Model 25c

DESCRIPTIVE MODEL OF COMSTOCK EPITHERMAL VEINS

By Dan L. Mosier, Donald A. Singer, and Byron R. Berger

APPROXIMATE SYNONYM Epithermal gold (quartz-adularia) alkali-chloride type.

DESCRIPTION Gold, electrum, silver sulfosalts, and argentite in vuggy quartz-adularia veins hosted by felsic to intermediate volcanic rocks that overlie predominantly elastic sedimentary rocks, and their metamorphic equivalents (see fig. 106).

GENERAL REFERENCES Buchanan (1980), Boyle (1979).

GEOLOGICAL ENVIRONMENT

Rock Types Host rocks are andesite, dacite, quartz latite, rhyodacite, rhyolite; and associated sedimentary rocks. Mineralization related to talc-alkaline or bimodal volcanism.

Textures Porphyritic.

Age Range Mainly Tertiary (most are 40-3.7 my.).

Depositional Environment Calc-alkaline and bimodal volcanism and associated intrusive activity over basement rocks composed of elastic sedimentary rocks and their metamorphic equivalents. Volcanic-related geothermal systems lack access to saline fluids from basement sources.

Tectonic Setting(s) Through-going fracture systems, major normal faults, fractures related to doming, ring fracture zones, joints.

Associated Deposit Types Placer gold and epithermal quartz-alunite Au.

DEPOSIT DESCRIPTION

Mineralogy Argentite + gold or electrum ± silver sulfosalts ± naumannite. Galena, sphalerite, chalcopyrite, tellurides, hematite, and arsenopyrite are moderate to sparse. Gangue minerals are quartz + pyrite ± adularia ± calcite ± sericite ± chlorite. Barite, fluorite, rhodochrosite, kaolinite, and montmorillonite are moderate to sparse. Ore minerals constitute only a few percent of vein.

Texture/Structure Banded veins, open space filling, lamellar quartz, stockwork.

Alteration From top to bottom of system: quartz + kaolinite + montmorillonite ± zeolite ± barite ± calcite; quartz + illite; quartz + adularia ± illite; quartz + chlorite; presence of adularia is variable.

Ore Controls Through-going anastomosing fracture systems, centers of intrusive activity. Hanging wall more favorable.

Weathering Bleached country rock, limonite, jarosite, goethite, alunite, hematite, argillization with kaolinite.

Geochemical Signature Higher in system Au + As + Sb + Hg or Au + As + Cu; Au + Ag + Pb + Cu; also Te and W.

EXAMPLES

Comstock, USNV	(Becker, 1882)
Guanajuato, MXCO	(Buchanan, 1980; Wandke and Martinez, 1928)

GRADE AND TONNAGE MODEL OF COMSTOCK EPITHERMAL VEINS

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COMMENTS See figs. 113-116.

DEPOSITS

Name	Country	Name	Country
Aurora	USNV	Ohguchi	JAPN
Bodie	USCA	Ohito	JAPN
Bovard	USNV	Olinghouse	USNV
Calico	USCA	Orient	USWA
Calistoga	USCA	Patterson	USCA
Comstock	USNV	Republic	USWA
Divide	USNV	Rosario	HNDR
Dolores	MXCO	Sand Springs	USNV
El Rincon	MXCO	Searchlight	USNV
Fairview	USNV	Seikoshi	JAPN
Fuke	JAPN	Seven Trough	USNV
Gold Mountain	USUT	Sheep Tank	USAZ
Guanacevi	MXCO	Silver City	USNV
Guanajuato	MXCO	Taio	JAPN
Hostotipaquilla	MXCO	Tayoltita	MXCO
Katherine	USAZ	Toi	JAPN
Kushikino-Arakawa	JAPN	Tonopah	USNV
Mochikoshi	JAPN	Tuscarora	USAZ
Mogollon	USNM	Weaver	USAZ
Nawaji	JAPN	Yugashima	JAPN
Oatman	USAZ		

