DESCRIPTIVE MODEL OF REPLACEMENT Sn

By Bruce L. Reed

APPROXIMATE SYNONYM Exhalative Sn (Plimer, 1980; Hutchinson, 1979).

DESCRIPTION Stratabound cassiterite-sulfide (chiefly pyrhotite) replacement of carbonate rocks and associated fissure lodes related to underlying granitoid complexes (see fig. 34).

GENERAL REFERENCE Patterson and others (1981).

GEOLOGICAL ENVIRONMENT

Rock Types Carbonate rocks (limestone or dolomite); granite, monzogranite, quartz porphyry dikes generally present; quartz-tourmaline rock; chert, pelitic and iron-rich sediments, and volcanic rocks may be present.

Textures Plutonic (equigranular, seriate, porphyritic).

Age Range Paleozoic and Mesozoic most common; other ages possible.

Depositional Environment Epizonal granitic complexes in terranes containing carbonate rocks. Note: the epigenetic replacement classification for these deposits has been questioned and an alternative exhalative synsedimentary origin followed by postdepositional metamorphic reworking hypothesis proposed (Hutchinson, 1979, 1982; Plimer, 1980; Lehmann and Schneider, 1981).

Tectonic Setting(s) Late erogenic to postorogenic passive emplacement of high-level granitoids in foldbelts containing carbonate rocks; alternatively, tin and associated metals were derived from submarine exhalative processes with subsequent reequilibration of sulfide and silicate minerals.

Associated Deposit Types Greisen-style mineralization, quartz-tourmaline-cassiterite veins, Sn-W-Mo stockworks, Sri-W skarn deposits close to intrusions.

DEPOSIT DESCRIPTION

Mineralogy Pyrhotite + arsenopyrite + cassiterite + chalcopyrite (may be major) + ilmenite + fluorite; minor: pyrite, sphalerite, galena, stannite, tetrahdedrite, magnetite; late veins: sphalerite + galena + chalcopyrite + pyrite + fluorite.

Texture/Structure Vein stockwork ores, and massive ores with laminations following bedding in host rock, locally cut by stockwork veins, pyrhotite may be recrystallized.

Alteration Greisenization (± cassiterite) near granite margins; sideritic alteration of dolomite near sulfide bodies; tourmalization of elastic sediments; proximity to intrusions may produce contact aureoles in host rocks.

Ore Controls Replacement of favorable carbonate units; fault-controlled fissure lodes common. Isolated replacement orebodies may lie above granitoid cupolas; faults provide channels for mineralizing fluids.

Geochemical Signature Sn, As, Cu, B, W, F, Li, Pb, Zn, Rb.

EXAMPLES

Renison Bell, AUTS	(Patterson and others, 1981)
Cleveland, AUTS	(Collins, 1981)
Mt. Bischoff, AUTS	(Groves and others, 1972)
Changpo-Tongkeng, CINA	(Liang and others, 1984)

GRADE AND TONNAGE MODEL OF REPLACEMENT Sn

By W. David Menzie and Bruce L. Reed

COMMENTS This model is built with deposits from Tasmania. Deposits of this type also occur in the Dachang and Geijui ore fields of the Peoples Republic of China. Potential by-products from this type of deposit include zinc, lead, and copper. See figs. 37, 38.

DEPOSITS

Name	Country
Cleveland	AUTS
Mount Bischoff	AUTS
Queen Hill	AUTS
Razorback	AUTS
Renison Bell	AUTS
St. Dizier	AUTS

