

**A New Fission Track Dating Facility at Dalhousie University: Results from the
Alberta Basin and Nova Scotian Margin**

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Fission track dating is a relatively new geochronological method, the theoretical ground work for which was established in the 1960's. Recent advances including the use of known age standards, have established the technique on equal footing with other geochronological methods. Fission tracks are damage zones in crystals caused by the spontaneous fission of uranium-238, and are retained in minerals below a closure or annealing temperature range (70-120°C for apatite; 170-220°C for zircon). Apatite and zircon recovered from sedimentary and crystalline basement rocks have been found to be particularly useful in determining the amount and timing of unroofing.

The FTD facility was set up as part of a thesis project and is now funded by a 3-year NSERC grant. A workshop by Randy Parrish (GSC) in 1984 established our laboratory techniques, and

we are now regularly producing apatite and zircon fission track dates.

In the Alberta Basin, samples were collected from Cretaceous Mannville, Viking and Belly River strata in wells along a transect from Edmonton to the foothills. Apatite fission track ages of 26 to 68 Ma are the result of the overprinting effects of differing depths of burial, hot migrating fluids and the timing of uplift throughout the 100°C geotherm.

Apatite fission track dates from onshore Nova Scotia all indicate a major thermal event during the Triassic, with subsequent uplift and erosion. Results from the offshore Scotia Margin indicate good agreement with existing data on the thermal history from vitrinite reflectance, aromatization-isomerization, and bottom hole temperatures.