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Ore Deposits of South America: Preface

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Although South America's chalcophile terranes largely dominate global copper inventories, the continent is also rich in a variety of mineral systems and is host to some of the world´s largest gold, tin, silver, zinc, and iron ore deposits. Porphyry copper (molybdenum, gold) deposits, including their supergene enriched blankets, predominate in the Central Andes of Chile and Peru, but copper resources hosted by iron oxide copper-gold (IOCG) deposits in both the Andes and the Amazon region (Carajás) are also important, and manto-type copper deposits of northern and central Chile constitute an interesting productive clan.

Mineral deposits are widely distributed throughout the continent, although clustering of large, world-class deposits in certain fertile regions is apparent. As in the case of copper, gold is also primarily concentrated in several segments of the Andes and parts of the Guiana and Brazilian Shields. Gold occurs in high-, intermediate-, and low-sulfidation epithermal deposits, typical of the Andes, with the last two also important in the extra-Andean Patagonian region of southernmost South America. Intrusion-related and orogenic deposits are common in shield terranes, and paleoplacer deposits constitute a local, albeit interesting curiosity. Although from a gold resource perspective South America ranks behind other continental regions (Africa, North America, Central Asia), the continent's gold output is significant in a world context, particularly when by-product gold from porphyry, IOCG, and VMS deposits is considered.

Polymetallic (Pb-Zn-Ag-Sn) mineralization is a key ingredient of the metallogenic signature of the Peruvian Andes, more so than any other Andean or Shield regions of South America. Polymetallic mineralization in the porphyry environment includes a variety of skarn, carbonate-replacement, and Cordilleran vein deposits. VMS mineralization is probably less abundant in South America than in other continents, but is present in cordilleran (Peru, Ecuador, Colombia, Venezuela) and cratonic (Brazil) environments. The Andean tin belt extends from southern Peru through Bolivia to northernmost Argentina and includes tin-only, tin-tungsten, and tin-polymetallic associations in tin-rich porphyries, veins, and epithermal deposits. MVT deposits occur in sub-Andean regions of Peru, the supergene oxidation of some leading to the formation of nonsulfide zinc deposits. Older metallogenic events in the continent have produced sedimentary-exhalative mineralization in Argentina and Brazil as well as VMS deposits in the Amazon craton, whereas world-class hypogene zinc silicate mineralization was formed by metal-rich basinal brines in Proterozoic carbonate and siliciclastic rocks in southern Brazil.

This Society of Economic Geologists compilation contains 483 papers on mineral deposits of South America published over 112 years—from 1906 to 2018—in *Economic Geology,* Special Publications (SP), Reviews volumes, Economic Geology Monographs, the *SEG Newsletter*, field trip guidebooks, and the Economic Geology Anniversary Volumes. It effectively replaces and expands a previous compilation on Andean deposits (*Ore Deposits of the Andes*, 2012) and follows a similar structure, reflecting principal ore deposit types and regional metallogenic studies. Two new sections (Orogenic Gold and Magmatic Deposits) are added to the original nine sections of the 2012 compilation (Volcanogenic Massive Sulfide, Epithermal, Polymetallic Ag-Sn-W, Porphyry-Breccia Pipe-Manto, Skarn, Sedimentary Base Metal, Iron Oxide Copper-Gold, Regional Metallogeny, and Miscellaneous Deposits), reflecting new entries of deposits from the cratonic regions of Brazil and the Guianas.

Not surprisingly, the majority of the papers (137) fall into the porphyry Cu (Mo-Au)-breccia-manto category, followed by 73 papers of polymetallic affiliation, and 42 epithermal of various sulfidation states, all reflecting the Andean input to the continent's metallogeny. Additionally, 31 papers on IOCG deposits reflect the contribution from Chilean, Peruvian, and Brazilian (Carajás) deposits. This section has also been expanded to include a combination of IOCG and iron oxide-apatite (IOA) deposits, given the genetic links between the two styles and the recent research on Chilean IOA systems. As a result, descriptions of most key, world-class producers and past producers of the continent are included in this compilation, which also incorporates two important sections, one on regional metallogenic studies (42 papers of the regional metallogeny section) and another on miscellaneous deposits, with 86 papers dealing with a variety of mineral deposits (diamonds, placer gold, fluorite, iron ore, nitrates, emeralds, platinum group elements, manganese, beryllium, topaz, kaolin, and bauxite) as well as deposits of controversial origin. Many of the miscellaneous papers deal with iron ore mineralization in banded iron formation-type deposits in Brazil, from the early literature on itabirites to the more recent research on the world-class Carajás deposits. The section on orogenic gold contains 23 papers largely describing aspects of Shield gold deposits, chiefly from greenstone belts in Brazil, but also from emerging districts in Guyana, whereas the section on magmatic deposits incorporates 14 descriptions from 11 different Brazilian deposits containing one or more of copper, nickel, PGE, chromite, and cobalt as principal commodities.

Smaller sections on VMS, skarn, and sedimentary base metal deposits are also a reflection of the continent´s metallogenic styles, although the rather small number of entries in the skarn category is surprising given the abundance of the deposit type in the Peruvian Andes. Nevertheless, the geologic descriptions of the principal skarns of the region neatly complement this compilation.

A profound understanding of the key controls on regional fertilization for specific types of deposits in the continent is important for exploration success. Future replenishment of mineral resources is likely to come from discoveries in proven regions of the continent, although new districts will certainly emerge as a natural consequence of isolated discoveries made since the start of the century, once the potential for new deposits is realized.