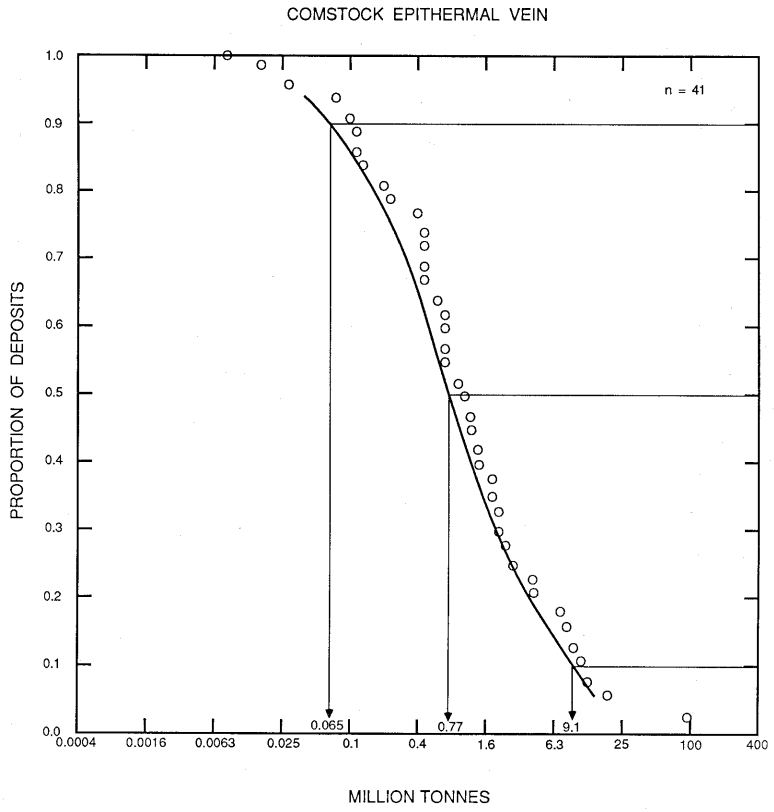

Figure 113. Tonnages of Comstock epithermal vein deposits.

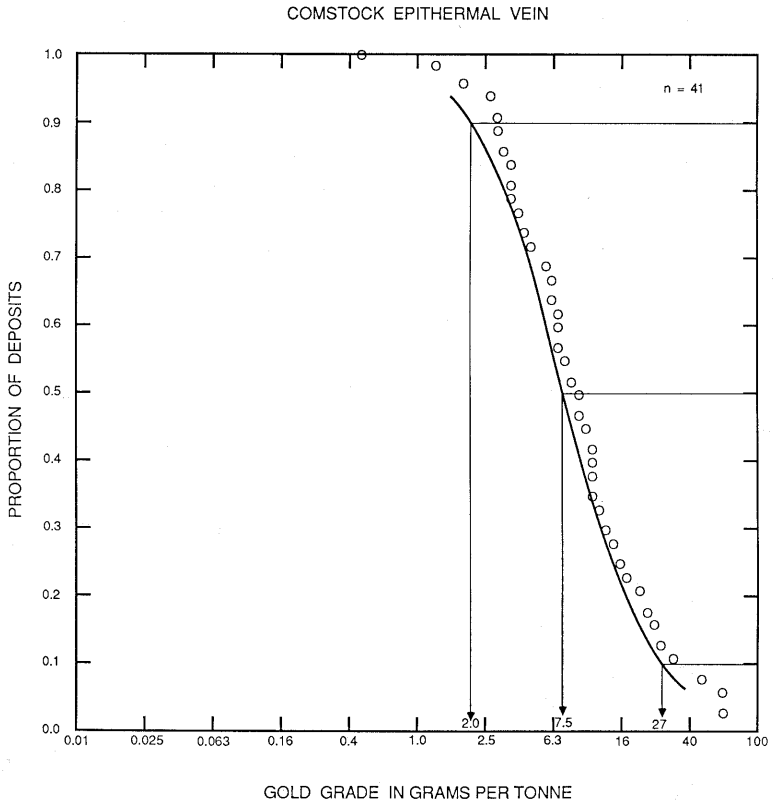

Figure 114. Gold grades of Comstock epithermal vein deposits.

