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# Metallogenesis and Tectonic Processes Along the Tethyan Mountain Ranges of the Middle East and South Asia (Oman, Himalaya, Karakoram, Tibet, Burma, Thailand, Malaya)

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The genesis of mineral deposits has been linked to specific tectonic settings in the past, but also, less frequently, to tectonic processes. Understanding processes of oceanic and continental collision tectonics is crucial to understanding key source, transport, and emplacement factors leading to magmatic, metamorphic, and hydrothermal mineral deposits. Geological studies of most ore deposits typically focus on the final stages of concentration and emplacement. The ultimate source (mantle, lower crust, upper crust) of many mineral deposits remains highly speculative. Along the Tethyan collision zones of Asia, every stage of the collision process can be studied, from the initial oceanic settings where ophiolite complexes were formed to subduction zone and island arc settings with UHP-HP metamorphism to the continental collision settings of the Himalaya and advanced, long-lived collisional settings such as the Karakoram ranges and Tibetan Plateau. The India-Asia collision closed the intervening NeoTethys ocean at ~50 Ma and resulted in the formation of the Himalayan mountain ranges, and increased crustal thickening, metamorphism, deformation, and uplift of the Karakoram ranges, Tibetan Plateau, and older collision zones across central Asia. Metallogenesis in oceanic crust (hydrothermal Cu-Au; Fe, Mn nodules) and mantle (Cr, Ni, Pt) can be deduced from ophiolite complexes preserved around the Arabia/India-Asia collision (Oman, Ladakh, South Tibet, Burma, Andaman Islands). Tectonic-metallogenic processes in island arcs and ancient subduction complexes (VMS, Cu-Zn-Pb) can be deduced from studies in the Dras-Kohistan arc (Pakistan) and the various arc complexes along the Burma-Andaman segment of the collision zone. Metallogenesis of Andean-type margins (Cu-Au porphyry; Au-Ag) can be seen along the Transhimalayan ranges of Pakistan, Ladakh, South Tibet, and Burma. Metallogenesis of continent-continent collision zones is prominent along the Malay-Thailand-Burma Sn-W granite belt but less common along the Himalaya. The Mogok metamorphic belt of Burma is known for its gemstones associated with regional high-temperature metamorphism (ruby, spinel, sapphire, etc). In Burma it is likely that extensive alkaline magmatism has contributed extra heat during the formation of high-temperature metamorphism. This paper attempts to link metallogeny of the Himalaya-Karakoram-Tibet and Burma collision zone to tectonic processes derived from multidisciplinary geological studies.