Zinc, lead, silver. **Ore min:** Sphalerite, galena, pyrrhotite, pyrite. **Gangue:** Dolomite, calcite. **Deposit:** Replaced and mineralized fracture zone in limestone is 2 to 20 ft. wide and has been traced for 600 ft. on the surface near granite contact. **Dev:** 135-ft. adit, a smaller adit, 150 ft. of shaft work, an open pit, 2 diamond drill holes. **Assays:** One diamond drill hole showed a 20-ft. intersection av. 5% Zn. General grade reported to be 2.5% Pb, Zn. Ore contains traces of gallium and germanium. **Prod:** Small amounts 1937, 1947-1951. **Ref:** 30, p. 102. 97, 1938, p. 460. 133, p. 33. 136. 158.

Flannigan

(see Iroquois)

Flat Creek (11)

Loc: Sec. 4, (39-38E), on Flat Cr. **Elev:** 2,830 ft. **Access:** 19 mi. by road to railroad at Northport. **Prop:** 3 unpatented claims. **Owner:** Claude Sanders, Northport, Wash., leasing from Otto Ehrendreich, Northport, Wash. (1939-1950). **Ore:** Zinc, lead. **Ore min:** Sphalerite, galena. **Deposit:** Narrow veins and related small replacement bodies in impure quartzite along fractures. Ore minerals are bunched and sparse as exposed in 1950. **Dev:** 8-ft. pit, several trenches. **Ref:** 157.

Frisco Standard (67)

(see under silver)

Galena Hill (6)

(see under lead)

Gillete

(see Avondale-Dome under lead)

Gladstone (47)

(see under lead)

Globe (8)

(see under copper)

Gold Bar (73)

(see under gold)

Gorien Zinc

(see Black Rock, Deep Creek, New England)

Note: In 1919 John Gorien was Treasurer of the Northport Mining Co., and this company owned or controlled 280 acres of mineral land on both sides of Deep Cr. Valley, probably including all of the properties described separately in this report under the names of Deep Creek (Northport, Gorien), New England (Stone), Black Rock (Washington Black Rock, Gorien Zinc), and probably including others also.

Great Republic (15)

(see under copper)

Great Western (33)

(see under lead)

Grubstake

(see under silver)

H & B

(see Aichan Bee under silver)

Hartbauer (54)

(see under lead)

Hartford

(see Krug under copper)

Hecla (109)

(see under copper)

Helena Johnson (37)

(see under lead)

Heritage (25)

Loc: Near center sec. 9, (39-39E), Northport dist. **Owner:** Wm. Heritage (1952). **Ore:** Zinc, tungsten. **Ore min:** Sphalerite, scheelite. **Deposit:** Sphalerite sparsely scattered in limestone. **Dev:** Open cuts, shaft. **Ref:** 158.

Hi Cliff

(see Uncle Sam under lead)

Highland (63)

(see under lead)

Hoodoo (122)

(see under silver)

Hubbard (23)

(see under lead)

Hunter

(see Jackson)

Indian

(see Eureka under gold)

Iron Mask (Treadwell) (3)

Loc: Sec. 25, (40-36E), just E. of the Mystery property. **Access:** Road. **Prop:** 2 unpatented claims. **Owner:** Andrew Abrahamson and Joe Bobbout, Orient, Wash. (1941). **Ore:** Zinc, lead, silver, gold, copper. **Ore min:** Pyrite, pyrrhotite, chalcopryrite. **Deposit:** Quartz vein said to av. 4 to 6 ft. in width and to be traceable for 3,000 ft. occurs in latite and limestone cut by granite dike. **Dev:** 100 ft. of work in 3 shafts, some open cuts. **Assays:** A selected sample assayed 28% Zn, 14% Pb, 7 oz. Ag. 0.08 oz. Au. **Ref:** 30, pp. 127-128. 164, p. 282.

Iroquois (Flannigan, Columbia) (57)

Loc: Secs. 19, 20, 29, and 30, (40-42E), just E. of Red Top Mtn., Northport dist. **Elev:** 2,600 ft. **Access:** 4 mi. road to Leadpoint. 12 mi. to railroad at Boundary. **Prop:** 17 unpatented claims and 40 acres deeded land. **Owner:** Mines Management, Inc., Spokane, Wash. (1948—). Iroquois Mining Co. (1918-1924). Willow Creek Mines, Inc. (1945). **Ore:** Zinc, lead, silver, gold. **Ore min:** Galena, sphalerite, pyrite, chalcopryrite, cerussite, smithsonite. **Deposit:** Ore occurs as replacements in a breccia zone 50 to 60 ft. wide in limestone 280 ft. from contact with argillite. Altered lamprophyre dikes are associated with the ore. **Dev:** 800-ft. crosscut, 5,089 ft. of diamond drill holes, several old workings, and a large glory hole. 1,900 ft. of drifts and a 351-ft. raise. **Improv:** New 20- by 48-ft. metal building (1949). **Assays:** Owner reported 640,000 tons of indicated ore in 1950 had an indicated av. of 3.02% Zn, 0.88% Pb. **Prod:** 1917, 1928. 2,898 tons in 1950 av. 3.3% Zn, 0.39% Pb, 0.1 lb. Cd, 0.025 oz. Ag per ton. **Ref:** 30, p. 108. 46, pp. 85-86. 73, pp. 102-104. 97, 1917, p. 506; 1928, p. 703. 98, 1920-1925. 108, 4/50. 110, 1/49, pp. 5-6. 112, p. 185. 133, p. 37. 158. 164, pp. 296-297.

Jackson (Hunter) (60)

Loc: SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 19, (40-42E), on W. side of Red Top Mtn., Northport dist. **Access:** 2 mi. from road. **Prop:** 1 unpatented claim. **Owner:** W. F. Stevens (1941). White City Silver Mines Co. (1928-1935). **Ore:** Zinc, silver, lead, copper. **Ore min:** Pyrite, chalcopryrite, sphalerite, galena. **Deposit:** Mineralized quartz vein in argillite 4 to 6 ft. in width. **Dev:** 350-ft. adit with 100-ft. raise, 3 upper adits, each about 175 ft. long. **Prod:** 1928, 1935. **Ref:** 30, p. 108. 97, 1928, p. 703; 1935, p. 355. 106, 9/17/28, p. 24. 158.

Jay Dee (107)

(see under silver)

Jay Gould (110)

(see under silver)

Joe Creek (95)

Loc: NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 4 and SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 5, (36-40E), Mill Cr. area. **Owner:** Joe Creek Mining Co., Colville, Wash. (1952—). **Ore:** Zinc, lead. **Ref:** 133, p. 35.

Jupiter

(see Last Chance under lead)

Just Time (62)

(see under lead)

Keough (64)

(see under lead)

Kettle River

(see Galena Hill under lead)

King Tut

(see under lead)

Krug (113)

(see under copper)

Lakeview

(see Roosevelt under silver)

Last Chance (34)

(see under lead)

Lead King (48)

(see under lead)

Little Frank (120)

(see under lead)

Lone Star (20)

(see under silver)

Longshot (94)

(see under lead)

Lucile (Owen, Boundary Silver Lead) (58)

Loc: Near center S. line SW $\frac{1}{4}$ sec. 19, (40-42E), on Red Top Mtn., Northport dist. **Elev:** 3,550 ft. **Access:** 9 mi. by road to railroad at Boundary. **Prop:** 7 claims: Tip Top, Winner, Cabin, Lucile, Comet, Silver Tip, Effie. **Owner:** 20-yr. lease (1952-1972) by Pacific Northwest Mining Co., Bremerton, Wash., from Consolidated Speculator Corp., Spokane, Wash. (1948—). E. C. Owen (1910-1943). Leased to Boundary Silver Lead Co. (1926). **Ore:** Zinc, lead, silver, cadmium. **Ore min:** Galena, tetrahedrite, sphalerite, pyrite, scheelite, cerussite. **Gangue:** Quartz, calcite. **Deposit:** Irregular mineralized zones in marble associated with quartz veins and lamprophyre dikes. Ore body developed in 1948, 8 to 25 ft. wide est. to contain 11,000 tons of ore. The best showing of scheelite is in quartz stringers associated with the sulfides in a zone exposed for 50 ft. in a short drift at end of the 212-ft. adit. **Dev:** 212-ft. adit, from which several winzes and drifts have been driven. Another adit 75 ft. lower is 430 ft. long (1953). **Improv:** New ore bins, compressor house, cabin (1949). **Assays:** Zn concentrates reportedly high enough in Cd to pay freight and smelter charges. Weighted av. of 12 samples 1.5 to 8.0 ft. wide was 2.34% Pb, 8.7% Zn, 1.36 oz. Ag. 50 tons produced in 1926 contained 11% Zn, 19% to 32% Pb. Ore contains a trace of gallium. **Prod:** 50 tons 1926, 160 tons 1948, 44 tons 1949. **Ref:** 30, pp. 89-90. 37, pp. 61-62. 46, pp. 66-68. 73, pp. 100-102. 97, 1928, p. 703. 106, 9/17/28, p. 24. 110, 2/49, p. 3. 150, p. 30. 157. 158. 164, pp. 298-299.

Lucky Charlie (5)

(see under copper)

Lucky Stone (76)
(see under lead)

Magma (Easy Money, Eldorado) (88)

Loc: E½SW¼ sec. 28, (38-41E), Northport dist. **Elev:** 3,200 ft. **Access:** Poor truck road from highway along S. Fk. Deep Cr. 14 mi. from railroad at Ione. **Prop:** 25 unpatented claims. **Owner:** Otto Berglund (Magma Molybdenum Mines Co.), Colville, Wash. (1921-1943). Magma Mines & Metals Co. (1930). **Ore:** Zinc, lead, molybdenum, tungsten, copper, silver, gold. **Ore min:** Sphalerite, galena, pyrite, molybdenite, scheelite. **Gangue:** Garnet, epidote, calcite. **Deposit:** Contact-metamorphic replacement of limestone near its contact with granite. **Dev:** 610-ft. adit, 110-ft. shaft, and other workings total 1,800 ft. **Assays:** 5 tons handpicked galena av. 62% Pb. A composite of three 18-in. channel samples showed 0.3% Pb, 1.0% Zn, 0.11% WO₃, 0.22% Mo. **Prod:** 5 tons galena ore 1927. **Ref:** 30, p. 109. 37, p. 63. 46, p. 61. 97, 1930, p. 676. 104, 1/15/35, p. 25. 106, 11/3/32, p. 9. 157. 158.

Maki (44)
(see under lead)

Maple Leaf
(see Melrose under silver)

Melrose (52)
(see under silver)

Mexico
(see Queen under silver)

Michigan Boy (96)
(see under lead)

Middleport (Rinchaw) (93)
Loc: SE¼ sec. 12, (36-41E), Colville dist. **Elev:** 4,500 ft. **Access:** 3 mi. of dirt road to State Highway 6-A at Middleport. **Prop:** 2 patented and 6 unpatented claims. **Owner:** Ed Fisher, Addy, Wash. (1941). E. F. Hauck, lessee. A. G. Fisher, Anastasia Fisher, P. H. Daly, Daisy C. Lorenz (1920). **Ore:** Zinc, lead, copper, silver, gold. **Ore min:** Sphalerite, galena, tetrahedrite, chalcopyrite, pyrite. **Gangue:** Quartz, dolomite, chlorite. **Deposit:** Mineralized quartz vein in granite av. 6 to 24 in. wide. Vein said to have a length of 6,000 ft. **Dev:** 800-ft. lower adit, 60-ft. upper adit, 60-ft. winze from lower adit. The two levels are 100 ft. apart. **Assays:** Ore said to run 8% Pb, 8% to 32% Zn, 11.80 oz. Ag, 0.13 oz. Au. **Prod:** 1929, 1937-1939. 50 tons mined and 35 tons milled in 1939. **Ref:** 30, p. 51. 46, pp. 112-113. 97, 1929, 1938-1940. 158.

Mineral Hill
(see Aichan Bee under silver)

Moonlite
(see Morning under silver)

Morning (89)
(see under silver)

Mountain View (21)
(see under silver)

Mullen (112)
(see under lead)

Myeerah (66)
(see under lead)

Neglected (81)
(see under lead)

Nevada (114)
(see under lead)

New England (Stone) (31)

Loc: Sec. 26, (39-40E), on W. side of Deep Cr., adjoining Northport property. **Elev:** 1,900 ft. **Access:** 6 mi. by road from railroad at Northport. **Prop:** 5 unpatented claims. **Owner:** Knob Hill Mines, Inc. (1943). Northport Mining Co. (1919). Ben Stout and L. W. Cook (1921). Wm. Siegman and associates, lessees (1938). **Ore:** Zinc, lead. Cobalt has been reported also. **Ore min:** Sphalerite, galena. **Gangue:** Tremolite. **Deposit:** Ore occurs as a replacement in limestone along lines of bedding near its contact with granite. Mineralized zone is 40 ft. wide with strongest mineralization over 24-ft. width. **Dev:** 350-ft. adit, 2 open pits. **Assays:** A few hundred tons of ore exposed are est. to run 3% Zn. Ore contains traces of gallium and germanium. **Ref:** 22, p. 7. 30, p. 100. 46, pp. 78-79. 73, p. 106. 111, p. 10. 129, pp. 110-111. 158. 164, pp. 312-313.

