

Preliminary Table of Classification for British Columbia Ore-Shoots.

Temperature (in degrees Centigrade).	Pressure (in atmospheres).	Type of ore-shoot.	Type localities in British Columbia.		Mineralogy.		Petrology and structure.		Age of mineralization.	Characteristics of shoots and criteria for recognition.	References to literature.
			Mine or occurrence.	District.	Ores.	Gangues.	Intruded rock.	Intrusive.			
700 to 1,500.	Very high.	I. MAGMATIC SEGREGATION SHOOTS. Chromite chiefly in "pockets."	Taylor basin.	Tulameen Lillooet.	Chromite containing microscopic diamonds.	Serpentine, olivine, asbestos.	Cadwallader series.	Peridotite sill.	Jura-Cretaceous.	1. Simplicity of mineralogy. 2. Gradation of ore into femic igneous rock. 3. Absence of pneumatolytic minerals. 4. Igneous component minerals. 5. Rariness of minerals produced by thermal alteration, such as sericite, quartz, carbonates, etc. 6. Relation of component grains which indicate early crystallization.	Geol. Surv., Can., Mem. 26, 1913, pp. 168-170. Geol. Surv., Can., Sum. Rept., 1915, p. 83.
		Sulphides of copper in "bunches" or "nests."	"Blacklead" properties.	Franklin.	Chalcopyrite and bornite.	Orthoclase feldspar, augite, magnetite.		Shonkinite-pyroxenite chonolith.	Miocene.		Geol. Surv., Can., Mem. 56, 1915, pp. 172-174.
300 ± to 800.	Very high.	II. IGNEOUS METAMORPHIC SHOOTS. Igneous replacement shoots not related to contacts.	Granby and B.C. Copper Co. mines.	Phoenix and Deadwood.	Chalcopyrite, magnetite, specularite, pyrite, rarely bornite and sphalerite.	Garnet, epidote, calcite, actinolite, chlorite.	Upper Palaeozoic crystalline limestone.	Granodiorite batholith.	Late Jurassic.	1. Massive sulphides and oxides in lime silicate gangues. 2. Irregular shape, size, and distribution of shoots. 3. Inclusions of lime. 4. Influence of minute fractures and slips. 5. Shrinkage cracks and vugs filled with calcite crystals. 6. Absence of structural walls.	Geol. Surv., Can., Mem. 21, 1912, pp. 53-70. Geol. Surv., Can., Mem. 19, 1913, pp. 32-40.
		Contact metamorphic shoots.	Marble Bay.	Texada island.	Chalcopyrite, bornite, molybdenite, native silver.	Garnet, diopside, tremolite, epidote, calcite.	Palaeozoic limestone (pure).	Diorite porphyrite dykes and stocks of quartz diorite.	Late Jurassic.		Geol. Surv., Can., Mem. 58, 1915, pp. 44-56.
			Nickel Plate.	Hedley.	Arsenopyrite, pyrrhotite, chalcopyrite, sphalerite, and pyrite.	Calcite, garnet, epidote, pyroxene, quartz, amphibole.	Banded and impure Palaeozoic limestones.	Diorite-gabbro.	Early Mesozoic.		Geol. Surv., Can., Mem. 2, 1910, pp. 130-180.
		Pneumatolytic shoots.	Molly.	Salmo.	Molybdenite and molybdate.	Pyrite, epidote, orthoclase, kaolin, quartz, mica.	Pend-d'Oreille schists and limestone.	Quartzose biotite granite.	Late Jurassic.	1. Associated with pegmatite dykes or vitreous quartz veinlets. 2. Connected with jointing systems in quartzose granite near upper border of cupola stock.	Trans. Can. Min. Inst., vol. XVIII, 1915, pp. 247-255. Geol. Surv., Can., Sum. Rept., 1916 (in preparation) for description of similar occurrence.
