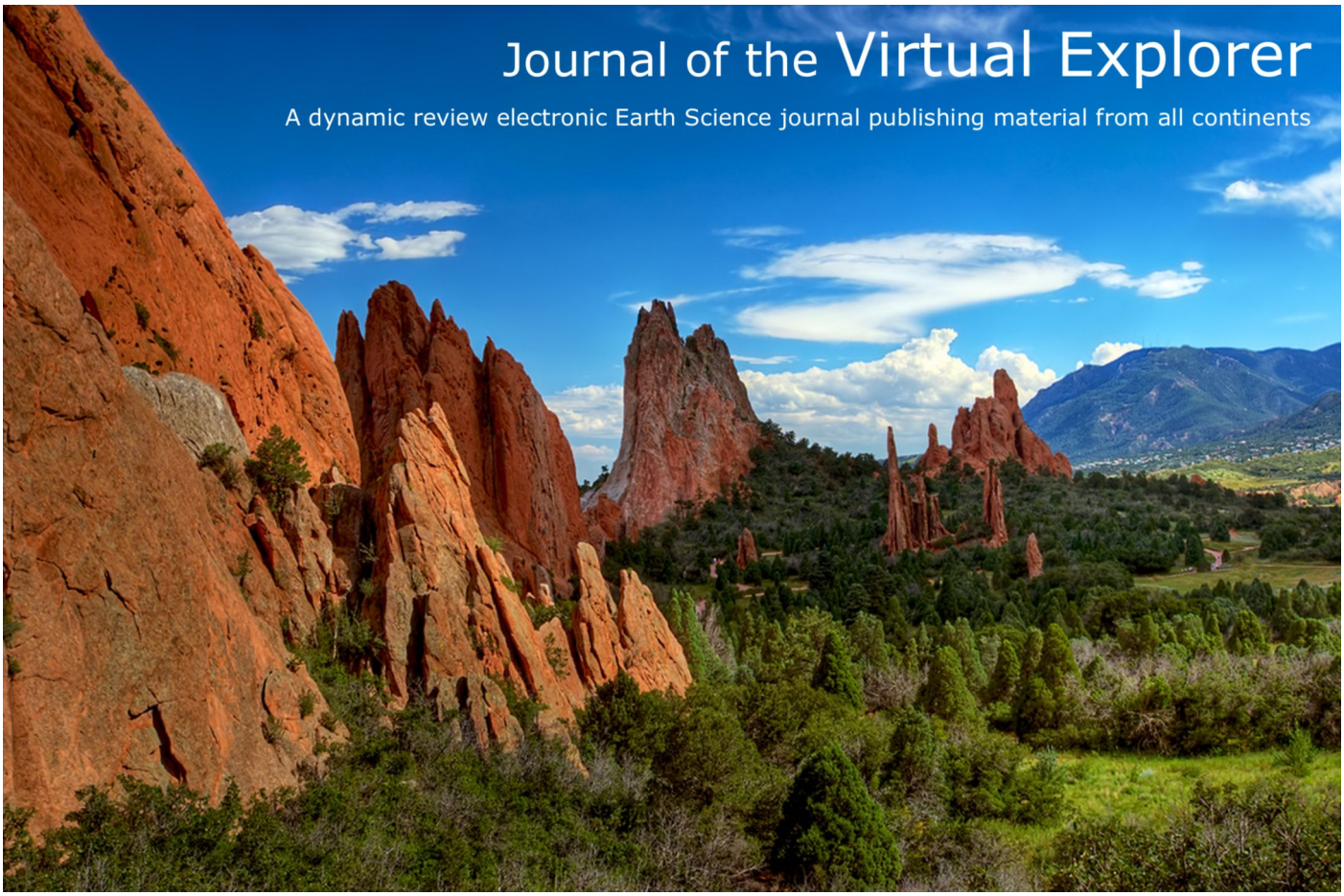

Three Examples of Metamorphic Differentiation

Raymond C. Fletcher

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Three Examples of Metamorphic Differentiation

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Abstract: Metamorphic differentiation or segregation of dissolved and reprecipitated minerals in the filling of a boudin gap, in the growth of new grains in a pressure shadow around a cylindrical inclusion, and in limb-to-hinge differentiation in folding may all be expressed in similar terms. A ratio of a rate of deformation arising from dissolution, transport, and precipitation to that due to viscous creep is expressible as the product of two dimensionless quantities. One, the Bayly Number, B, incorporates the viscosity, quantities describing the kinetics of dissolution and precipitation and diffusional transport, and a characteristic length scale. Large B implies significant differentiation during some phase of the structural evolution. A second quantity incorporates dimensions of the current structure, and may change markedly with its evolution.

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