Newland
(see Longshot under lead)

North Monitor (119)
(see under silver)

Northern Light (28)
(see under lead)

Northport
(see Deep Creek)

Northwest
Loc: Northport dist. **Owner:** Daroy Metals Co. (1945). **Ore:** Zinc. **Prod:** Several hundred tons of zinc carbonate in 1920, and 45 tons of ore in 1945. **Ref:** 97, 1920, p. 269; 1945, p. 488.

Oakshott (90)
(see under lead)

Occidental (32)
Loc: Sec. 26, (39-40E), Northport dist. **Access:** ½ mi. from road. **Prop:** 4 unpatented claims and 1 fraction. **Owner:** Archie Robertson, Northport, Wash. (1941). **Ore:** Zinc, lead. **Ore min:** Galena, sphalerite. **Deposit:** A 30-in. silicified fault zone has disseminated sphalerite exposed in shaft. Reportedly a contact zone between granite and limestone about 4 ft. wide and traceable for 3,000 ft. **Dev:** 450-ft. drift, 200-ft. drift, 75-ft. shaft, 25-ft. shaft, and considerable surface stripping. **Ref:** 30, p. 105. 158.

Old Dominion (98)
(see under silver)

O-Lo-Lim (128)
(see under copper)

Olympia (70)
(see under lead)

Orazada (127)
(see under silver)

Orchid (117)
(see under silver)

Orient Eureka
(see Eureka under gold)

Owen
(see Lucile)

Paragon
(see Melrose under silver)

Payne (111)
(see under copper)

Perry (1)
(see under lead)

Pioneer

(see Longshot under lead)

Plug (41)

Loc: Secs. 28 and 33, (39-41E), just W. of Farmer property. **Access:** 14 mi. by road from railroad at Northport. **Prop:** 160 acres of deeded land. **Owner:** Grandview Mines, Inc., Spokane, Wash. (1952—). Mrs. Helen Johnson, Northport, Wash. (1941-1945). **Ore:** Zinc, lead, silver. **Deposit:** Replacement zone in limestone near granite contact is about 12 ft. wide and has been traced on the surface for 1,000 ft. **Dev:** 15-ft. shaft, 130-ft. adit. **Assays:** Said to contain as much as 22% Zn, 2% Pb. Samples from unspecified widths show 0.1% to 0.2% Pb, 0.3% to 8.9% Zn. **Ref:** 30, p. 90. 46, p. 62. 157. 158.

Pomeroy (10)

Loc: SE¼ sec. 22, (40-37E), 1,500 ft. S. of Easter Sunday property, Orient dist. **Elev:** 3,550 ft. **Access:** 8 mi. E. of Rockcut on Easter Sunday Lk. Road. **Prop:** 2 unpatented claims: Copper Mask, Copper Glance. **Owner:** W. M. Hendrickson, Orient, Wash. (1949). Sulphide Mountain Mining & Milling Co. (1907-1918). R. Normberg, Orient, Wash. (1941). **Ore:** Zinc, lead, copper, antimony, silver, gold. **Ore min:** Mostly sphalerite, some pyrite, galena, chalcopryrite, boulangerite, bornite. **Deposit:** Quartz vein as much as 8 ft. wide in schistose diabase or related rock. **Dev:** Vertical shaft 220 ft. deep, 27-ft. shaft. **Assays:** Said to carry Ag. **Ref:** 7, p. 83. 30, p. 127. 33, 1907, p. 1056; 1908, p. 1279. 98, 1918, p. 137. 132, pp. 143-144. 164, pp. 278-279.

Providence (22)

(see under lead)

Providence (Deer Trail)

(see Deer Trail under silver)

Queen (124)

(see under silver)

Queen and Seal

(see Queen under silver)

Ranch View (59)

(see under lead)

Red Sheaf (75)

(see under gold)

Red Top (53)

(see under lead)

Redwood

(see Eagle under silver)

Rinchaw

(see Middleport)

Riverview (16)

(see under lead)

Robena

(see Young America)

Rockcut (4)

(see under lead)

Rocky Creek

(see Burrus)

Roosevelt (61)

(see under silver)

Royal

(see Big Chief under lead)

Royal Gold

(see Hubbard under lead)

Santa Rita

(see Cleveland under lead)

Saturday Night-Sunday Morning (125)

(see under lead)

Scandia (39)

Loc: NE¼ sec. 23, (39-40E), on W. side of Deep Cr. **Elev:** 2,469 ft., 600 ft. above Deep Cr. **Access:** 6 mi. by road from railroad at Northport. **Prop:** 5 claims: Scandia, Galena, Queen, Sunnyside, Triangle; and 70 acres of deeded land. **Owner:** John, Donald, Theodore, and Effie Nasburg and Raleigh Hallenius, Spokane, Wash. (1943—). **Ore:** Zinc, lead, silver, gold. **Ore min:** Sphalerite, a little galena. **Gangue:** Calcite. **Deposit:** Mineralized breccia zone in dolomite near slate contact. Evidence of mineralization over lateral distance of about 400 ft. **Dev:** 20-ft. shaft, 240-ft. drift, 100-ft. winze (1953). **Assays:** Several samples show from 5.74% to 39.19% Zn, 3.3% to 15.0% Pb, 0.6 to 1.0 oz. Ag, tr. Au. Ore in 100-ft winze runs 2% to 22% Zn (1953). One carload of ore in 1950 contained 8% Pb, 8.6% Zn. **Prod:** 1950, 1951. **Ref:** 133, p. 38. 157. 158.

Seal

(see Queen under silver)

Shoemaker (97)

Loc: SE¼ sec. 8, (36-40E), NE. of Colville. **Access:** About 10 mi. by road from railroad at Colville. **Prop:** 6 unpatented claims. **Owner:** Daroy Metals, Inc. (1944—). **Ore:** Zinc, silver. **Ore min:** Sphalerite, galena, pyrite. **Deposit:** 6-ft. mineralized zone underlying low-dipping thrust fault in brecciated dolomite. Ore minerals show only in the upper adit. **Dev:** 1,200 ft. of workings in 2 adits, 3 raises, 3 stopes, and numerous open cuts. **Assays:** 81 tons av. \$14 per ton. Ore remaining in sight in 1953 est. to av. 4% sphalerite. **Prod:** 1926; 81 tons shipped to Wallace, Idaho in 1941. **Ref:** 30, p. 52. 46, p. 48. 68, p. 8. 97, 1926, p. 469. 157. 158.

Short Wait (26)

(see under lead)

Sierra Zinc (Aladdin, Blue Ridge) (87)

Loc: Secs. 19, 20, 29, and 30, (38-41E), on W. side of Deep Cr. 4 mi. N. of Aladdin. **Elev:** 2,000 ft. **Access:** ½ mi. W. of the Aladdin-Deep Lk. highway by road. 17 mi. from railroad at Northport. **Prop:** 7 claims: Troublesome, Mistake, In Place, Original (or Skookum), Rite, Champion, Protect. **Owner:** Goldfield Consolidated Mines Co., San Francisco, Calif. (1949—). Aladdin Mining Co. (1908-1933). Blue Ridge Mining Co. (1910-1940). Sierra Zinc Co. (1940-1944). **Ore:** Zinc, lead, silver, gold. **Ore min:** Sphalerite, galena, chalcopryrite, pyrite, molybdenite, smithsonite. **Gangue:** Dolomite, limestone. **Deposit:** Present ore consists of sphalerite and galena disseminated in limestone. Also on the property are quartz veins which carry minor amounts of chalcopryrite, sphalerite, galena, pyrite, and molybdenite. The main ore body mined prior to 1944 measured 300 ft. along the strike, 200 ft. down dip, and 4 to 12 ft. thick. 3 smaller ore bodies were mined. The ore occurred in marble close to a low-dipping fault and/or an igneous sill. **Dev:** 6 adits total 8,450 ft. of workings and 470 ft. of shaft. Diamond drill holes. Principal workings are on 4 levels. The upper 2 levels are connected to the lower 2 by a 260-ft. 30° inclined shaft. **Improv:** 300-ton flotation mill (1954). **Assays:** A carload of conc. ran 6.7 oz. Ag, 0.14 oz. Au, 21.9% Zn, 11% Pb. 12,123 tons produced in 1942 av. 1.59% Pb, 7.36% Zn. Av. of 0.67% Pb, 5.43% Zn, 0.491 oz. Ag, 0.012 oz. Au per ton were recovered from 1941-1944 production. **Prod:** 1909, 1924, 1925, 1941-1944 (100,000 tons), 1950-1952. **Ref:** 30, pp. 109-110. 46, pp. 40-42. 63, p. 111. 73, pp. 109-111. 97, 1925, p. 561; 1926, p. 470. 98, 1922-1926. 106, 1/5/33. 108, 1/42,

p. 40; 3/43, pp. 23-25. 112, p. 164. 116, no. 2, 1908, p. 26. 133, p. 34. 158.

Silver Basin

(see Queen under silver)

Silver Crown (29)

(see under lead)

Silver Key

(see Big Chief under lead)

Silver Mountain

(see Daisy-Tempest under silver)

Silver Queen (Ark)

(see Ark under silver)

Silver Queen (Queen)

(see Queen under silver)

Silver Seal

(see Queen under silver)

Silver Trail (84)

(see under lead)

Smoky Bullion

(see A and C under copper)

Star

(see Just Time under lead)

Sterrett (18)

(see under lead)

Stockwell

(see Columbia Tungsten under tungsten)

Stone

(see New England)

Stonewall-Sunnyside (30)

(see under lead)

Sugar Loaf

(see Vanasse under silver)

Sunday Morning

(see Saturday Night-Sunday Morning under lead)

Sunnyside

(see Stonewall-Sunnyside under lead)

Sunset (17)

(see under lead)

Surprise

(see Uncle Sam under lead)

Tempest (103)

(see under silver)

Tenderfoot (Avondale-Dome)

(see Avondale-Dome under lead)

Tenderfoot (Big Chief)

(see Big Chief under lead)

Treadwell

(see Iron Mask)

Uncle Sam (82)

(see under lead)

United Treasure (65)

(see under silver)

Van Stone (85)

Loc: Pit: E½ sec. 33, (38-40E). Mill: SE¼ sec. 28, (38-40E), on headwaters of Onion Cr. **Elev:** 3,600 ft. at mill. **Access:** 11 mi. by road to railroad at Marble. **Prop:** 16 unpatented claims,

deeded land. **Owner:** American Smelting & Refining Co., Salt Lake City, Utah (1950—). Geo. Van Stone and Harry Maylor (1920-1926). Hecla Mining Co. (1926-1927). Van Stone Mining Co. (1930). Willow Creek Mines of Nevada, Inc. (1939-1950). **Ore:** Zinc, lead. **Ore min:** Sphalerite, galena, pyrrhotite, pyrite. **Gangue:** Jasperoid, tremolite. **Deposit:** Bedding replacement of dolomite in Metaline limestone well below top of the formation. Two ore bodies have been developed by diamond drilling, one of which is exposed in an open pit. The pit will ultimately be about 1,400 ft. long and 400 ft. wide. The S. ore body is one-fourth as large. The ore bodies are 400 to 1,600 ft. from granite contact. Mineralized zones are lensy. **Dev:** 40-ft. shaft, 200-ft. adit, 600-ft. adit, diamond drill holes. Production is from open pit. **Improv:** Camp buildings, 1,000-ton mill, and accessory buildings (1955). **Assays:** A shipment after removal of some zinc by hand-sorting gave 42% Pb, 8% Zn, 4.2 oz. Ag, 0.005 oz. Au. Comparatively large tonnage of ore indicated by drilling av. 1.15% Pb, 5.54% Zn. Mining ore expected to av. 4.0% combined Pb, Zn. **Prod:** 1930, 1937, 1942, 1952-1955. **Ref:** 30, pp. 110-111. 43, 4/53, pp. 72-76. 46, p. 65. 97, 1930, p. 676; 1938, p. 460; 1943. 106, 3/5/31, p. 19. 108, 4/53, pp. 26-31, 68-69. 133, p. 29. 158.