300 ± to 500 ±.	Very high.	III. SHOOTS OF ASCENDING CIRCULATION. Deposition and localization— a. At great depth—"shoots of variation." 1. Due to chemical effect of wall rock. 2. Due to intersecting veins. 3. Due to dyke intersections. 4. Due to impounding of mineralizing solutions. 5. Due to chemical reaction.	Centre Star, War Eagle, Le Roi, and Josie groups of mines.	Rossland.	Chalcopyrite, pyrrhotite, pyrite, with gold and silver values.	Silicified and biotitized country rock with chlorite, calcite, garnet, and quartz.	Augite porphyrite sills.	Stocks and tongues of granodiorite and diorite porphyrite.	Late Jurassic and Miocene.	1. Lode deposits—replacement shoots along shear zones. 2. Influence of country rocks very great in localization of ore-shoots, character of ore, and trend and dip of veins. 3. Intense alteration of wall rocks with their silicification, biotitization, and chloritization. 4. Close connexion with cupola stocks, and tongues of granodiorite and diorite porphyrite. 5. Presence here and there of garnet.	Geol. Surv., Can., Mem. 77, 1915, pp. 58-62.
150 ± to 300 ±.	High (140-400).	b. At intermediate depth—"shoots of occurrence" (say 4,000 to 12,000 feet below the surface). 1. Due to available open space and physical character of wall rock.	Coronation and other gold mines.	Lillooet.	Free gold, pyrite, arsenopyrite.	Ribbed quartz.	Cadwallader series.	Augite diorite and granodiorite.	Late Jurassic.	1. Regularity of fissuring. 2. Free gold in quartz gangue filling fissure dominant type. 3. Faulting along vein fissures common with slickensides and gouge as well as step faulting along formational planes with formation of crevasse fissures and 'stock works'.	Geol. Surv., Can., Sum. Rept., 1912, pp. 194-208. Geol. Surv., Can., Sum. Rept., 1915, pp. 80-85. Mem. in preparation.
		2. Due to chemical effect of wall rock including "blanket shoots" (replacement).	No. 1 mine, Lucky Jim, Galena Farm, Wakefield, Sullivan, and other lead-zinc mines.	Ainsworth, Slocan and East Kootenay.	Galena, sphalerite, pyrite, native silver, and oxidized ores.	Altered limestone, argillite or quartzite.	Limestone, argillite, and quartzite.	Nelson granite.	Late Jurassic.	4. "Pinches" and "swells" characteristic of many veins. 5. Where wall rock of fissure vein is limestone, replacement is common and silver values dominate. 6. "Paystreaks" tend to follow one or the other wall.	Geol. Surv., Can., Sum. Rept., 1914, pp. 40-41. Mem. in preparation. Geol. Surv., Can., Sum. Rept., 1910, pp. 123-128.
		3. Due to intermingling of ascending and descending solutions.	Mother Lode, Queen, and other gold mines.	Sheep Creek and Ymir.	Free gold, pyrite, and galena and blende at Ymir.	Pyritic quartz (oxidized).	Summit series quartzite; Pend-d'Oreille schists at Ymir.	Nelson granite.	Late Jurassic.	7. Water courses common. 8. Close genetic connexion between master jointing and fissure vein systems.	Explanatory notes. Geol. Surv., Can., Map 1068, 1909.
		4. Due to impounding of mineralizing solutions. 5. Due to intersections.	Silver-lead mines near Sandon, and Yankee Girl and other gold mines.	Slocan and Ymir.	Galena, zinc blende, and pyrite.	Quartz, siderite.	Slocan series, Pend-d'Oreille group.	Nelson granite.	Late Jurassic.		Geol. Surv., Can., Sum. Rept., 1910, pp. 123-128. Mem. in preparation.
50 ± to 150 ±.	Less than 100.	c. At slight depth. Due to physical character of wall rock and intersections.	Reliance and Stibnite groups, Cinnabar mines.	Lillooet Kamloops.	Stibnite, cervantite, cinnabar.	Quartz, kaolin, chlorite limonite; calcite in case of cinnabar.	Bridge River metabasalt; Nicola series dolomite.	Rhyolite porphyry.	Tertiary.	1. Ore occurs in "lenses" or "pockets" lacking in continuity and regularity. 2. Associated with volcanic rocks of Tertiary age. 3. Comb structures, frozen walls, and brecciation common features.	Geol. Surv., Can., Sum. Rept., 1915, pp. 84-85.
		IV. SHOOTS OF DESCENDING CIRCULATION OR VADOSE SHOOTS.	Mines on the uplands of southern Selkirk and elsewhere.	Sheep creek and Ymir.	Limonite, native gold, cerussite, pyromorphite, native gold and silver at Ymir.				Late Tertiary and post-Glacial.	1. Characterized by horizontal extension in contrast to the predominance of the vertical direction in the primary shoots. 2. Irregularity of lower boundary of ore-shoot.	