DESCRIPTIVE MODEL OF SEDIMENTARY Mn

By William F. Cannon and Eric R. Force

APPROXIMATE SYNONYM Bathtub-ring Mn.

DESCRIPTION Shallow marine (non-volcanogenic) sedimentary Mn deposits formed around rims of anoxic basins during transgression (see fig. 175).

GENERAL REFERENCE Cannon and Force (1983).

GEOLOGICAL ENVIRONMENT

Rock Types Shallow marine sediments, most commonly carbonates, clay, and glauconitic sand, commonly with shellbeds, in transgressive sequences associated with anoxic basins.

Age Range Mostly in "anoxic events," narrow time periods within the early Paleozoic) Jurassic, and mid-Cretaceous, but may be in rocks of any age associated with anoxic basins.

Depositional Environment Shallow (50-300 m) marine, commonly in sheltered sites around paleo-islands. Most deposits overlie oxidized substrates, but basinward, carbonate deposits may be in chemically reduced settings.

Tectonic Setting(s) Stable cratonic interior basin or margin.

Associated Deposit Types Locally, sedimentary phosporites, sediment-hosted Cu.

DEPOSIT DESCRIPTION

Mineralogy A variety of Mn carbonates (mostly basinward) and oxides (mostly landward).

Texture/Structure Commonly as oolites, pisolites, laminae, and shell replacements.

Alteration Supergene alteration to high-grade ore is common.

Ore Controls Oxidation-reduction interface (involves age, paleobasin reconstruction, paleodepth of site) and lack of elastic dilution.

Weathering Mn carbonates may weather to brown, nondescript rock. Black secondary oxides are common.

Geochemical Sigature None known.

EXAMPLES

Molango (Jurassic), MXCO	(Tavera and Alexandri, 1972)
Nikopol (Oligocene), USSR	(Sapozhnikov, 1970)
Groote Eyland (Cretaceus), AUTN	(Frakes and Bolton, 1984)

GRADE AND TONNAGE MODEL OF SEDIMENTARY Mn

By Dan L. Mosier

DATA REFERENCES Most data from DeYoung and others (1984).

COMMENTS Because available grade and tonnage estimates represent mines from, in some cases, very extensive deposits and because the numbers are calculated at differing cutoff grades, the endowment of these deposits is undoubtedly much larger than indicated in these figures. See figs. 176-177.

Model 34b--Con.

DEPOSITS

Name	Country	Name	Country
Akviran	TRKY	Matese-Ciociaria	ITLY
Andhra Pradesh	INDA	Molango	MXCO
Ansongo	MALI	Morro da Mina	BRZL
Azul-Carajas	BRZL	Naniango	UVOL
Bolske-Tokmak	URRS	Nikolaevskoe	URRS
Chiatura	URRS	Nikopol	URRS
Chiwefwe	ZIMB	Nizne-Udinskaja	URRS
Groote Eylandt	AUNT	Otjosondu	SAFR
Gujarat	INDA	Ravensthorpe	AUWA
Horseshoe	AUWA	Seiba	URRS
Hsiangtan	CINA	Shimoga (Karnatoka)	INDA
Imini	MRCO	Timna	ISRL
Istranca	TRKY	Uracum	BRZL
Kalahari	SAFR	Urkut	HUNG
Kamenskoe	URRS	Usinsk	URRS
Kaochiao	CINA	Varna	BULG
Madhya Pradesh	INDA	Wafangtzu	CINA
Manuel Killigrews	CNNF		

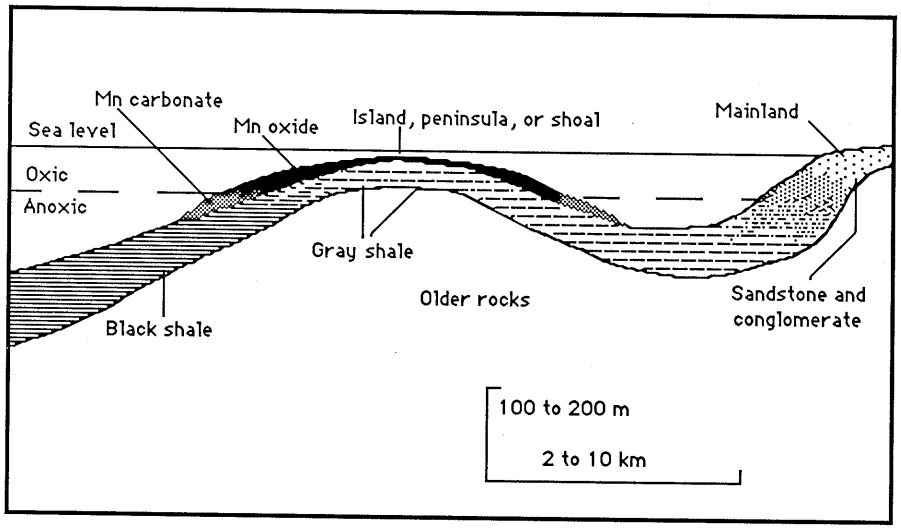

Figure 175. Cartoon cross section showing relation of sedimentary facies to sedimentary Mn deposits.

