DESCRIPTIVE MODEL OF CARBONATE-HOSTED Au-Ag

By Byron R. Berger

APPROXIMATE SYNONYM Carlin-type or invisible gold.

DESCRIPTION Very fine grained gold and sulfides disseminated in carbonaceous calcareous rocks and associated jasperoids.

GENERAL REFERENCE Tooker (1985).

GEOLOGICAL ENVIRONMENT

Rock Types Host rocks: thin-bedded silty or argillaceous carbonaceous limestone or dolomite, commonly with carbonaceous shale. Intrusive rocks: felsic dikes.

Textures Dikes are generally porphyritic.

Age Range Mainly Tertiary, but can be any age.

Depositional Environment Best host rocks formed as carbonate turbidites in somewhat anoxic environments. Deposits formed where these are intruded by igneous rocks under nonmarine conditions.

Tectonic Setting(s) High-angle normal fault zones related to continental margin rifting.

Associated Deposit Types W-MO skarn, porphyry Mo, placer Au, stibnite-barite veins.

DEPOSIT DESCRIPTION

Mineralogy Native gold (very fine grained) + pyrite + realgar + orpiment ± arsenopyrite ± cinnabar ± fluorite ± barite ± stibnite. Quartz, calcite, carbonaceous matter.

Texture/Structure Silica replacement of carbonate. Generally less than 1 percent fine-grained sulfides.

Alteration Unoxidized ore: jasperoid + quartz + illite + kaolinite + calcite. Abundant amorphous carbon locally appears to be introduced. Hypogene oxidized ore: kaolinite + montmorillonite + illite + jarosite + alunite. Ammonium clays may be present.

Ore Controls Selective replacement of carbonaceous carbonate rocks adjacent to and along high-angle faults, or regional thrust faults or bedding.

Weathering Light-red, gray, and (or) tan oxides, light-brown to reddish-brown iron-oxide-stained jasperoid.

Geochemical Signature: Au + As + Hg + W ± Mo; As + Hg + Sb + T1 ± F (this stage superimposed on preceding); NH_3 important in some deposits.

EXAMPLES

Carlin, USNV	(Radtke and others, 1980)
Getchell, USNV	(Joralemon, 1951)
Mercur, USUT	(Gilluly, 1932)

GRADE AND TONNAGE MODEL OF CARBONATE-HOSTED Au-Ag

By William C. Bagby, W. David Menzie, Dan L. Mosier, and Donald A. Singer

COMMENTS See figs. 134-135

Model 26a--Con.

DEPOSITS

Name	Country	Name	Country
Alligator Ridge	USNV	Jerritt Canyon	USNV
Atlanta	USNV	Maggie Creek	USNV
Blue Star	USNV	Mercur	USUT
Carlin	USNV	Northumberland	USNV
Cortez	USNV	Pinson	USNV
Dee	USNV	Preble	USNV
Emigrant Springs #1	USNV	Rain	USNV
Emigrant Springs #2	USNV	Relief Canyon	USNV
Florida Canyon	USNV	Roberts Mtns. Dist.	USNV
Getchell	USNV	Santa Fe	USNV
Giltedge	USMT	Standard	USNV
Gold Bar	USNV	Toiyabe	USNV
Gold Acres	USNV	Tolman	USID
Gold Quarry	USNV	Tonkin Springs	USNV
Horse Canyon	USNV	Windfall	USNV

