

# **Evolution of Porosity Along a Migrating Dolomite Front, Devonian Swan Hills Formation, West-central Alberta**

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Reimer and Teare (1992) interpreted the leaching of limestones along the periphery of dolostone bodies to be by acids derived from thermal cracking and oxidation of hydrocarbon during hydrothermal dolomite formation.

I present an alternative model for the leaching of comparable limestones, based on the investigation of the zone of transition from hydrothermal dolostone to limestone in the Swan Hills Formation of west-central Alberta. In this zone micropores in the undolomitized walls of stromatoporoids become more abundant toward the dolostone. At the last vestige of calcite the walls of the centre of stromatoporoids and chamber-filling calcite cements are almost completely dissolved, due to a coalescing of micropores. In the dolostone, the central portions of stromatoporoids are completely dissolved, producing molds that are ubiquitous in many dolostones.

The model of porosity evolution relates the leached microporosity in the partially dolomitized halo and the molds in the dolostone to a migrating dolomite front. The principal tenets of this model are that the leaching of calcite is part and parcel of the dolomitization process and that pores in dolostones formed mainly by dissolution of calcite in the peripheral partially dolomitized halo. In this evolutionary model, micropores form by dissolution of the undolomitized portion of stromatoporoids, increasing in abundance toward the dolostone and coalescing at the dolostone-partially dolomitized limestone contact. As the dolomite front moves outward, the extensively leached interior of stromatoporoids continue to undergo dissolution to produce the classical dolostone molds and the peripheral zone of limestone leaching advances.