Vanasse (74)

(see under silver)

Venus

(see Deer Trail under silver)

Victory

(see Vanasse under silver)

Wall Street (27)

(see under copper)

Washington Black Rock

(see Black Rock)

Wells Fargo (116)

(see under antimony)

White Horse (13)

(see under copper)

Winslow (105)

(see under lead)

Young (43)

(see under lead)

Young America (Robena) (71)

Loc: SW¼ sec. 28 and NE¼NW¼ sec. 33, (38-38E), about 500 ft. above Roosevelt Lk., Northport dist. **Elev:** 1,600 to 1,700 ft. **Access:** ¼ mi. NE. of Bossburg by road. **Prop:** 4 unpatented claims: Comet Silver, Mt. Vernon, Potomac, Silver Star. **Owner:** E. B. Gibbs and I. M. Hunley, Colville, Wash., operators (1951—). Optioned by Young America Mines, Inc., Seattle, Wash. (1951—), from Walter Morris and Perry Leighton, Colville, Wash. Young America Cliff Consolidated Mining Co. (1897-1905). Robena Silver Lead Co. (1907-1915). Bossburg-Yakima Co. (1923). Young America Mining Co. (1924-1930). Cuprite Mining Co. (1924-1943). **Ore:** Zinc, lead, silver, gold, copper. **Ore min:** Sphalerite, galena, pyrite, smithsonite, geocronite, cerussite, cervantite, stannite. **Gangue:** Quartz, calcite, siderite. **Deposit:** Irregular stringers and lenses of high-grade ore and disseminated ore in dolomite. One low-grade disseminated deposit occupies a zone 30 to 150 ft. wide and has been traced by diamond drilling for 900 ft. in length. **Dev:** 6 adits with considerable stoping between them total about 1,500 ft. **Improv:** 60-ton flotation mill (1952). **Assays:** Shipping ore av. 7% Pb, 7.7% Zn, 16.1 oz. Ag. Conc. from ore from one stope showed 3% Sb. A sample of geocronite showed 0.02% Sn, 58 oz. Ag. Pb:Zn ratio av. 1:2. One 5-ft. face shows

27.8% Pb, 9.6% Zn, 113 oz. Ag (1952). As much as \$3.00 Au has also been shown. **Prod:** A few carloads prior to 1890, 1922-1923, 1938, 1941, 1947-1954. 3 tons Pb conc. and 15 tons Zn conc. in 1950. 20 tons Pb conc. and 35 tons Zn conc. in 1951. **Ref:** 7, pp. 62-63. 12, pp. 26, 75-76. 13, p. 121. 22, p. 5. 30, pp. 82-83. 63, p. 112. 66. 73, pp. 117-118. 97, 1905, 1907, 1908, 1912, 1917, 1922-1924, 1928, 1930. 98, 1922-1926. 129, pp. 119-121. 132, pp. 148-153. 133, p. 31. 141, pp. 21, 22. 158. 164, p. 176.

WHATCOM COUNTY

Allen Basin (6)
(see under gold)

Azurite (11)
(see under gold)

Baltimore (7)
(see under gold)

Chain Lakes (4)

Loc: NW¼ sec. 24, (39-8E), at Chain Lakes. **Access:** 2 mi. by trail from end of Mt. Baker road. **Prop:** 3 claims. **Owner:** S. H. P. Vevelstad, Seattle, Wash. (1952—). H. E. Barnes, Bellingham, Wash. (1934). **Ore:** Zinc, silver, copper, gold. **Ore min:** Sphalerite, chalcopryrite, pyrite, bornite. **Gangue:** Volcanic rock and limestone. **Deposit:** Sulfides disseminated in brecciated volcanic rock, limestone, greenstone, and schist. **Dev:** 2 adits and several open cuts. **Assays:** Picked sample showed 47.8% Zn, 11.3% Fe, 1.6 oz. Ag. **Ref:** 158.

Chancellor (8)
(see under gold)

Evergreen (2)
(see under gold)

Galena
(see Verona under gold)

Gargett (1)
(see under gold)

Gold Hill (12)
(see under silver)

Golden Arrow
(see Tacoma under gold)

Great Excelsior (3)
(see under gold)

Indiana
(see Chancellor under gold)

Lincoln
(see Great Excelsior under gold)

Mammoth (9)
(see under gold)

Northern Cascade
(see Gold Hill under silver)

Peterson
(see Gold Hill under silver)

President
(see Great Excelsior under gold)

Tacoma (10)
(see under gold)

Verona (5)
(see under gold)

YAKIMA COUNTY

Black Jack (Green, Deep Creek) (4)

Loc: Sec. 36, (15-11E), on NW. side of Deep Cr. trail about 100 yd. N. of Little Twin Sisters Lk. **Access:** Trail. **Prop:** 17 claims. **Ore:** Zinc, copper. **Ore min:** Sphalerite, chalcopryrite, pyrite, bornite, chalcocite, galena. **Gangue:** Quartz, calcite. **Deposit:** 3 parallel mineralized stringers from 1 to 3 in. wide separated from one another by 12 in. of country rock. Country rock consists of thin-bedded sandstone, conglomerate, and mudstone. **Dev:** Inclined shaft at least 50 ft. deep, open cuts. **Assays:** Said to assay 20% to 30% Zn where exposed in Deep Cr. Extensions are of much lower grade but said to be of mining grade. **Ref:** 58, p. 7. 158.

Chinook (2)
(see under copper)

Deep Creek
(see Black Jack)

Gold Hill (1)
(see under gold)

Green
(see Black Jack)

Richmond (3)
(see under lead)

ZIRCONIUM

Properties—Because zirconium metal is difficult to prepare in a state of high purity, there is much confusion concerning its physical and chemical properties, many of the earlier data having been determined from impure metal. In the sponge form it is a bluish-black powder, but the fused metal is steel gray to lustrous silver white, resembling freshly broken cast iron. In many respects it resembles titanium, and also it is similar to hafnium. It is moderately hard, ductile, malleable, and strong. Zirconium is one of the most corrosion resistant of metals, resisting most acids, even when concentrated and hot, as well as hot concentrated caustic solutions. The metal is about five-sixths as heavy as iron, and its tensile properties are similar to those of mild steel. At high temperatures it has a great affinity for gases such as oxygen, nitrogen, hydrogen, and carbon dioxide. Unlike most

metals, it has a very low absorption for neutrons and therefore does not slow down atomic fission. Other properties are shown in the table on page 12.

Uses—The current chief use of zirconium metal is in atomic-power devices, where it is employed as a structural material. It has also been used as a "getter" in the production of electronic tubes, for lamp filaments, as a deoxidizer and scavenger in steel manufacture, in ammunition primers, blasting caps, rayon spinnerets, electrodes, photo-flash bulbs, flares, and welding rods for spot welding. It has proven useful in surgery for suture wires, bone pins, and plates, as tissue grows directly to it without deterioration. Zirconium is alloyed with iron and with nickel to increase their hardness, with tungsten to increase its ductility, with copper to increase its strength, and with aluminum and magnesium to improve certain of their

physical qualities. Zirconium oxide is used in refractories, being one of the most refractory oxides known. The oxide and other compounds are used in leather tanning, dyeing, ceramics, and pigments. Perfect crystals of the silicate, zircon, are valuable as gems.

Production—Very small amounts of zirconium have been produced in the United States for many years, but until 1952 the only substantial producer of the pure ductile metal was the United States Bureau of Mines, whose plant in 1953 was producing at the rate of 100,000 pounds per year, the entire output going to the Atomic Energy Commission. Although zircon occurs in black sands rather commonly in Washington, there has as yet been no production.

Prices—Zirconium metal powder was quoted in 1955 at \$10 per pound, which is not greatly different from the price 25 years earlier, but some of the purer ductile zirconium metal when first produced in this country sold for as much as \$650 per pound. The ore, zircon concentrate, 65 percent ZrO_2 , was quoted in 1955 at \$48 per ton de-

livered at Atlantic seaboard, which also was about the same as the price 25 years earlier.

Ore minerals—Zirconium is estimated to constitute 0.02 to 0.03 percent of the earth's crust and is more abundant than copper, lead, zinc, and silver combined. It is a constant and almost inseparable companion of hafnium. Although zirconium is a constituent of a number of minerals, only two are abundant enough to be ores. These are the silicate, zircon, $ZrSiO_4$, containing 67.2 percent ZrO_2 , and the oxide, baddeleyite, ZrO_2 , containing 74.0 percent zirconium. Both minerals generally carry up to 4 percent hafnium.

Geology—Zircon is a common accessory constituent of many granitic, volcanic, and metamorphic rocks and of sedimentary rocks and sands derived from them. Black sands of beach and river placers frequently are zirconium bearing. Common associated minerals are magnetite, ilmenite, monazite, and other heavy metallic and nonmetallic minerals. Baddeleyite occurs in pegmatites and placers derived from them.

OCCURRENCES

The map showing the numbered zirconium occurrences is plate 23, on page 59 in volume 2.

ASOTIN COUNTY

Clarkston Placer (1)
(see under gold, placer)

Snake River Placer
(see under gold, placer)

CLALLAM COUNTY

Cedar Creek Placer (2)
(see under gold, placer)

Lovelace Placer
(see Shi Shi Beach Placer under gold, placer)

Shi Shi Beach Placer (1)
(see under gold, placer)

Starbuck Placer
(see Cedar Creek Placer under gold, placer)

In the literature there are many mine and claim descriptions that fail to mention the ore present in the deposit. In some instances this was because no ore was found, and in others failure to mention the ore was merely

ORE UNKNOWN

The map showing the numbered mineral occurrences where the ore is unknown is plate 27, on page 67 in volume 2.

ASOTIN COUNTY

Lightfoot Chief
Loc: Asotin County. **Ore:** Unknown. **Ref:** 158.

DOUGLAS COUNTY

Columbia River Placer
(see under gold, placer)

FERRY COUNTY

Wilmont Bar Placer (1)
(see under gold, placer)

GARFIELD COUNTY

Pomeroy Placer
(see under gold, placer)

GRAYS HARBOR COUNTY

Damons Point Placer (1)
(see under titanium)

PACIFIC COUNTY

Beards Hollow Placer (1)
(see under platinum)

McGowan Placer (2)
(see under iron)

an oversight. Probably most prospects in this category are of little or no consequence, but, in order to make the record complete, they are listed and briefly described in the following pages.

OCCURRENCES

CHELAN COUNTY

Adolph (1)
Loc: Horseshoe Basin. **Owner:** Adolph Behring and Messrs. Speckler and Gates (1901). **Ore:** Unknown. **Ref:** 67, p. 38.

Bagley (29)
Loc: Near the Sunrise prospect, Wenatchee dist. **Owner:** C. P. Converse, Seattle, Wash. (1897). **Ore:** Unknown. **Ref:** 63, p. 71. **67,** p. 46.

Chelan Consolidated Copper

Loc: On Red Mtn., Chiwawa dist. **Prop:** 130 claims. Probably part of the property later held by the Royal Development Co. **Ore:** Unknown. **Ref:** 67, pp. 22-23.

Chelan Falls (19)

Loc: Chelan Butte dist. **Ore:** Unknown. **Ref:** 105, no. 13, 1903, p. 324.

Christy (2)

Loc: Near the Twin Falls prospect, Stehekin dist. **Owner:** Albert Pershall and M. M. Kingman (1897). **Ore:** Unknown. **Ref:** 63, p. 83. 67, p. 39.

Clinton

Loc: Leavenworth dist. **Owner:** Louis Davis Laboratory Co. (1915). **Ore:** Unknown. **Ref:** 67, p. 28.

Comet

Loc: T. 35 N., R. 15 E., Stehekin dist. **Ore:** Unknown. **Ref:** 13, p. 177.

Copper King

Loc: On Agnes Cr., Stehekin dist. **Ore:** Unknown. **Ref:** 67, p. 39.

Diamond Drill (20)

Loc: Blewett dist. **Ore:** Unknown. **Ref:** 104, 7/15/32, p. 7.

East Side

(see Mayflower and East Side)

Eureka (24)

Loc: N. of Golden King mine, and extending into Dry Gulch, Wenatchee dist. **Owner:** Angus Mackintosh (1897). **Ore:** Unknown. **Ref:** 63, p. 71. 67, p. 46.

Gertie (3)

Loc: Stehekin dist. near Doubtful Lk. **Owner:** Genne and George Taylor (1897). **Ore:** Unknown. **Ref:** 63, p. 83. 67, p. 40.

Gibson (12)

Loc: SE $\frac{1}{4}$ sec. 2, (31-18E), on N. bank of Meadow Cr. **Prop:** 1 claim. **Owner:** E. F. Christy, A. H. Murdock, and Mr. Buckingham (1897). **Ore:** Unknown. **Ref:** 63, p. 81. 67, p. 32.

Gilman (25)

Loc: N. of Golden King mine on same ore zone, Wenatchee dist. **Owner:** D. H. Gilman, Seattle, Wash. (1897). **Ore:** Unknown. **Ref:** 63, p. 71. 67, p. 46.

Granite (13)

Loc: Center sec. 2, (31-19E), E. of Gibson prospect, Meadow Cr. dist. **Prop:** 1 claim. **Owner:** Frank Lightner (1897). **Ore:** Unknown. **Ref:** 63, p. 81. 67, p. 32.

Happy Thought (14)

Loc: SW $\frac{1}{4}$ sec. 2, (31-18E), adjoining Sunday Morning claim on the SE., Meadow Cr. dist. **Prop:** 1 claim. **Owner:** J. R. Moore (1897). **Ore:** Unknown. **Ref:** 63, p. 82. 67, p. 32.

