

**Deposition and deformation of the Stellarton Formation, Nova Scotia:
strike-slip motion at the southern margin of the Magdalen Basin**

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The Stellarton Formation is a thick succession of Wesphalian (B-D) coal-bearing sedimentary strata that fills a lozenge-shaped basin at the junction of the Cobequid and Hollow Fault systems. The basin fill displays major facies changes both laterally and vertically. The basin fill is asymmetric, with mainly coarser clastic facies concentrated along the southern edge. The northern margin is characterised by thicker, more

numerous coal seams. The lower density sediments and coal seams within the basin produce a pronounced, negative (-7 mGals) gravity anomaly. Comparison of laterally equivalent sections suggests that subsidence was greatest near the basin centre, but that the subsidence history of the basin is overprinted by the effects of differential compaction in the basin-fill.

Outcrop-scale structures involve closely spaced listric nor-

mal faults striking predominantly north-south. The earliest faults are associated with load structures, and were probably formed while the sediment was still wet. Larger-scale normal faults are associated with 'roll-over' fault bend folds. These extensional structures are overprinted by a suite of structures indicating shortening of bedding. Small thrusts, marked by calcite veins in sideritic concretionary siltstone beds, locally account for between 5 and 10% shortening in an east-west direction. These thrusts cannot be traced into adjacent shale beds; they probably formed at a time when the siderite beds were well lithified but intervening muds were still plastic. Later thrusts cut all lithologies, locally reactivating the earlier extensional structures.

Deformation is most intense along the northwest basin margin. Sedimentary strata of the Stellarton Formation are folded about axes trending southwest-northeast, and cut by ex-

tensional faults trending northwest-southeast, consistent with an environment of dextral strike-slip motion. Adjacent to the basin, older Westpalian rocks (New Glasgow and Middle River Formations) are uplifted and overturned, facing northwest. Fault slices of Mabou Group (Namurian) with cover of Middle River Formation in this zone are interpreted as forming a positive flower structure.

The structure of the Stellarton basin is consistent with an overall history of dextral strike slip motion. Deposition probably occurred in a transtensional environment associated with a releasing bend in the Cobequid-Hollow fault system; subsequent transpression along the northwest margin was probably associated with a change in movement direction or fault geometry.