

Unknowns and Missing Links in the Metallogenic Framework of the Peruvian Andes

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Recent metallogenic synthesis for the Central Andes stress longitudinal belts specialized in age and style of mineral deposits. Transverse orogenic segmentation and paired magmatic arcs operated as a consequence of predominantly frontal but undulating plate subduction.

Successful testing of prognostic models, in carefully selected prospects, has led to the discovery of new polymetallic ore bodies in historical mining districts and in entirely new mineral belts. Main examples of economically significant new discoveries in Peru are the Yanacocha enargite-related oxide-Au ores, the Antamina Cu-Zn skarns and Cu-Mo porphyries, the Uchucchacua Ag skarns, the low sulfidation epithermal Au-Ag veins at Orcopampa and the Sn-rich vein lodes at San Rafael.

Metallogenic questions that remain to be addressed in Peru are: 1) structural control of location, size and grade of Paleozoic "mesothermal" Au-veins; 2) basin analysis for the Mesozoic volcanogenic massive sulfide deposits and their submarine volcanic arcs; 3) volcanology of the Cenozoic metallogenic pulses and their porphyry and epithermal deposits.

Undocumented geological facts of potential economic relevance to be tested at regional scales are: a) several missing-links of Neogene arcs in central and southern Peru; b) source areas and Au-bearing vein structures for the Marañón, Inambari and Madre de Dios fluvial and alluvial Au deposits; c) association of porphyry Cu deposits with enargite Au lodes to Pb-Zn-Ag replacement deposits as the result of superimposed metallogenic stages.