Iron Cap (15)

Loc: SW $\frac{1}{4}$ sec. 1, (31-18E), Meadow Cr. dist. **Prop:** 1 claim. **Owner:** S. J. Gray (1897). **Ore:** Unknown. **Ref:** 63, p. 81. 67, p. 33.

Iron Cross (16)

Loc: E. of Blue Jay claim on Meadow Cr. **Prop:** 2 claims. **Owner:** Messrs. Turner and Bull (1897). **Ore:** Unknown. **Ref:** 63, p. 81. 67, p. 33.

Kingman (4)

Loc: Sec. 32, (35-15E), at head of lower Horseshoe Basin, adjoining Black Warrior on the E. **Access:** Road from Stehekin, and short trail. **Prop:** 2 claims. **Owner:** Keith and Kenneth Kingman, Chelan, Wash. (1942). **Ore:** Unknown. **Deposit:** Continuation of the Black Warrior vein. **Ref:** 67, p. 41.

Lady of the Lake (5)

Loc: Stehekin dist. **Ore:** Unknown. **Ref:** 13, p. 143.

Last Chance (26)

Loc: W. of and parallel to the Golden King property, Wenatchee dist. **Owner:** J. M. Rae (1897). **Ore:** Unknown. **Dev:** Short adit. **Ref:** 63, p. 71. 67, p. 46.

Leavenworth

Loc: Chelan County. **Ore:** Unknown. **Ref:** 97, 1914, p. 329.

Lucky Dick

Loc: Lk. Chelan area. **Ore:** Unknown. **Ref:** 158.

Mattie Jane (17)

Loc: SW $\frac{1}{4}$ sec. 1, (31-18E), E. of Emma Lee claim of King Solomon group, Meadow Cr. dist. **Prop:** 1 claim. **Owner:** S. J. Gray and William Rasnic (1897). **Ore:** Unknown. **Ref:** 63, p. 81. 67, p. 33.

Mayflower and East Side (10)

Loc: On Bridge Cr., Stehekin dist. **Owner:** William Keho and Henry Quinn (1897). **Ore:** Unknown. **Ref:** 63, p. 84. 67, p. 42.

Silver Bell (11)

Loc: Sec. 36, (32-18E), just E. of Moscow prospect, Meadow Cr. dist. **Prop:** 1 claim. **Owner:** Andrew Crumrine, J. W. Nicol, and N. B. Church (1897). **Ore:** Unknown. **Ref:** 63, p. 81. 67, p. 34.

State

Loc: 5 mi. above the mouth of Ingalls Cr. **Prop:** 6 claims. **Owner:** John and William Lynch. **Ore:** Unknown. **Ref:** 63, p. 77. 67, p. 18.

Stoner (23)

Loc: SW $\frac{1}{4}$ sec. 2, (22-17E), near head of Culver Gulch, Blewett dist. **Access:** Tractor road. **Owner:** Gold Bond Mining Co. (1936). **Ore:** Unknown. **Dev:** The Stoner tunnel was driven to be used for removal of ore from the Phipps tunnel across the ridge to the N. **Ref:** 67, p. 18.

Sunnyside (6)

Loc: Near Doubtful Lk., Stehekin dist. **Owner:** Britanus Stennis (1897). **Ore:** Unknown. **Ref:** 63, p. 83. 67, p. 43.

Sunrise (27)

Loc: Sec. 16, (22-20E), on N. side of Dry Gulch, Wenatchee dist. **Owner:** M. J. Carkeek (1897). **Ore:** Unknown. **Ref:** 63, p. 71. 67, p. 47.

Tibbie (28)

Loc: Near the Sunrise prospect, Wenatchee dist. **Owner:** P. P. Shelby (1897). **Ore:** Unknown. **Dev:** 40-ft. open cut. **Ref:** 63, p. 71. 67, p. 47.

Viola (7)

Loc: Near the Twin Falls prospect, Stehekin dist. **Owner:** F. F. Keller (1897). **Ore:** Unknown. **Ref:** 63, p. 83. 67, p. 44.

Water Fall (8)

Loc: Stehekin dist. **Ore:** Unknown. **Ref:** 13, p. 143.

White Cap (9)

Loc: Stehekin dist. **Ore:** Unknown. **Ref:** 13, p. 143.

Winnipeg (18)

Loc: Sec. 12, (31-18E), E. of Blue Jay claims, Meadow Cr. dist. Prop: 1 claim. Owner: A. Crumrine (1897). Ore: Unknown. Ref: 63, p. 81. 67, p. 34.

FERRY COUNTY**Anonymous (5)**

Loc: Belcher dist. Owner: Straight Mines Co. (1907). Ore: Unknown. Ref: 116, no. 6, 1907, p. 16.

Bonanza Fraction (27)

Loc: Keller dist. Owner: Konda Bros. M. & M. Co. (1915). Ore: Unknown. Ref: 158.

Bortle (4)

Loc: SE $\frac{1}{4}$ sec. 7, (37-34E), Belcher dist. Ore: Unknown. Ref: 114, no. 1, 1907, p. 3; no. 5, 1909, p. 71.

Bummer (28)

Loc: Keller dist. Owner: Silver Crown Mining Co. (1909). Ore: Unknown. Ref: 114, no. 5, 1909, p. 71.

Buster (20)

Loc: Covada dist. Ore: Unknown. Ref: 114, no. 5, 1909, p. 74.

Churchill (3)

Loc: Sec. 31, (38-34E), Belcher dist. Owner: North Colville Mining & Smelting Co. (1907). Ore: Unknown. Ref: 114, no. 5, 1909, p. 72. 116, no. 9, 1907, pp. 18, 23.

Cuba (2)

Loc: Curlew dist. Owner: LaFleur Mining & Smelting Co. (1908). Ore: Unknown. Ref: 33, 1908, p. 855.

Evening Star (1)

Loc: Danville dist. Ore: Unknown. Ref: 158.

Golden Zone (29)

Loc: Keller dist. Ore: Unknown. Ref: 158.

Goldsmith (12)

Loc: Sec. 22, (32-36E), Covada dist. Ore: Unknown. Ref: 58, p. 26.

Iron Age (30)

Loc: Keller dist. Ore: Unknown. Ref: 158.

Iron Rod (6)

Loc: Belcher dist. Ore: Unknown. Ref: 158.

Ironsides (26)

Loc: NE $\frac{1}{4}$ sec. 2, (31-36E), Covada dist. Ore: Unknown. Ref: 158.

Josie (8)

Loc: Republic dist. Ore: Unknown. Ref: 158.

Kirkpatrick (13)

Loc: SE $\frac{1}{4}$ sec. 25, (32-36E), Covada dist. Ore: Unknown. Ref: 158.

Last Chance (17)

Loc: NW $\frac{1}{4}$ sec. 32, (32-36E), Covada dist. Ore: Unknown. Ref: 158.

Liberty Bell (21)

Loc: Covada dist. Ore: Unknown. Ref: 158.

Lincoln (31)

Loc: Keller dist. Ore: Unknown. Ref: 158.

Lookout (14)

Loc: NE $\frac{1}{4}$ sec. 36, (32-36E), Covada dist. Ore: Unknown. Ref: 158.

Lost Lode (9)

Loc: Republic dist. Owner: Flathead Exploration & Development Co. (1918). Ore: Unknown. Ref: 112, p. 178.

Maple (10)

Loc: Republic dist. Ore: Unknown. Ref: 158.

Meadowlark (18)

Loc: SE $\frac{1}{4}$ sec. 30, (32-36E), Covada dist. Ore: Unknown. Ref: 158.

Mohawk (11)

Loc: Republic dist. Ore: Unknown. Ref: 158.

Mountain View (15)

Loc: NW $\frac{1}{4}$ sec. 26, (32-36E), Covada dist. Ore: Unknown. Ref: 158.

Raspberry (22)

Loc: SW $\frac{1}{4}$ sec. 27, (32-36E), Covada dist. Ore: Unknown. Ref: 158.

Rising Sun (19)

Loc: NE $\frac{1}{4}$ sec. 32, (32-36E), Covada dist. Ore: Unknown. Ref: 158.

Salina (7)

Loc: Belcher dist. Ore: Unknown. Prod: 1915. Ref: 158.

Seattle (23)

Loc: Covada dist. Ore: Unknown. Ref: 158.

Stemwinder (24)

Loc: Covada dist. Ore: Unknown. Prod: 1939. Ref: 97, 1940, p. 477.

Tomboy (16)

Loc: NW $\frac{1}{4}$ sec. 36, (32-36E), Covada dist. Ore: Unknown. Ref: 158.

Tyler (25)

Loc: Covada dist. Ore: Unknown. Prod: 1939. Ref: 58, p. 69. 97, 1940, p. 477.

Wells (32)

Loc: Keller dist. Ore: Unknown. Ref: 158.

GRAYS HARBOR COUNTY**Damons Point (1)**

Loc: Grays Harbor County. Ore: Unknown. Ref: 105, no. 4, 1904, p. 70; no. 5, 1908, p. 78.

KING COUNTY**Ascherfeld (Jones, Sunday Creek) (7)**

Loc: NE $\frac{1}{4}$ sec. 24, (25-9E), on SW. slope of Mt. Webster. Elev: 2,100 ft. Access: Reached from North Bend by 22 mi. of graveled road and 2 mi. of private road. Prop: Large group of unpatented claims including 13 formerly held by the Defense Mining Co. Owner: Ascherfeld Mining Associates, Inc. (1947). Ore: None. Ore min: None. Deposit: Open cut in black argillite shows no mineralization of any kind. Dev: Open cut. Improv: 4 buildings, compressor, diamond drill, 2 bulldozers, 4 light plants, various vehicles (1947). Ref: 158.

Belle

Loc: Miller R. dist. Ore: Unknown. Ref: 63, p. 38.

Black Jack (15)

Loc: On Mt. Si, 1 $\frac{1}{2}$ mi. from North Bend. Prop: 2 claims: Black Jack, Galena Star. Ore: Unknown. Dev: 200-ft. adit, other adits. Ref: 13, p. 168.

Black Prince

Loc: Snoqualmie dist. Ore: Unknown. Ref: 63, p. 42.

Clara K. (11)

Loc: Cleopatra Basin, Miller R. dist. Ore: Unknown. Ref: 63, p. 38.

Commonwealth (17)

Loc: Sec. 26, (23-11E), Gold Cr. dist. Ore: Unknown. Ref: 58, p. 15.

Copper Bell (14)

Loc: NW¼ sec. 36, (24-8E), Snoqualmie dist. **Ore:** Unknown. **Deposit:** Vein along contact between granite and gneiss, with 4 cross veins 1 to 4 ft. wide. **Ref:** 63, p. 42.

Double Stamp (2)

Loc: Parallel to Lone Star, Miller R. dist. **Ore:** Unknown. **Ref:** 63, p. 38.

Galena Star

Loc: Snoqualmie dist. **Ore:** Unknown. **Ref:** 13, p. 168.

Hardy

(see Milton-Hardy)

Jones

(see Ascherfeld)

Jumbo (12)

Loc: Across river from Mt. Gem, Miller R. dist. **Ore:** Unknown. **Ref:** 63, p. 38.

McKinley (3)

Loc: Parallel to Lone Star, Miller R. dist. **Ore:** Unknown. **Ref:** 63, p. 38.

Markley (4)

Loc: Extension of Lone Star, Miller R. dist. **Ore:** Unknown. **Ref:** 63, p. 38.

Milton-Hardy (8)

Loc: Secs. 14 and 23, (25-10E), Miller R. dist. **Ore:** Unknown. **Ref:** 158.

Mina (5)

Loc: Extension of Lone Star, Miller R. dist. **Ore:** Unknown. **Ref:** 63, p. 38.

Orphan Girl (1)

Loc: Extension of Mono, Miller R. dist. **Ore:** Unknown. **Ref:** 63, p. 38.

Portland (13)

Loc: NW¼ sec. 20, (25-11E), near Francis Lk., Miller R. dist. **Ore:** Unknown. **Deposit:** Ore occurs as pockets, richest close to the walls but occurs also across the entire 18-ft. mineralized zone in granodiorite. **Ref:** 147, p. 183.

Red Butte (9)

Loc: Sec. 14, (25-10E), Buena Vista dist. **Prop:** 5 claims. **Owner:** Albert Pearson is trustee (1947). **Ore:** Unknown. **Ore min:** Pyrite. **Deposit:** Sparsely disseminated pyrite in quartzite at its contact with granite. **Ref:** 158.

Spider (6)

Loc: Extension of Lone Star, Miller R. dist. **Ore:** Unknown. **Ref:** 63, p. 38.

Sunday Creek

(see Ascherfeld)

Tornado (10)

Loc: Extension of Coney Basin, Miller R. dist. **Ore:** Unknown. **Ref:** 63, p. 37.

United Cascade Mining Co. (16)

Loc: Sec. 1, (23-11E), and sec. 36, (24-11E), Miller R. dist. **Owner:** United Cascade Mining Co., Seattle, Wash. (1941). **Ore:** Unknown. **Ref:** 58, p. 70.

