

## **Two scientific revolutions in the earth sciences**

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T.S. Kuhn has shown that science advances by stages or paradigms of normal science occasionally altering with greater, nonrational scientific revolution. This century examples of revolutions have been associated with distant galaxies, quantum mechanics and DNA molecules. Each was found by recognizing a long-standing error or deficiency. In geology

Kuhn mentions only that Hutton and Lyell founded a paradigm. Many since have sought a revolution.

This paper suggests that geology and geophysics are separate paradigms, each ripe for revolutions. The error in geology has been neglect of mantle plumes which rework the surface. J.D. Dana first noted and then repudiated them. In

geophysics the error has been neglect of the control of faulting in the lithosphere by the Coulomb/Navier/Stokes law of brittle failure which E.M. Anderson indicated, and which also applies to mountain building.

Two separate revolutions to correct these errors seem likely to lead to a common fresh paradigm uniting structural geology, geophysics and classical physics.