

Manto

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Manto of galena, sphalerite, and pyrrhotite (with calcite "nose") replacing Lagrima Formation; J-North Trend, 18 level, Mina Buena Tierra, West Camp, Santa Eulalia, Chihuahua, Mexico. Dr. Peter Megaw photo.

The lexicon of terms used to describe mineral deposits is grounded in simple morphology as well as genetic mechanisms of deposits. A common emplacement style for ore deposits is known as a *manto*. The origin of the term *manto* is the Spanish word for blanket or mantle, and so *manto* and *manto-type deposits* are terms used to describe flat-lying, pancake-shaped to elongate concentrations of minerals of hydrothermal origin (see fig.). They are grossly parallel to bedding in sedimentary host rocks but are not necessarily strata bound. Classically, *manto* has been used to describe carbonate-hosted, intrusion-related hydrothermal mineral deposits that typically form as semiconformable replacements of sedimentary strata. Thus, the ore minerals form after the host rock and are called *epigenetic*. The mineral species that are found in mantos are dependent on the nature and type of hydrothermal system involved in their emplacement.

Chimney-style orebodies are often associated with manto-style emplacement of ore minerals. *Chimneys*, also referred to as *pipes*, are usually vertically oriented, roughly cylindrical or tabular bodies of replacement mineralization that cut steeply across bedding. In some cases pipes may lie at relatively low angles and/or be confined to a single stratum. Unfortunately, the common, close proximity of these two emplacement geometries—and the ambiguity of where to draw the line between them—has led to confusion between the two.

To make matters worse, both genetic and compositional aspects have crept into the usage. In Central and North America the use of *manto* is typically restricted to epigenetic deposits; however, in South America it is commonly used to describe mineral deposits that are both epigenetic and *syngenetic* (formed at the same time as host-rock formation). In other places *manto* has been used to describe skarn mineralization, whereas the term *chimney* has been applied to massive-

sulfide replacements. This has led to many inconsistencies in the literature regarding the proper use of the term *manto*. Thus, Dr. Peter Megaw (an expert on carbonate-hosted replacement deposits and mantos) argues that the term should be descriptive of the physical shape of the deposit only and not carry any genetic or compositional connotations.

Some classic examples of manto-type deposits are the Santa Eulalia district, Chihuahua, Mexico, famous for numerous minerals, including rhodochrosite, mimetite, creedite, and calcite (Megaw 1997); the manto fluorite deposits of the Buenavista-Encantada and El Tule mining districts, northern Coahuila, Mexico (Temple and Grogan 1963); and the Gilman district and Eagle mine, Eagle County, Colorado, which is discussed in the article by William Warren Jr. and Ed Pedersen in this issue.

A GeoRef[®] search on *manto* yielded scores of citations. Among the good references that cover the structure and shape of manto-type deposits are Prescott (1926) and Megaw (1998).

REFERENCES

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