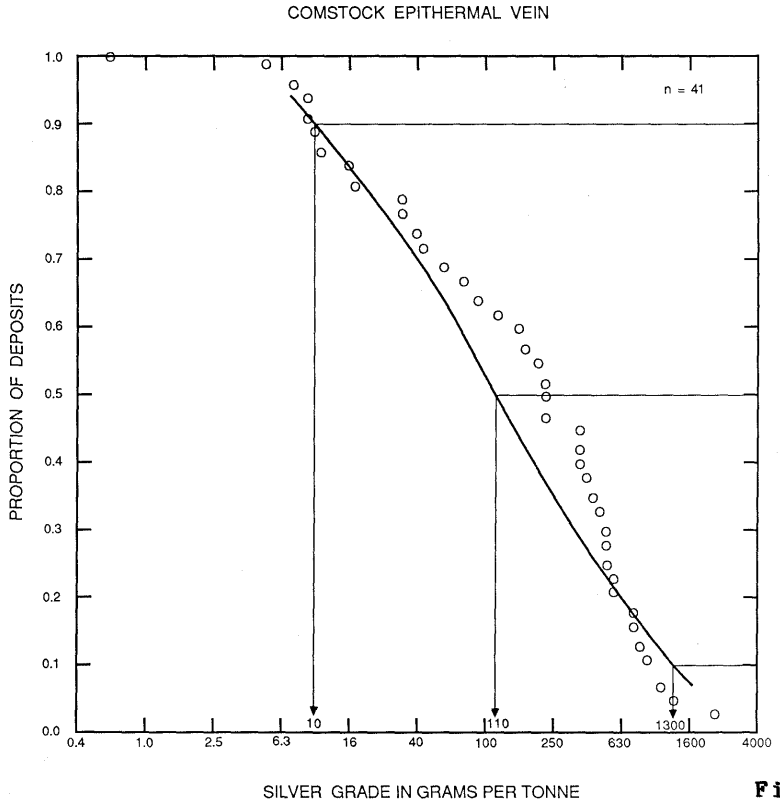

Figure 115. Silver grades of Comstock epithermal vein deposits.

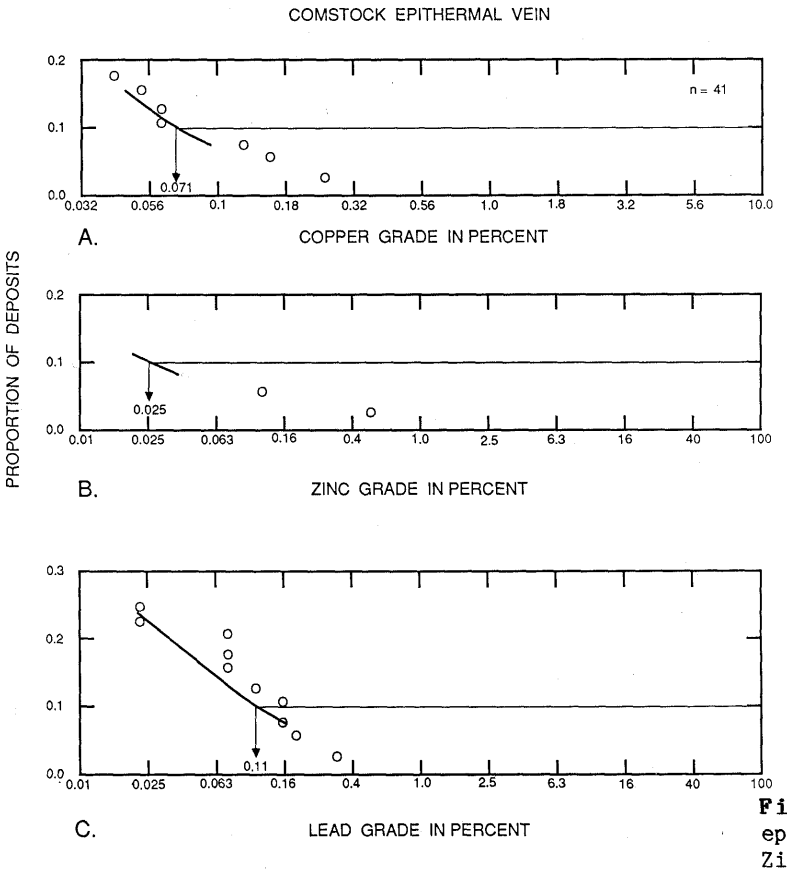

Figure 116. By-product grades of Comstock epithermal vein deposits. A, Copper. B, Zinc. C, Lead.