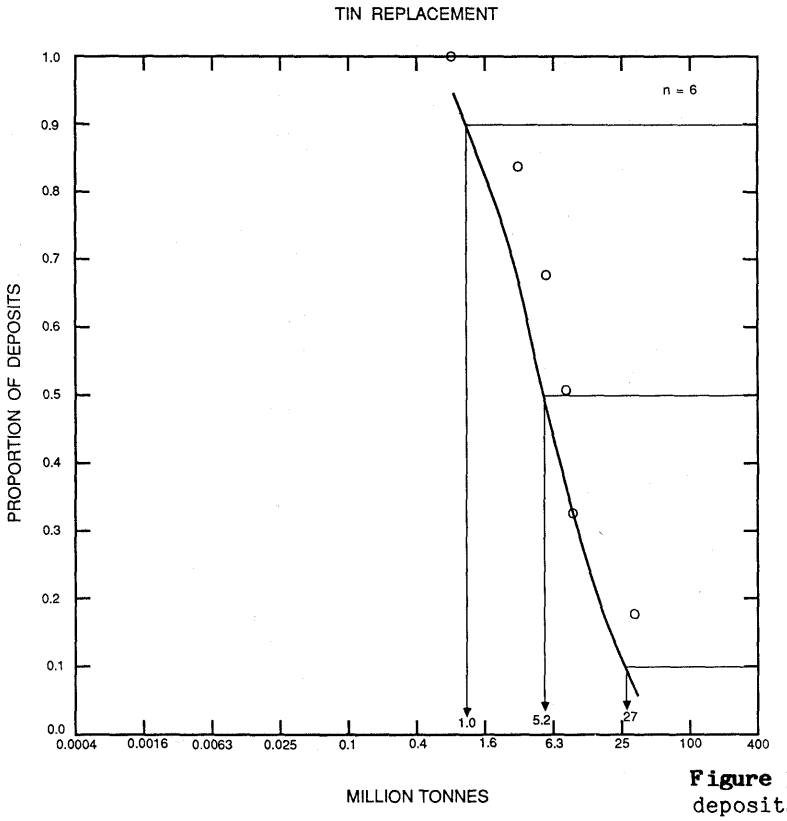

Figure 37. Tonnages of Sn replacement deposits.

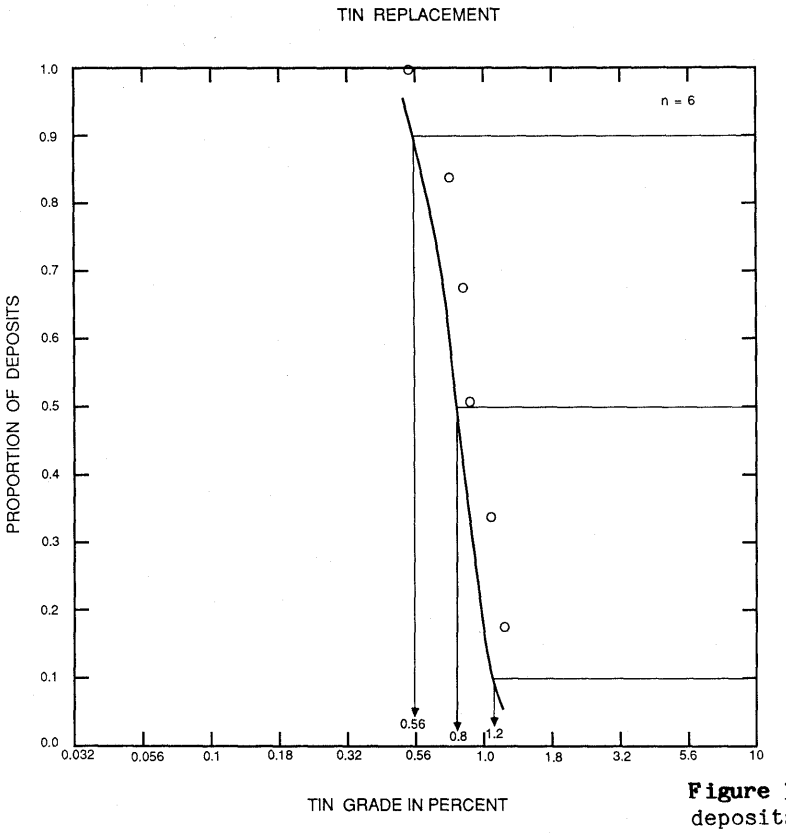

Figure 38. Tin grades of Sn replacement deposits.