KITTITAS COUNTY

Bald Eagle

Loc: Cle Elum dist. **Ore:** Unknown. **Ref:** 13, p. 165.

Billy Goat (1)

Loc: Swauk dist. **Owner:** State of Washington Mining Co. (1915). **Ore:** Unknown. **Ref:** 158.

Black Bear

Loc: Cle Elum dist. **Owner:** Dover Mining Co. (1914). **Ore:** Unknown. **Ref:** 105, no. 14, 1914, p. 592.

Copper Prince

Loc: Cle Elum dist. **Owner:** Gallagher Mining & Milling Co. (1907-1908). Gallagher Mining & Development Co. (1905). **Ore:** Unknown. **Ref:** 33, 1907, p. 617; 1908, pp. 706-707. 97, 1905, p. 336.

Cottontail

Loc: Kittitas County. **Ore:** Unknown. **Ref:** 158.

Davis

Loc: Cle Elum dist. **Ore:** Unknown. **Ref:** 13, p. 165.

Eureka

Loc: Cle Elum dist. **Ore:** Unknown. **Ref:** 13, p. 165.

Glover

Loc: Cle Elum dist. **Ore:** Unknown. **Ref:** 13, p. 134.

Green Bear

Loc: Cle Elum dist. **Owner:** Donald C. Smith (1917). **Ore:** Unknown. **Ref:** 158.

Ione Fraction

Loc: Kittitas County. **Ore:** Unknown. **Prod:** 1938. **Ref:** 97, 1939, p. 490.

Little New York

(see Phoenix and Little New York)

Lucky Boy (2)

Loc: Swauk dist. **Ore:** Unknown. **Ref:** 158.

Madeleine

Loc: Cle Elum dist. **Ore:** Unknown. **Ref:** 13, p. 135.

Merrick (3)

Loc: Swauk dist. **Ore:** Unknown. **Prod:** 1910. **Ref:** 158.

Mountain Sprite

Loc: Cle Elum dist. **Ore:** Unknown. **Ref:** 13, p. 133.

Once There

Loc: Cle Elum dist. **Ore:** Unknown. **Ref:** 13, p. 135.

Phoenix and Little New York (4)

Loc: Swauk dist. **Ore:** Unknown. **Prod:** 1912. **Ref:** 158.

Rainbow

Loc: Cle Elum dist. **Ore:** Unknown. **Ref:** 158.

Red Jacket (5)

Loc: Swauk dist. **Owner:** Washington & Iowa Mining Co. (1915). **Ore:** Unknown. **Ref:** 158.

Robert E. Lee

Loc: Cle Elum dist. **Ore:** Unknown. **Ref:** 13, p. 134.

Silver Belle No. 2

Loc: Cle Elum dist. **Ore:** Unknown. **Ref:** 13, p. 135.

Silver Dump

Loc: Cle Elum dist. **Ore:** Unknown. **Ref:** 13, p. 135.

Silver King

Loc: Cle Elum dist. **Ore:** Unknown. **Ref:** 13, p. 135.

Tacoma

Loc: Cle Elum dist. **Ore:** Unknown. **Ref:** 13, p. 135.

Taft (6)

Loc: Swauk dist. **Ore:** Unknown. **Ref:** 158.

Wolf (7)

Loc: Swauk dist. **Ore:** Unknown. **Prod:** 1912. **Ref:** 158.

LEWIS COUNTY

Peterson (1)

Loc: Near center NE¼NE¼ sec. 1, (12-4E), about 1,200 ft. E. of the Spencer workings. **Elev:** 1,475 ft. **Access:** Trail. **Ore:** Unknown. **Ore min:** Pyrite. **Deposit:** Altered diabasic rock at the intersection of 2 faults contains disseminated pyrite but no cinnabar. **Dev:** 87-ft. adit, open cuts. **Ref:** 92-A, pp. 41-42.

MASON COUNTY

Darky (Keller) (1)

Loc: Near mouth of Seven Stream on Skokomish R., in sec. 7 or 18, (24-5W). **Elev:** 1,600 ft. **Access:** Trail. **Ore:** Unknown. **Ore min:** Pyrite. **Gangue:** Argillite. **Deposit:** Sparsely disseminated pyrite in breccia zone 10 ft. wide in argillite near greenstone contact. **Dev:** Three adits, one more than 100 ft. long. **Ref:** 48-A, p. 41. 158.

Keller

(see Darky)

OKANOGAN COUNTY

Alyna

Loc: Wannacut Lk. dist. **Ore:** Unknown. **Ref:** 13, p. 122.

Americanetta

Loc: Conconully dist. **Owner:** Viola Copper-Gold Mining Co. (1906-1918). **Ore:** Unknown. **Ref:** 33, 1907-1918. 105, no. 16, 1906, p. 469.

Ashton (9)

Loc: Sec. 22, (34-18E), near South Cr. **Elev:** 4,500 to 5,500 ft. **Access:** 4 mi. by trail from Twisp R. road. **Prop:** 5 patented claims. **Owner:** Bill Johnson, Twisp, Wash. (1946). **Ore:** Unknown. **Dev:** Several adits and open cuts. **Ref:** 158.

Aurora (Deer Creek, Lucky Strike) (21)

Loc: Near center T. 34 N., R. 31 E., near head of Deer Creek. **Prop:** 9 unpatented claims: Deer Creek Nos. 1 to 5, Lucky Strike Nos. 1 and 2, Great Northern No. 1, and Silver King. **Owner:** Aurora Mining Co., Inc. **Ore:** Unknown. **Dev:** 110-ft. adit, 65-ft. shaft. **Ref:** 158.

Banner

Loc: Conconully dist. **Ore:** Unknown. **Ref:** 13, p. 112.

Beggar's Choice (11)

Loc: Sec. 28, (40-25E), Mt. Chopaka area. **Prop:** 1 patented claim. **Owner:** Nighthawk Mines, Inc. (1938). **Ore:** Unknown. **Ref:** 158.

Ben Everett

Loc: Conconully dist. **Ore:** Unknown. **Ref:** 13, p. 130.

Bonanza

Loc: Conconully dist. **Ore:** Unknown. **Ref:** 13, p. 112.

Bonanza Chief (1)

Loc: SE¼ sec. 13, (37-17E), on crest of the Cascade Divide about 1½ mi. S. of Harts Pass. **Elev:** 6,000 ft. **Prop:** 1 unpatented claim. **Owner:** Charles Willman, Winthrop, Wash.

(1946). **Ore:** Unknown. **Deposit:** Irregular quartz veins along a fracture zone in sedimentary rocks. Veins generally less than 1 ft. thick, but one is 3 to 4 ft. thick. **Ref:** 158.

Bonanza King

Loc: Conconully dist. **Ore:** Unknown. **Ref:** 13, p. 95.

Boomer

Loc: Conconully dist. **Ore:** Unknown. **Ref:** 13, p. 112.

Buckhorn (13)

Loc: Sec. 29, (35-25E), W. of Salmon Cr., Conconully dist. **Prop:** Several claims. **Ore:** Unknown. **Gangue:** Quartz, gouge. **Deposit:** Shear zone in schist consists of black gouge and nodules of quartz. No metallic minerals apparent. **Dev:** 175-ft. adit. **Ref:** 12, p. 61. 75, p. 31.

Cape Nome (23)

Loc: Nespelem dist. **Ore:** Unknown. **Ref:** 158.

Central

Loc: Mazama dist. **Owner:** Oriental Mining Co. (1902). **Ore:** Unknown. **Ref:** 88, p. 35.

Clayton (4)

Loc: Sec. 8, (35-20E), Twisp dist. **Owner:** Abandoned. **Ore:** Unknown. **Dev:** 600 to 700 ft. of adit work and one shaft reported. **Ref:** 158.

Conconully Copper

Loc: Conconully dist. **Owner:** Conconully Copper Co. (1909). **Ore:** Unknown. **Ref:** 114, no. 5, 1909.

Deer Creek

(see Aurora)

Deerfly (15)

Loc: SW¼ sec. 22, (40-30E), Myers Cr. dist. **Ore:** Unknown. **Ref:** 158.

Dewey (18)

Loc: NE¼ sec. 26, (40-30E), Myers Cr. dist. **Ore:** Unknown. **Ref:** 158.

Dundee

Loc: Oroville dist. **Ore:** Unknown. **Ref:** 104, 5/15/36, p. 28.

Echo Gulch (6)

Loc: Sec. 16, (35-20E), on SW. side of Methow Valley about 10 mi. NW. of Winthrop. **Owner:** Abandoned (1946). **Ore:** Unknown. **Ref:** 158.

Glory

Loc: Conconully dist. **Ore:** Unknown. **Ref:** 13, p. 98.

Golden King

Loc: Palmer Mtn. dist. **Ore:** Unknown. **Ref:** 158.

Granite

Loc: Conconully dist. **Ore:** Unknown. **Ref:** 13, p. 97.

Gussie Everett

Loc: Conconully dist. **Ore:** Unknown. **Ref:** 13, p. 110.

Haggerty

Loc: Twisp dist. **Ore:** Unknown. **Ref:** 13, p. 113.

Humboldt

Loc: Twisp dist. **Ore:** Unknown. **Ref:** 158.

Ida May

Loc: Conconully dist. **Ore:** Unknown. **Ref:** 13, p. 98.

Indiana

Loc: Twisp dist. **Ore:** Unknown. **Prod:** 1937. **Ref:** 97, 1938, p. 459.

Kaywash (5)

Loc: Sec. 8 (?), (35-20E), on SW. side of Methow Valley about 11 mi. NW. of Winthrop. **Owner:** Abandoned (1946). **Ore:** Unknown. **Ref:** 158.

Keno (14)

Loc: Secs. 7 and 8, (40-30E). **Prop:** 7 patented claims. **Owner:** Mad River Mining Co. (1911-1915). **Ore:** Unknown. **Deposit:** Several strong quartz veins near contact of granite with schist, quartzite, greenstone, and some limestone. **Dev:** Various open cuts and shafts. **Ref:** 105, 1906, p. 391. 154, p. 51.

Keystone (19)

Loc: NW¼ sec. 35, (40-30E), Myers Cr. dist. **Owner:** Interstate Mining Corp., Columbus, Ohio (1903). **Ore:** Unknown. **Ref:** 100, 1903, p. 102.

Kismet

Loc: Conconully dist. **Ore:** Unknown. **Ref:** 13, p. 110.

La Plata

Loc: Twisp dist. **Ore:** Unknown. **Ref:** 13, p. 113.

Lucky Dog

Loc: Mazama dist. **Ore:** Unknown. **Prod:** 1910. **Ref:** 158.

Lucky Jim (7)

Loc: Sec. 16, (35-20E), on SW. side of Methow Valley. **Access:** About 10 mi. NW. of Winthrop. **Prop:** 8 patented claims. **Owner:** L. G. Halloway, Winthrop, Wash. (1946). **Ore:** Unknown. **Dev:** 1 adit 750 to 800 ft. long, 2 shorter adits, and 1 shaft are reported. **Ref:** 158.

Lucky Strike

(see Aurora)

Lucky Sunday (3)

Loc: SW¼ sec. 16, (36-20E), on Montana Cr. trail. **Access:** About 1 mi. from the Goat Cr. road. **Ore:** Unknown. **Deposit:** A 1-ft. quartz vein in diorite. **Dev:** 1 open cut. **Ref:** 158.

J. M. Lundy

Loc: Twisp dist. **Ore:** Unknown. **Ref:** 158.

Marvel

Loc: Twisp dist. **Ore:** Unknown. **Ref:** 158.

Mayflower

Loc: Conconully dist. **Ore:** Unknown. **Ref:** 13, p. 98.

Missing Link

Loc: Conconully dist. **Ore:** Unknown. **Ref:** 13, p. 86.

Modoc Chief

Loc: Conconully dist. **Ore:** Unknown. **Ref:** 13, p. 86.

Monto Oro

Loc: Palmer Mtn. dist. **Ore:** Unknown. **Prod:** 1938. **Ref:** 97, 1940, p. 478.

Mount Bay

Loc: Conconully dist. **Ore:** Unknown. **Ref:** 13, p. 98.

Mountain Lily

Loc: Near head of South Cr., in Gilbert area. **Access:** 4 to 8 mi. from Twisp R. road. **Owner:** Abandoned (1946). **Ore:** Unknown. **Ref:** 158.

Mug

Loc: Conconully dist. **Ore:** Unknown. **Ref:** 13, p. 97.

Northern Light

Loc: Conconully dist. **Ore:** Unknown. **Ref:** 13, p. 86.

Ocean Wave

Loc: Methow dist. **Ore:** Unknown. **Ref:** 58, p. 50.

Onward

Loc: Conconully dist. **Ore:** Unknown. **Ref:** 13, p. 97.

Original

Loc: Conconully dist. **Ore:** Unknown. **Ref:** 13, p. 86.

Pacific

Loc: Conconully dist. **Ore:** Unknown. **Ref:** 13, p. 97.

