

Megashear tectonics and Appalachian magmatism

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Megashear tectonics may be described as the variety of deformational processes resulting from oblique plate interaction, dominated by ductile shear zones but including zones of extension and compression, eg. as characterized by the interaction of the Pacific and American plate along the San Andreas fault zone. A megashear environment has been postulated by a number of workers for late Paleozoic orogenesis of the north Atlantic regions, and the author has applied the concept to interpretation of the origin of granitoid rocks in the Northern Appalachians. These rocks range from peralkaline through metaluminous to peraluminous with mainly crustal isotopic ratios, reflecting the differing tectonic environments described above.

Granitoid rocks of the southern Appalachians are more typically calc-alkaline with mantle isotopic ratios, suggesting more "normal" subduction-controlled petrogenetic processes. However, these too can be related to the

megashear environment, occurring at the termination of the Hercynian megashear where the collisional regime would best be accommodated by subduction. Local zones of such compression might also be reflected in calc-alkaline volcanism such as that around St. John, New Brunswick.