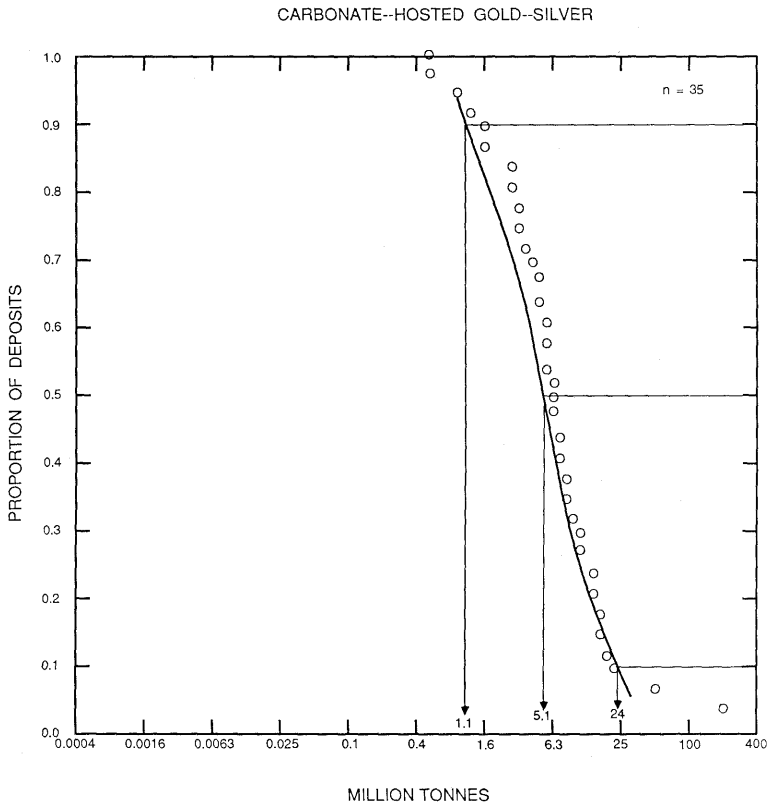

Figure 134. Tonnages of carbonate-hosted Au-Ag deposits.

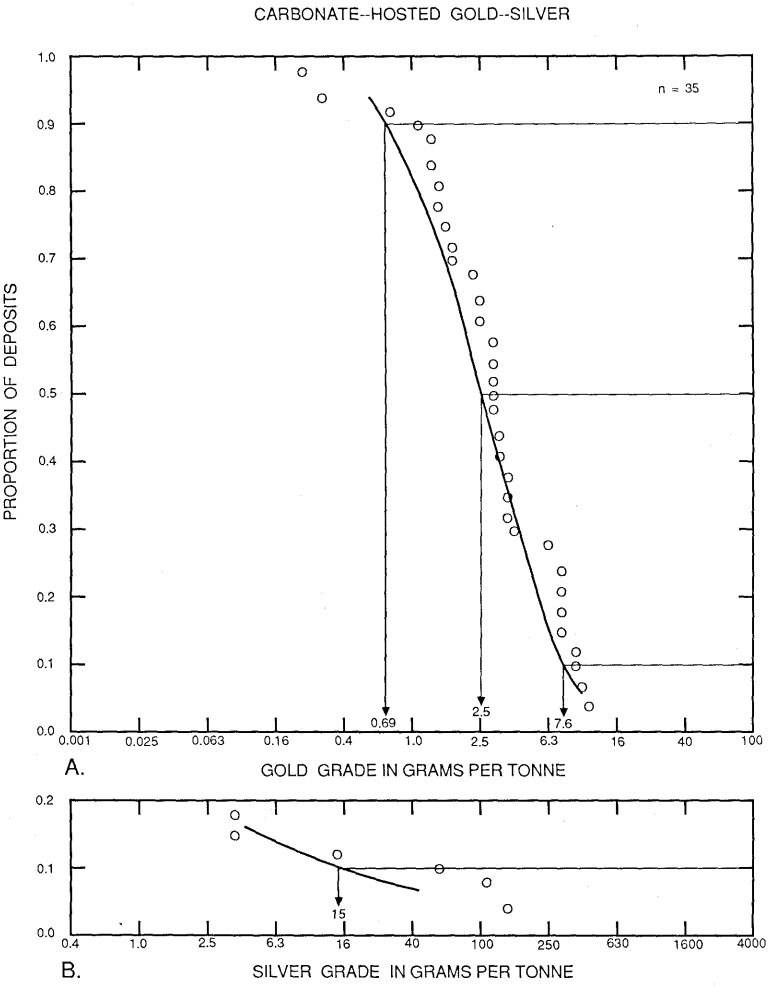

Figure 135. Precious-metal grades of carbonate-hosted Au-Ag deposits. A, Gold. B, Silver.