Pasco

Loc: Wannacut Lk. dist. **Ore:** Unknown. **Ref:** 13, p. 105.

Peak

Loc: Myers Cr. dist. **Ore:** Unknown. **Ref:** 158.

Philadelphia (20)

Loc: NW. cor. sec. 25, (40-30E), Myers Cr. dist. **Ore:** Unknown. **Ref:** 158.

Portland (8)

Loc: Sec. 11, (34-18E), Twisp dist. **Ore:** Unknown. **Ref:** 58, p. 55.

Rainbow (17)

Loc: NE¼ sec. 23, (40-30E), Myers Cr. dist. **Prop:** 3 claims. **Ore:** Unknown. **Gangue:** Garnet, epidote. **Deposit:** Garnet-epidote rock incorporated in quartzite and schist. **Dev:** 3 small shafts, and a 400-ft. adit from which a little drifting has been done. **Ref:** 154, p. 48.

Rattler

Loc: Myers Cr. dist. **Ore:** Unknown. **Ref:** 158.

Roseman

Loc: Twisp dist. **Ore:** Unknown. **Ref:** 13, p. 113.

Sailor Boy (24)

Loc: Near NE. cor. sec. 28, (31-30E), Nespelem dist. **Owner:** William Bernard and E. Christianson (1939). **Ore:** Unknown. **Deposit:** The adit, in granite, exposes no ore minerals. **Dev:** 240-ft. adit. **Ref:** 158.

Second Thought

Loc: Conconully dist. **Ore:** Unknown. **Ref:** 13, p. 86.

Silver Horse

Loc: Wauconda dist. **Owner:** Wm. H. Parr (1935). **Ore:** Unknown. **Ref:** 104, 4/30/35, p. 29.

Silver Star (12)

Loc: Near SE. cor. sec. 33, (38-26E). **Owner:** Abandoned (1939). **Ore:** Unknown. **Ore min:** Pyrite. **Deposit:** Discontinuous quartz veins from less than an in. to 3 ft. wide. Veins followed by the adit pinch out in from 30 to 50 ft. Country rock is slate and quartzite. **Dev:** 1,100-ft. adit. **Ref:** 158.

Similkameen (10)

Loc: Sec. 3, (40-26E), Oroville dist. **Owner:** Similkameen Custom Mining & Smelting Co. (1939). **Ore:** Unknown. **Ref:** 108, 7/39.

Snowflake

Loc: Conconully dist. **Ore:** Unknown. **Ref:** 13, p. 97.

Sonoma

Loc: Conconully dist. **Ore:** Unknown. **Ref:** 13, p. 112.

Sunflower (22)

Loc: Sec. 28, (32-30E), Nespelem dist. **Owner:** C. H. Massar. **Ore:** Unknown. **Ref:** 158.

Telephone

Loc: Conconully dist. **Ore:** Unknown. **Ref:** 13, p. 97.

Thompson

Loc: Conconully dist. Ore: Unknown. Ref: 13, p. 97.

U. S. Treasure (16)

Loc: NW¼ sec. 20, (40-30E), Myers Cr. dist. Ore: Unknown. Ref: 158.

Union

Loc: Conconully dist. Ore: Unknown. Ref: 13, p. 112.

Weymyer (2)

Loc: Sec. 19 (?), (36-20E), near Goat Cr. road. Access: About 4 mi. from Mazama on Goat Cr. road. Owner: S. W. Shafer, Winthrop, and Tom C. Luke, Mazama, Wash. (1946). Ore: Unknown. Ref: 158.

Wheel of Fortune

Loc: Conconully dist. Ore: Unknown. Ref: 13, p. 86.

Wide West

Loc: Wannacut Lk. dist. Ore: Unknown. Ref: 13, p. 105.

Yellow Jacket

Loc: Conconully dist. Ore: Unknown. Ref: 13, p. 111.

PEND OREILLE COUNTY

Bettencourt

Loc: Metaline dist. Ore: Unknown. Ref: 158.

Bonnie Blue Belle

Loc: Metaline dist. Ore: Unknown. Ref: 13, p. 156.

Brown (9)

Loc: Sec. 29, (30-43E), Newport dist. Prop: Several unpatented claims. Owner: Mr. Brown and associates (1941). Ore: Unknown. Deposit: 2 outcrops of 18-in. quartz veins appear to be barren of mineralization. Dev: Adit and shaft. Ref: 29, p. 74.

Emerald (4)

Loc: SW¼ sec. 15, (39-43E), Metaline dist. Ore: Unknown. Ref: 158.

Josie (2)

Loc: Sec. 11, (40-44E), Metaline dist. Prop: 3 unpatented claims. Owner: Abandoned (1941). Ore: Unknown. Dev: Open cuts. Ref: 29, p. 58.

Log Cabin (7)

Loc: NE¼ sec. 29, (38-43E), Metaline dist. Ore: Unknown. Ref: 114, no. 5, 1907, p. 54.

Malden (5)

Loc: SW¼ sec. 20, (39-43E), Metaline dist. Owner: Malden M. M. and M. Co. (1908). Ore: Unknown. Ref: 116, no. 6, 1908, p. 139. 158.

Opal

Loc: Metaline dist. Ore: Unknown. Ref: 158.

Pine Hill (1)

Loc: Sec. 1, (40-43E), Metaline dist. Prop: 6 unpatented claims. Owner: Abandoned (1941). Ore: Unknown. Deposit: Slight mineralization. Ref: 29, p. 50.

Rectangle

Loc: Pend Oreille County. Owner: Mt. View Mining Co. (1915). Ore: Unknown. Ref: 158.

Storm (8)

Loc: Sec. 28, (33-43E), Newport dist. Prop: 2 unpatented claims. Owner: Abandoned (1941). Ore: Unknown. Deposit:

Slight mineral stains cover a wide area. Dev: Small open cuts. Ref: 29, p. 74.

Wall Street (6)

Loc: SE¼ sec. 4, (38-43E), Metaline dist. Ore: Unknown. Ref: 114, no. 5, 1909, p. 54.

Wide West (3)

Loc: SW¼ sec. 27, (40-43E), Metaline dist. Ore: Unknown. Ref: 114, no. 5, 1909, p. 54.

PIERCE COUNTY

Apex (1)

Loc: In basin on S. end of Crystal Mtn., approx. in sec. 25, (17-10E). Owner: Apex Mining Co., Harry Poole, H. F. Smith, T. H. Smith, and Jack Brown (1945). Ore: Unknown. Ore min: Pyrite. Deposit: Mineralized volcanic rock. Improv: Cabin (1945). Ref: 158.

Big Load

Loc: Summit dist. Ore: Unknown. Ref: 158.

Clipper

Loc: Carbon R. dist. Ore: Unknown. Ref: 88, p. 91.

Little Gem

Loc: Pierce County. Ore: Unknown. Ref: 63, p. 45.

Summit

Loc: Summit dist. Ore: Unknown. Ref: 158.

Vermont

Loc: Summit dist. Prop: 6 claims: Vermont Nos. 1-6. Ore: Unknown. Ref: 158.

SKAGIT COUNTY

Baltimore

Loc: Cascade dist. Ore: Unknown. Ref: 13, p. 174.

Black Stallion (1)

Loc: SE¼ sec. 24, (35-13E), at SW. edge of Boston Basin. Access: Trail. Prop: 1 claim. Ore: Unknown. Ore min: Pyrite. Deposit: Mineralized diabase dike in diorite gneiss. Dev: Short adit. Ref: 158.

Buffalo

Loc: Cascade dist. Ore: Unknown. Ref: 13, p. 173.

Cincinnati

Loc: Cascade dist. Ore: Unknown. Ref: 13, p. 173.

Hartay (2)

Loc: Head of Thunder Cr. Basin. Ore: Unknown. Ref: 63, p. 59.

Helena Butte

Loc: Cascade dist. Ore: Unknown. Ref: 13, p. 140.

Homestake

Loc: Cascade dist. Ore: Unknown. Ref: 63, p. 56.

Jumbo

Loc: Near Granite property, Cascade dist. Ore: Unknown. Ref: 63, p. 56.

King Solomon

Loc: Cascade dist. Ore: Unknown. Ref: 13, p. 142.

Logan

Loc: Skagit County. Ore: Unknown. Ref: 119, no. 2, 1912, p. 1.

Montreal

Loc: Cascade dist. **Ore:** Unknown. **Ref:** 13, p. 140.

New York

Loc: Cascade dist. **Ore:** Unknown. **Ref:** 13, p. 140.

SKAMANIA COUNTY**Big Blue (5)**

Loc: Secs. 21 and 28, (10-6E). **Owner:** Ralph Cutler, Portland, Oreg. (1937). **Ore:** Unknown. **Ref:** 158.

Blue Bird

Loc: Washougal dist. **Ore:** Unknown. **Ref:** 158.

Bonanza (1)

Loc: NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 17, (9-5E), Mt. St. Helens dist. **Access:** $\frac{1}{4}$ mi. by trail N. from main highway 3 mi. W. of Spirit Lk. **Ore:** Unknown. **Gangue:** Calcite, breccia. **Deposit:** Fault zone varies from a thin seam to 2 ft. in width. No mineralization observed. Country rock is andesite. **Dev:** 200-ft. drift. **Ref:** 158.

Box Canyon

Loc: Sec. 16, (10-6E), Mt. St. Helens dist. **Ore:** Unknown. **Ref:** 158.

Chicago and Golden Crown (6)

Loc: SW $\frac{1}{4}$ sec. 11, (10-6E), Mt. St. Helens dist. **Ore:** Unknown. **Ref:** 158.

Copper King

Loc: Washougal dist. **Owner:** Washougal Gold & Copper Mining Co. (1916). **Ore:** Unknown. **Ref:** 105, 1916, pp. 744-745.

Denmark (3)

Loc: SW $\frac{1}{4}$ sec. 31, (10-6E), Mt. St. Helens dist. **Owner:** Mt. St. Helens Consolidated Mining Co. (1907-1926). **Ore:** Unknown. **Ref:** 33, 1907, p. 800; 1908, p. 952. 98, 1920-1926.

Dixie

Loc: Washougal dist. **Owner:** Washougal Gold & Copper Mining Co. (1916). **Ore:** Unknown. **Ref:** 105, 1916, pp. 744-745.

Golden Crown

(see Chicago and Golden Crown)

Hercules (2)

Loc: SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 23, (9-5E), Mt. St. Helens dist. **Elev:** 3,500 ft. **Access:** 1 mi. by road and trail from Spirit Lk. Ranger Station. **Ore:** Unknown. **Ore min:** Pyrite. **Deposit:** Disseminated pyrite in felsite, andesite, and basalt. **Dev:** 185-ft. adit. **Ref:** 158.

Tennessee (4)

Loc: Across Green R. from Polar Star mine, probably in sec. 18, (10-6E), Mt. St. Helens dist. **Access:** Trail. **Ore:** Unknown. **Dev:** 105-ft. adit. **Ref:** 158.

Washington

Loc: Near Norway Pass, Mt. St. Helens dist. **Ore:** Unknown. **Deposit:** Said to be a well-defined vein. **Dev:** 50-ft. adit. **Ref:** 88, p. 97.

Williams (7)

Loc: W $\frac{1}{2}$ NW $\frac{1}{4}$ sec. 25, (8-9E), Mt. St. Helens dist. **Ore:** Unknown. **Deposit:** Adit in porphyritic andesite and volcanic breccia. No visible ore minerals. **Dev:** 500- to 600-ft. adit. **Ref:** 158.

SNOHOMISH COUNTY**Alki and Ellen (22)**

Loc: Sec. 31, (29-11E), Silver Cr. dist. **Ore:** Unknown. **Ore min:** Pyrite. **Deposit:** Vein 8 to 10 ft. wide. **Dev:** 60-ft. cross-cut. **Ref:** 14, p. 29. 63, p. 30.

Arkansas Traveler (23)

Loc: On E. side of Silver Cr. near Jumbo prospect. **Ore:** Unknown. **Ref:** 13, p. 204. 14, p. 29.

Baby Lode (4)

Loc: Near Arlington prospect, Silverton dist. **Ore:** Unknown. **Deposit:** 6-ft. vein parallel with the Arlington vein and carrying some ore. **Dev:** Short adit. **Ref:** 14, p. 40. 63, p. 22.

Beeman

Loc: Darrington dist. **Ore:** Unknown. **Ref:** 104, 2/28/37, p. 28.

Bengal (15)

Loc: Sec. 13, (29-11E), Monte Cristo dist. **Ore:** Unknown. **Ref:** 158.

Beta (9)

Loc: Sec. 31, (30-10E). **Prop:** 1 patented claim. **Owner:** Merchants Loan & Trust Co., Chicago, Ill. (1899). **Ore:** Unknown. **Ref:** 158.

Black Diamond

Loc: Silver Cr. dist. **Ore:** Unknown. **Dev:** Small amount. **Ref:** 13, p. 199. 14, p. 29.

Black Hawk (5)

Loc: Sec. 11, (30-9E), Stilaguamish dist. **Owner:** D. A. Allen, Everett, Wash. **Ore:** Unknown. **Ref:** 158.

