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**COVER** Contours of constant entropy in a cross section of a spherical shell in which thermal convection in the mantle is numerically simulated. The shell is uniformly heated along its inner boundary. Red and yellow contours show hot upwelling currents; light and dark blue contours show regions of relatively cold downwelling currents. Upwelling occurs in columnar plumes and downwelling occurs primarily in planar sheets, similar to upwelling and downwelling in the earth's mantle. See page 950. [Image was made on a DICOMED D48CR film recorder from numerical data generated on a CRAY XMP-48 at the San Diego Supercomputer Center by D. Bercovici, G. Schubert, and G. A. Glatzmaier]

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