

## Origin of the Stellarton Subbasin

*G. Yeo, Geological Survey of Canada  
601 Booth St., Ottawa, Ont. K1A 0E8*

*K. Gillis, Nova Scotia Department of Mines and Energy  
P.O. Box 999, Stellarton, N.S. B0K 1S0*

The Stellarton Sub-basin is a small (6x21 km), elongate, easterly-trending, fault-bounded basin connecting the two principal fault systems north of the "Minas Geofracture", the Cobequid and Hollow Faults. Late Carboniferous (Westphalian B to D) grey shales, hosting numerous coal and oil-shale seams, with minor grey-tan and red sandstones, red mudstones, and conglomerates, fill the basin. These sediments, interpreted to be of lacustrine or fluvio-lacustrine origin, were derived from source areas to the north and south. North of the Stellarton Sub-basin, in fault-contact with or separated from it by a narrow body of older strata, lie partly time-correlative, grey-tan sandstones and red mudstones of the Pictou Group. These fluvialite deposits were derived from source areas to the west and south.

There is little doubt that the Stellarton Sub-basin developed as a consequence of early Hercynian, strike-slip movement on the Cobequid-Hollow Fault system. The mechanism of basin development is less certain, however. One suggested interpretation is that the Stellarton Sub-basin is a pull-apart basin resulting from secondary faulting at the termination of the Hollow Fault. Alternative models are that subsidence resulted from strike-slip along braided, curved faults, or formation of a rhomb-graben due to side-stepping transfer of

strain from the Hollow to the Cobequid Fault. The model must account for the structural juxtaposition of contemporaneous, but quite different sedimentary sequences in the Stellarton and Eastern Cumberland Sub-basins. During the Middle and Late Carboniferous, these sub-basins must have been separated by a highland which acted as a clastic source for both.

If left-lateral displacement predominated on the Hollow-Cobequid Fault system, then the Antigonish-Cobequid Highlands may have formed a continuous high between the Stellarton Sub-basin and the Eastern Cumberland Basin. If, as seems likely from consideration of the available geological evidence, right-lateral slip predominated, then the Stellarton and Cumberland basins would have been separated by a relatively broad Lower Carboniferous high.

Investigations which would help resolve the problem of the origin of the Stellarton Sub-basin include study of regional fault systems, particularly to determine the timing, sense and extent of displacement on them; detailed study of facies and thickness variations within the basin; study of the provenance and dispersal patterns of the Stellarton and Pictou groups, and paleomagnetic studies of Lower Carboniferous redbed units to test for post-depositional displacement.