Blackjack

(see Waterfall and Blackjack)

Boulder (10)

Loc: Secs. 2 and 11, (29-9E). **Prop:** 5 patented claims. **Owner:** Snohomish County. **Ore:** Unknown. **Ref:** 158.

Buncombe (30)

Loc: Secs. 2 and 11, (27-8E). **Prop:** 1 patented claim. **Owner:** Snohomish County. **Ore:** Unknown. **Ref:** 158.

Bunker Hill (3)

Loc: Sec. 7, (30-10E), Stilaguamish dist. **Owner:** David A. Alden and D. A. Ford, Everett, Wash. **Ore:** Unknown. **Ref:** 63, p. 21. 158.

Butte (24)

Loc: Sec. 32, (29-11E), Silver Cr. dist. **Owner:** Florence Rae Mining Co. **Ore:** Unknown. **Ref:** 158.

Cariboo

Loc: Silver Cr. dist. **Prop:** 1 patented claim. **Owner:** Mrs. Anna Antonio and Mrs. Josephine Lombardine, Seattle, Wash. (1909). **Ore:** Unknown. **Ref:** 158.

Cedar (11)

Loc: Sec. 5, (29-10E), Stilaguamish dist. **Prop:** 1 patented claim. **Owner:** Merchants Loan & Trust Co., Chicago, Ill. (1899). **Ore:** Unknown. **Ref:** 158.

Central Fraction

Loc: Monte Cristo dist. **Ore:** Unknown. **Ref:** 13, p. 188. 14, p. 22.

Clara (16)

Loc: Sec. 23, (29-11E), Monte Cristo dist. **Owner:** Ethel M. Birney, Everett, Wash. **Ore:** Unknown. **Ref:** 158.

Climax

Loc: Monte Cristo dist. Ore: Unknown. Ref: 14, p. 23.

Climax and Knoxville

Loc: On E. side of Deer Cr., Silverton dist. Ore: Unknown. Ref: 14, p. 42. 63, p. 21.

Columbus (12)

Loc: Sec. 33, (30-10E), on the S. side of Hall Peak, Sultan dist. Prop: 4 claims. Ore: Unknown. Dev: Short adit. Ref: 14, p. 47. 63, p. 24.

Columbus (33)

Loc: Sec. 34, (28-10E), Monte Cristo dist. Prop: 1 patented claim. Owner: Warren Copper Co., Seattle, Wash. Ore: Unknown. Ref: 158.

Combination (29)

Loc: Sec. 33, (29-11E), Silver Cr. dist. Ore: Unknown. Deposit: 2-ft. vein with 1 ft. of ore. Ref: 14, p. 30. 63, p. 29.

Concord (35)

Loc: Sec. 12, (27-11E), on Beckler R. Prop: 1 patented claim. Owner: National Bank of Commerce, Seattle, Wash. Ore: Unknown. Ref: 158.

Congress (19)

Loc: Sec. 22, (29-11E), Monte Cristo dist. Prop: 1 patented claim. Owner: Florence Rae Mining Co., Seattle, Wash. Ore: Unknown. Ref: 158.

Copper Bullion (34)

Loc: Sec. 7, (27-11E), Index dist. Owner: G. W. Adamson, Everett, Wash. Ore: Unknown. Ref: 158.

Copper Matte (31)

Loc: Secs. 2 and 11, (27-9E). Prop: 1 patented claim. Owner: Snohomish County. Ore: Unknown. Ref: 158.

Dena

Loc: Darrington dist. Ore: Unknown. Ref: 104, 2/28/37, p. 28.

Doubtful (6)

Loc: About 2 mi. NW. of Silverton, adjacent to the Baby Lode prospect. Ore: Unknown. Deposit: Extension of the Baby Lode vein. Ref: 14, p. 43. 63, p. 22.

Dutchman

Loc: T. 29 N., R. 11 E., on Silver Tip Mtn., Silver Cr. dist. Ore: Unknown. Deposit: 4- to 5-ft. vein of ore. Dev: 20-ft. adit. Ref: 14, p. 31. 63, p. 28.

Echo (32)

Loc: Secs. 2 and 11, (27-9E). Prop: 1 patented claim. Owner: Snohomish County. Ore: Unknown. Ref: 158.

Ellen

(see Alki and Ellen)

Emma

Loc: Silver Cr. dist. Ore: Unknown. Ref: 13, p. 200.

Even Up

Loc: Silver Cr. dist. Ore: Unknown. Dev: Small amount. Ref: 13, p. 158. 14, p. 31.

Fanny

Loc: Silver Cr. dist. Ore: Unknown. Deposit: 10-ft. shear zone with 22 in. of ore. Assays: \$25 per ton. Ref: 14, p. 32.

Forty-Seven

Loc: Index dist. Ore: Unknown. Ref: 88, p. 82.

Frater

Loc: Silver Cr. dist. Ore: Unknown. Dev: Small amount. Ref: 14, p. 32.

G. H. and L.

Loc: Darrington dist. Ore: Unknown. Ref: 104, 2/28/37, p. 28.

Galena Copper

Loc: Index dist. Ore: Unknown. Ref: 114, no. 4, 1907, p. 55.

Glacier

Loc: On W. side of '76 Basin, Monte Cristo dist. Ore: Unknown. Ref: 14, p. 23.

Great Republic

Loc: Silver Cr. dist. Ore: Unknown. Deposit: 9 ft. of concentrating ore. Ref: 13, p. 163. 14, p. 32.

Gustafson

Loc: Darrington dist. Ore: Unknown. Ref: 104, 2/28/37, p. 28.

Homestake

Loc: Monte Cristo dist. Ore: Unknown. Ref: 14, p. 23.

Hunter

Loc: Near Goat Lk., Monte Cristo dist. Ore: Unknown. Deposit: Small paystreaks of ore. Ref: 14, p. 23. 63, p. 16.

Hydra

Loc: Monte Cristo dist. Ore: Unknown. Ref: 14, p. 23.

Ingersoll

Loc: Silver Cr. dist. Ore: Unknown. Dev: Small amount. Ref: 14, p. 33.

Justice

Loc: Darrington dist. Owner: Burns Mining Co. (1907-1918). Ore: Unknown. Ref: 33, 1907, p. 400. 98, 1918, p. 62.

Knoxville

(see Climax and Knoxville)

Laborum

Loc: Monte Cristo dist. Ore: Unknown. Ref: 13, p. 150. 14, p. 24.

Lone Jack

Loc: Silverton dist. Ore: Unknown. Ref: 158.

Louise

(see Mayflower and Louise)

Lucky Chance

Loc: Silverton dist. Ore: Unknown. Ref: 158.

Mammoth

Loc: Index dist. Ore: Unknown. Ref: 88, p. 82.

Marine (25)

Loc: On E. side of Silver Cr. near Jumbo property. Ore: Unknown. Ref: 14, p. 34.

Mayflower and Louise

Loc: On the Four Aces vein in Silverton dist. Ore: Unknown. Ref: 14, p. 44.

Moss Rose

Loc: Silverton dist. Ore: Unknown. Ref: 158.

Navajo

Loc: ½ mi. NE. of Goat Lk., Monte Cristo dist. **Prop:** 3 claims. **Ore:** Unknown. **Deposit:** 1 mineralized fracture zone with good ore. **Ref:** 14, p. 24, 63, p. 16.

Nibus

Loc: Monte Cristo dist. **Ore:** Unknown. **Ref:** 14, p. 24.

Noaday

Loc: Darrington dist. **Ore:** Unknown. **Ref:** 104, 2/28/37, p. 28.

Non Pareil (2)

Loc: Near Helena mine N. of Deer Lk., Silverton dist. **Prop:** 2 claims. **Ore:** Unknown. **Deposit:** 8- to 12-ft. vein. **Ref:** 14, p. 45. 63, p. 20.

Old Missouri (26)

Loc: On E. side of Silver Cr. near Jumbo prospect. **Ore:** Unknown. **Ref:** 14, p. 36.

Pauline (20)

Loc: Sec. 16, (29-11E), on N. side of valley on E. side of Purcell Cr. **Elev:** 2,500 ft. **Prop:** 1 claim. **Owner:** Pauline Elster (1942). **Ore:** Unknown. **Ore min:** Pyrite. **Gangue:** Quartz, calcite. **Deposit:** Fracture zone about 3 ft. wide is weakly mineralized. Large area of oxidized silica-pyrite ore higher up the mountain. **Dev:** 200-ft. adit. **Ref:** 158.

Phoenix (21)

Loc: On E. side of the Rainy property, Monte Cristo dist. **Ore:** Unknown. **Dev:** Small amount. **Ref:** 14, p. 24.

Pinnacle

Loc: Monte Cristo dist. **Ore:** Unknown. **Ref:** 13, p. 149.

Pomona

Loc: Snohomish County. **Owner:** Miners Smelting & Refining Co. (1934). **Ore:** Unknown. **Ref:** 104, 4/30/34, pp. 21-22.

Port Gardner

Loc: Silver Cr. dist. **Ore:** Unknown. **Dev:** Small amount. **Ref:** 13, p. 158. 14, p. 36.

Ranger

Loc: Monte Cristo dist. **Ore:** Unknown. **Ref:** 13, p. 149.

Russia

Loc: Monte Cristo dist. **Ore:** Unknown. **Ref:** 14, p. 25.

Sacramento (14)

Loc: Adjacent to the Sunset property 1 mi. S. of Goat Lk., Monte Cristo dist. **Ore:** Unknown. **Ref:** 14, p. 25. 63, p. 16.

San Francisco (17)

Loc: Sec. 13, (29-11E), 1 mi. S. of Goat Lk., Monte Cristo dist. **Ore:** Unknown. **Deposit:** 10- to 12-ft. mineralized fracture zone. **Dev:** Short adit. **Ref:** 14, p. 25. 63, p. 16.

Saturday

Loc: Monte Cristo dist. **Ore:** Unknown. **Ref:** 14, p. 25.

Scotch Lassie Jean (27)

Loc: On E. side of Silver Cr. near the Jumbo property. **Ore:** Unknown. **Ref:** 14, p. 36.

Seventy-Four

Loc: Monte Cristo dist. **Ore:** Unknown. **Ref:** 13, p. 150.

Shamrock Copper

Loc: Sultan dist. **Owner:** Blackman Bros., Inc. (1915). **Ore:** Unknown. **Ref:** 158.

Silver Shield

Loc: Silver Cr. dist. **Ore:** Unknown. **Ref:** 13, p. 161.

Stockton

Loc: Near the mouth of Deer Cr., Silverton dist. **Prop:** 4 claims. **Ore:** Unknown. **Deposit:** Probably an extension of the Bonanza Queen vein. **Dev:** Several adits, one 31 ft. long. **Ref:** 14, p. 45. 63, p. 20.

Stratus

Loc: Monte Cristo dist. **Ore:** Unknown. **Ref:** 14, p. 25.

Summer Coon (8)

Loc: Sec. 20, (30-10E), near Cleveland prospect, Silverton dist. **Ore:** Unknown. **Deposit:** Probably an extension of the Cleveland vein. **Ref:** 14, p. 45. 63, p. 18.

Superior

Loc: Silver Cr. dist. **Ore:** Unknown. **Ore min:** Pyrite. **Deposit:** 10-ft. shear zone. **Ref:** 14, p. 37.

Thistle

Loc: Silverton dist. **Ore:** Unknown. **Ref:** 158.

Three Sisters (7)

Loc: Sec. 2, (30-9E), just across the divide between Martin and Deer Creeks, Silverton dist. **Prop:** 4 claims. **Ore:** Unknown. **Deposit:** 18 in. of ore. **Dev:** 20-ft. adit. **Ref:** 14, p. 45. 63, p. 20.

Trident

Loc: Index dist. **Ore:** Unknown. **Ref:** 88, p. 82.

Tuscolusa

Loc: Monte Cristo dist. **Ore:** Unknown. **Ref:** 13, p. 150. 14, p. 26.

Uncle Sam

Loc: On W. side of '76 Basin, Monte Cristo dist. **Ore:** Unknown. **Ref:** 14, p. 26.

Washington

Loc: Monte Cristo dist. **Ore:** Unknown. **Ref:** 14, p. 26.

Waterfall and Blackjack (18)

Loc: Sec. 13, (29-11E), 1 mi. S. of Goat Lk., Monte Cristo dist. **Ore:** Unknown. **Deposit:** Two 5-ft. fracture zones carrying from 1½ to 4 ft. of ore. **Ref:** 14, p. 26. 63, p. 16.

Welcome Home (13)

Loc: Sec. 12, (29-10E), at head of Stilaguamish R. **Owner:** Homer Manley. **Ore:** Unknown. **Ore min:** Minor sulfides. **Deposit:** Country rock is argillite and conglomerate. A poor showing. **Dev:** Shaft. **Ref:** 158.

West Seattle

Loc: Monte Cristo dist. **Ore:** Unknown. **Ref:** 14, p. 26.

