

**Metallogenic Evolution and Migration of the Magmatic Front
in the Chilean Andes Between 21° and 26° South***

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The segment of the Andes between 21° and 26° South is one of the richest in this copper-specialized metallogenic province and probably characterizes the most intense mineralizing processes related to subduction of oceanic lithosphere beneath continental South America.

The pre-Mesozoic basement is sparsely mineralized despite magmatic events in Ordovician-Silurian, and Late Carboniferous-Triassic times, the latter being associated with subordinate Cu, Mn, Ag and Pb hydrothermal deposits.

From Jurassic to Early Cretaceous times, plutonism and volcanism were apparently almost continuous, with pulses at 170-165 Ma, 145-140 Ma and 130-115 Ma, and the magmatic front was located near the present coast. Related to this metallogenic epoch are extensive volcanic-hosted stratabound Cu deposits and Cu veins hosted in Jurassic plutons. Minor veins with Au, Ag, Fe, Ni-Co and Mn were also formed. From Late Cretaceous to Paleocene times (78-24 Ma) the magmatic front had migrated about 80 km towards the conti-

ment, and although magmatic activity was almost continuous, radiometric dates show clusters at 70-60 Ma and 45-35 Ma. The major ore deposits of the region are related to the Oligocene pulse, which contains, among others, the super giant porphyry Cu deposit of Chuquibambilla, and a number of epithermal Ag, Au, and Cu veins, polymetallic Cu-Au-Ag, Sb, and Co veins, as well as minor Cu, Mn and Fe stratabound deposits.

The youngest magmatic-metallogenic epoch is the Miocene to Quaternary event, during which the magmatic front migrated eastward up to 200 km, to form the present Andean high Cordillera and Altiplano of Chile-Bolivia-Argentina. The most significant mineralization associated with this phase consists of the large irregular magnetite flows (?) of EL Laco volcanic complex, minor Ag, Sb and Sn veins in the Nevados de Poquis area and numerous S deposits associated with volcanic vents.

The landward migration of the magmatic front appears to have taken place in discrete "jumps", preceded by deformational phases, and both seem to

coincide with major reorganization of lithospheric plates, in Late Cretaceous and Miocene times.

The distribution and variable characteristics of metallic ore deposits in this region can be related to

particular petrologic association, basement tectonics and the local level of erosion.

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