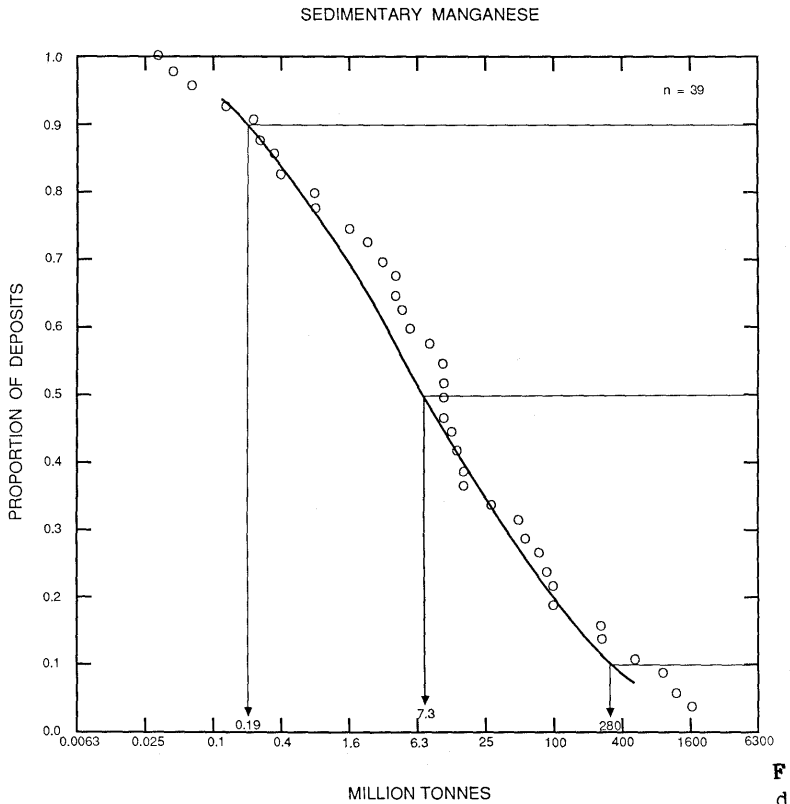

Figure 176. Tonnages of sedimentary Mn deposits.

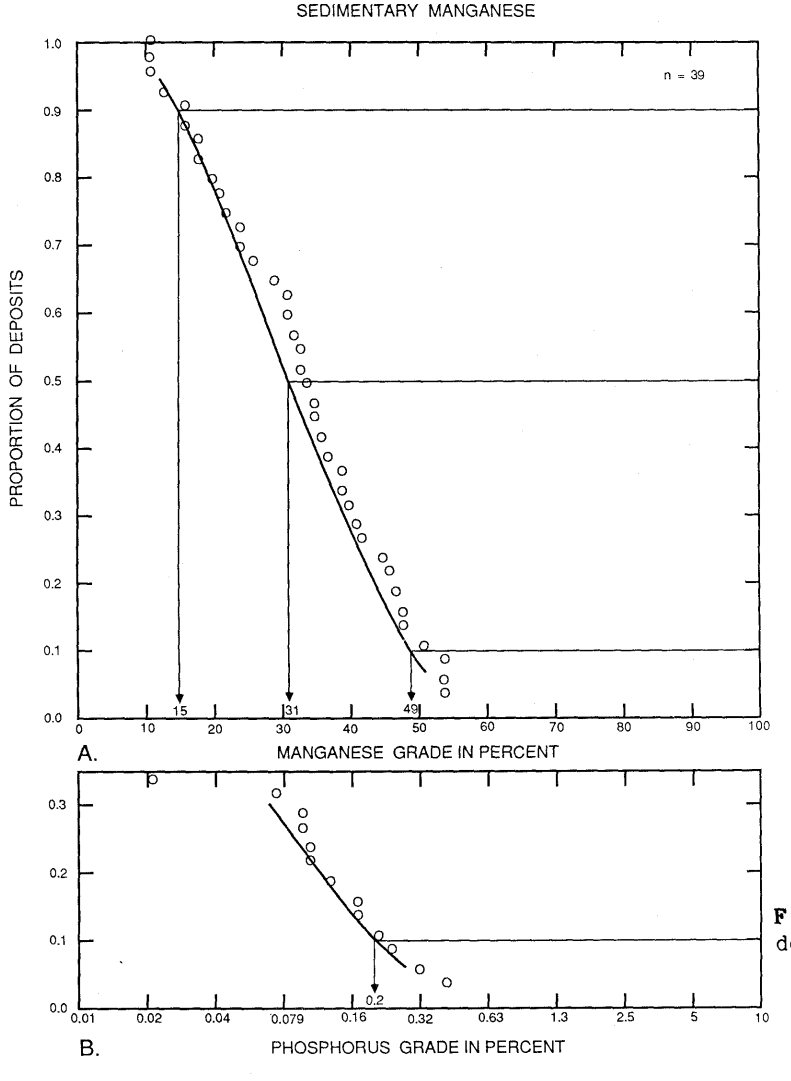

Figure 177. Metal grades of sedimentary Mn deposits. A, Manganese. B, Phosphorus.