Wildcat (28)

Loc: Sec. 25, (29-11E), Monte Cristo dist. **Ore:** Unknown. **Ref:** 14, p. 26.

Witcher (1)

Loc: NE¼ sec. 29, (32-9E), at foot of White Horse Mtn., Darrington dist. **Owner:** D. A. Witcher, Darrington, Wash. **Ore:** Unknown. **Ore min:** Pyrite. **Deposit:** Small quartz veinlets in argillite. **Dev:** 3 adits: 35 ft., 25 ft., and 8 ft. long. **Ref:** 14, p. 11.

STEVENS COUNTY**Alberta**

Loc: Chewelah dist. **Owner:** Chewelah Copper Mining and Smelting Co. (1907). **Ore:** Unknown. **Ref:** 98, 1907, p. 476. 116, no. 10, 1907, p. 18.

Alice Mae (11)

Loc: SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 35, (39-39E), about 1,000 ft. E. of the Wall Street property, Northport dist. **Ore:** Unknown. **One min:** Pyrite, pyrrhotite. **Deposit:** Quartz vein in argillite contains some pyrite and pyrrhotite. **Dev:** Inaccessible shaft. **Ref:** 158.

Big Bear

Loc: Orient dist. **Ore:** Unknown. **Prod:** 1915. **Ref:** 158.

Bromide Mountain

Loc: Northport dist. **Owner:** Bromide Mountain Mining Co. (1930-1936). **Ore:** Unknown. **Ref:** 104, 4/15/30, p. 27; 4/15/36, p. 27.

Brown Bear (19)

Loc: Sec. 3, (30-38E), Cedar Canyon dist. **Ore:** Unknown. **Ref:** 106, 10/1/31, p. 14.

Buck Canyon (14)

Loc: SW $\frac{1}{4}$ sec. 19, (32-40E), in Buck Canyon, $\frac{3}{4}$ mi. NW. of the Imperial Copper property. **Access:** $\frac{1}{4}$ mi. from the end of Buck Canyon road. **Ore:** Unknown. **Deposit:** Both workings in slate and phyllite. A few quartz-calcite stringers but no ore minerals. **Dev:** 235-ft. adit and 130-ft. adit. **Ref:** 158.

Bulldog

Loc: Chewelah dist. **Ore:** Unknown. **Ref:** 105, 4/92, p. 299.

Butte

(see Chief and Butte)

Butte and Washington

Loc: Orient dist. **Ore:** Unknown. **Ref:** 114, no. 5, 1909, p. 62.

C & A

Loc: Colville area. **Owner:** Bruce Creek Mines Co. (1918-1922). **Ore:** Unknown. **Ref:** 98, 1922, p. 1636; 1925, p. 1807, 112, p. 171.

Calumet and Hecla (12)

Loc: NW. cor. sec. 29, (38-41E), Northport dist. **Owner:** Aladdin Mines Co. (1933). National Mining Co. (1908-1918). **Ore:** Unknown. **Ref:** 116, no. 2, 1908, p. 26.

Carr

Loc: Chewelah dist. **Ore:** Unknown. **Ref:** 104, 1/15/36, p. 26.

Chicamun

Loc: Orient dist. **Owner:** Chicago Gold Mining & Milling Co. (1908-1918). **Ore:** Unknown. **Ref:** 112, p. 191, 114, no. 5, 1909, p. 59.

Chief and Butte (4)

Loc: Sec. 16, (39-37E), Orient dist. **Ore:** Unknown. **Ref:** 114, no. 5, 1909, p. 60. 158.

Coffin

Loc: Northport dist. **Owner:** West Kootenay Mining Co. (1930). **Ore:** Unknown. **Ref:** 106, 1/2/30; 3/5/31, p. 19; 4/2/31.

Commonwealth

Loc: Orient dist. **Owner:** Pierre Lake Gold & Copper Co. (1915). **Ore:** Unknown. **Ref:** 158.

Cultis

Loc: Orient dist. **Owner:** Bonus Gold Mining & Milling Co. (1915). **Ore:** Unknown. **Ref:** 158.

Dandy

Loc: Bossburg dist. **Ore:** Unknown. **Ref:** 13, p. 153.

David Harum (5)

Loc: Sec. 19, (39-38E). **Ore:** Unknown. **Ref:** 164, p. 150.

Drake

Loc: Chewelah dist. **Owner:** Wizard Mining Co. (1908-1918). **Ore:** Unknown. **Ref:** 98, 1918, p. 148. 116, no. 6, 1908, p. 123.

Edwin Seaman (15)

Loc: Sec. 31, (32-40E), Springdale area. **Owner:** Western Premier Mining Co. (1929-1930). **Ore:** Unknown. **Ref:** 106, 10/1/29; 4/17/30.

Effie R.

Loc: Orient dist. **Owner:** Bonus Mining & Milling Co. (1915). **Ore:** Unknown. **Ref:** 158.

Fool's Luck

Loc: Northport dist. **Ore:** Unknown. **Ref:** 106, 7/16/31, p. 17.

Fraction

Loc: Bossburg dist. **Ore:** Unknown. **Ref:** 13, p. 127.

Hartbauer (9)

Loc: Sec. 36, (40-41E), Northport dist. **Access:** Near road. **Prop:** 40-acre lease of State land. **Owner:** Carl Hartbauer, lessee (1941). **Ore:** Unknown. **Deposit:** Mineralized fracture zone has been traced 150 ft. on the surface. **Dev:** 35 ft. of work in 2 shafts; also some open cuts. **Ref:** 30, p. 102.

Hecla

(see Calumet and Hecla)

Iron Chief

Loc: Cedar Canyon dist. **Ore:** Unknown. **Ref:** 158.

Last Chance

Loc: Marcus dist. **Ore:** Unknown. **Ref:** 158.

Lion

Loc: Bossburg area. **Ore:** Unknown. **Ref:** 158.

Log Cabin (6)

Loc: S. of Blue Bird property, sec. 19, (39-38E). **Ore:** Unknown. **Ref:** 164, p. 150.

Lost Boy

Loc: Colville dist. **Ore:** Unknown. **Ref:** 158.

Lucky Bill

Loc: Northport dist. **Ore:** Unknown. **Ref:** 105, 2/16/07, p. 201.

Lucky Red

Loc: Orient dist. **Owner:** Bonus Gold Mining & Milling Co. (1915). **Ore:** Unknown. **Ref:** 158.

Lucky Strike (10)

Loc: Sec. 18, (39-42E), Northport dist. **Ore:** Unknown. **Prod:** 1934. **Ref:** 97, 1935, p. 355.

Mammoth

Loc: Marcus area. **Ore:** Unknown. **Ref:** 158.

Minnehaha

Loc: Bossburg dist. **Ore:** Unknown. **Prod:** 2 tons (1924). **Ref:** 106, no. 18, 1924, p. 8.

Monohan (7)

Loc: SW $\frac{1}{4}$ sec. 18, (32-40E), at head of Buck Canyon. **Elev:** 2,820 ft. **Access:** Road near the property. **Prop:** Several claims. **Owner:** Charles Gilbert (1941). **Ore:** Unknown. **Deposit:** Country rock is quartzite, argillite, and limestone. No vein or ore exposed. **Dev:** 885-ft. adit, 250-ft. adit. **Ref:** 30, p. 45, 164, p. 187.

Old National

Loc: Cedar Canyon dist. **Owner:** Old National Mining Co. (1915). **Ore:** Unknown. **Ref:** 158.

Princess Pat (3)

Loc: Sec. 7, (39-37E), joins First Thought mine on the N., Orient dist. **Access:** ¼ mi. from road. **Prop:** 3 unpatented claims. **Owner:** Mrs. Terry, Orient, Wash. (1941). **Ore:** Unknown. **Deposit:** No sign of ore. Work was done in hope of uncovering an extension of the First Thought ore. **Dev:** 500 ft. of work in 5 adits and a 100-ft. shaft. **Ref:** 30, p. 125.

Prudential

Loc: Bossburg dist. **Ore:** Unknown. **Ref:** 158.

Ranger

Loc: Bossburg dist. **Ore:** Unknown. **Ref:** 13, p. 127.

San Jose

Loc: Orient dist. **Ore:** Unknown. **Ref:** 158.

Santiago

Loc: Kettle Falls dist. **Owner:** Mingo Mining Co. (1915). **Ore:** Unknown. **Ref:** 158.

Skookum (16)

Loc: Sec. 31, (32-40E), Valley dist. **Owner:** Western Premier Mining Co. (1929-1930). **Ore:** Unknown. **Ref:** 106, 10/1/29; 4/17/30.

Strobeck (13)

Loc: Sec. 30, (33-41E), Chewelah dist. **Ore:** Unknown. **Gangue:** Quartz, calcite. **Deposit:** Wall rock is schist, limy shales, and a kersantite dike. **Ref:** 7, pp. 104-105.

Tenderfoot (1)

Loc: Sec. 15, (40-37E), Orient dist. **Owner:** P. W. O'Brien (1909). **Ore:** Unknown. **Ref:** 114, no. 5, 1909, p. 60.

Treadwell (2)

Loc: Orient dist., E. of Yellow Jacket property. **Prop:** 2 claims: Treadwell Nos. 1 and 2. **Ore:** Unknown. **Ore min:** Pyrite. **Gangue:** Calcite. **Deposit:** Fracture zone in limestone is brecciated, silicified, and slightly mineralized. **Dev:** 18-ft. shaft, open cuts. **Ref:** 164, p. 282.

Uncle Sam (17)

Loc: Sec. 29, (32-40E), in Buck Canyon. **Prop:** Deeded timber land. **Owner:** Messrs. Kulzer and Woodbury, Valley, Wash. (1941). **Ore:** Unknown. **Ore min:** Pyrite. **Deposit:** Scattered cubes of pyrite in argillite. No vein or ore exposed. **Dev:** 50-ft. adit. **Ref:** 30, p. 45. 164, p. 188.

Union (8)

Loc: Sec. 3, (40-39E), Northport dist. **Ore:** Unknown. **Ref:** 158.

Velvet

Loc: Northport dist. **Ore:** Unknown. **Prod:** Shipped conc. to smelter in 1939. **Ref:** 108, 7/39, p. 22.

Washington (18)

Loc: Sec. 29, (32-40E), Chewelah dist. **Elev:** 2,350 ft. **Ore:** Unknown. **Deposit:** A barren 6-in. quartz vein parallel to laminations in argillite. No ore exposed. **Dev:** 415 ft. of adit. **Ref:** 164, pp. 187-188.

Washington (Butte and Washington)
(see Butte and Washington)**Wizard**

Loc: Chewelah dist. **Ore:** Unknown. **Ref:** 114, no. 5, 1909 p. 58.

WHATCOM COUNTY**Blue Hen**

Loc: Slate Cr. dist. **Owner:** Cascadian Engineering Corp. (1932). **Ore:** Unknown. **Ref:** 106, 7/7/32, p. 14.

Chandelar (2)

Loc: At junction of Dickey and Slate Creeks. **Access:** 5 mi. W. of Harts Pass by road. **Prop:** 1 claim. **Owner:** Messrs. Charles Willman and Kenney (1943). **Ore:** Unknown. **Deposit:** Hydrothermal alteration along a joint in arkosic sandstone. Band of alteration only 1 in. wide and contains no ore minerals. **Ref:** 158.

Clear Water

Loc: Mt. Baker dist. **Prop:** 1 patented claim. **Ore:** Unknown. **Ref:** 158.

Copper Mountain

Loc: Whatcom County. **Ore:** Unknown. **Ref:** 114, no. 5, 1909.

Mill Creek

Loc: Slate Cr. dist. **Ore:** Unknown. **Ref:** 114, no. 2, 1906, p. 22; no. 5, 1909.

Miller

(see Newton and Miller)

Mountain Top

Loc: Slate Cr. dist. **Ore:** Unknown. **Prod:** 1909. **Ref:** 158.

Newton and Miller (1)

Loc: Near W. ¼ cor. sec. 2, (39-7E), on S. side of Nooksack R. **Owner:** Messrs. Newton and Miller, Bellingham, Wash. (1938). **Ore:** Unknown. **Ore min:** None. **Deposit:** Small barren quartz veinlets and gouge seams in fossiliferous shales and sandstones. **Dev:** 200-ft. adit with several short drifts and crosscuts. Reportedly 2 other adits. **Ref:** 158.

Swift Creek

Loc: Mt. Baker dist. **Owner:** Swift Creek Mining Co. (1915). **Ore:** Unknown. **Ref:** 158.

YAKIMA COUNTY**Bob's Mine (1)**

Loc: Secs. 4 and 5, (17-11E), Summit dist. **Owner:** Gold Links Mining Co. (1939). **Ore:** Unknown. **Ref:** 158.

Ivanhoe

Loc: Yakima County. **Owner:** Ivanhoe Mining Co. **Ore:** Unknown. **Ref:** 105, no. 17, 1907, p. 522.

Welcome

Loc: Summit dist. **Ore:** Unknown. **Ref:** 58, p. 72.

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