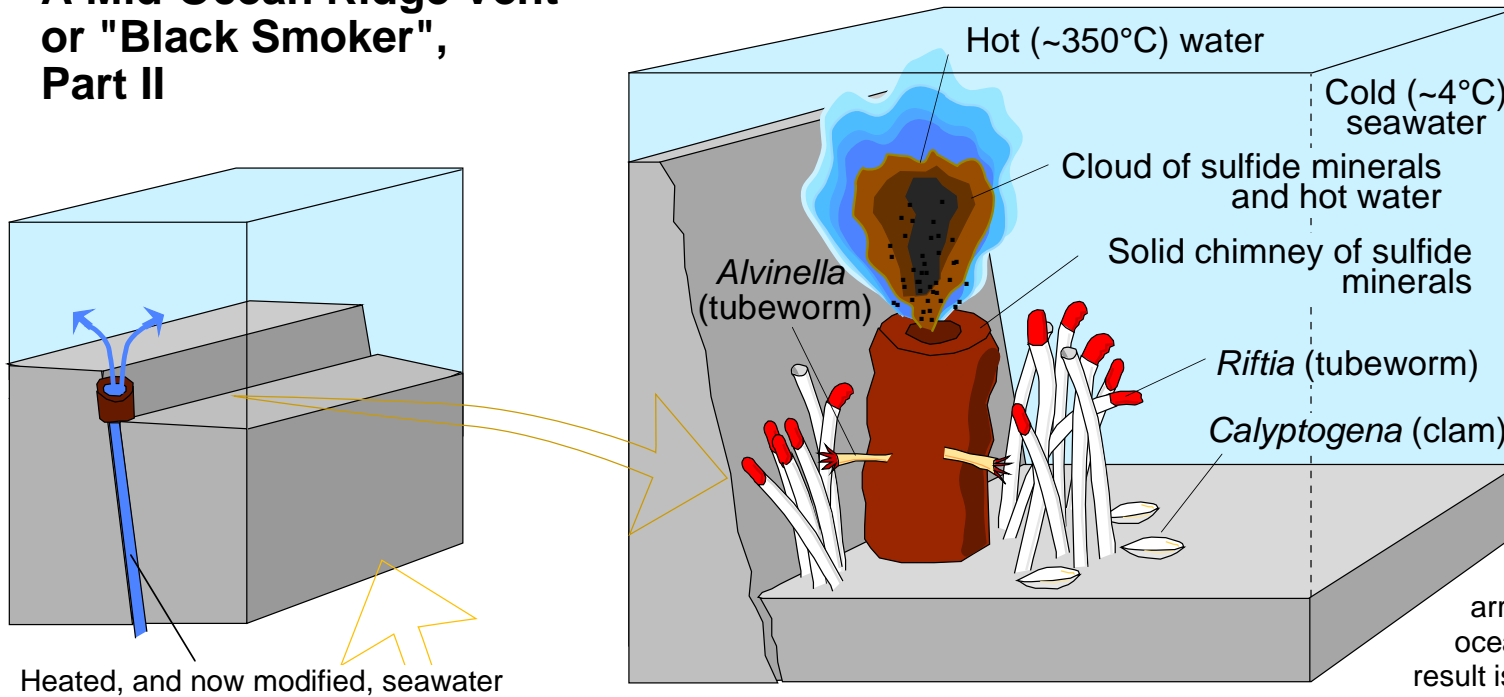


A Mid-Ocean Ridge Vent or "Black Smoker", Part II



At the mid-ocean ridges, hot magma rises from Earth's interior as the two tectonic plates on each side of the ridge move apart. Heat from the magma chamber warms water in fractures in the center of the mid-ocean ridge, and that water therefore rises. Water from the flanks of the ridges moves inward to replace the rising water, and seawater (the wavy blue arrows at left) moves from the ocean into the seafloor. The result is circulation of water from

the ocean into the ridge, heating, and ejection of that water at vents along the crest of the ridge. Sulfate (SO_4^{2-}) in the seawater is chemically reduced to sulfide during this journey, with two results. First, iron, copper, and other sulfur-friendly elements are precipitated as sulfides where the water emerges, giving a chimney-like ring of sulfide minerals and a smoke-like cloud of mineral-laden water. Secondly, the emerging water is rich in hydrogen sulfide (H_2S) that bacteria use in chemosynthesis. The flourishing bacteria are consumed by a variety of filter-feeding organisms, supporting intense, if geographically small, ecosystems near the vents.

