Concretionary green beds between Halifax and Goldenville Formations: local depocentres on a Continental Margin?

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Throughout mainland Nova Scotia the Lower Paleozoic Meguma Group is everywhere separable into a lower Goldenville Formation and an upper Halifax Formation. These sedimentary rocks were deposited in a basin or trough now tectonically shortened, but once much wider and possibly longer than the present outcrop area of the two formations. Schenk (1971) postulated that this trough comprised part of the ancient continental margin of northwestern Africa. Poole (1970) suggested that deposition of the lower formation had been from turbidity currents flowing subparallel to the present NE-SW grain of the mountain belt.

The Tremadocian/pre-Ludlovian Halifax Formation is found in places throughout the entire outcrop of the Meguma Group but it is notably widespread in Lunenburg and Queens counties. This is not a function of topography or of local variation in structural style. The succession preserved in Lunenburg and Queens is apparently thicker than it is in counties farther NE or SW.

Concretionary green strata including Mn-rich beds have been reported to be locally and sporadically present at the base of the Halifax Formation or at the top of the Goldenville Formation throughout mainland Nova Scotia. They are, however, particularly well developed below the thick Halifax succession of carbonaceous black slates and pyritiferous sandstones in Lunenburg County. Here, mapping of regional anticlines has shown that these green beds thicken and thin dramatically in directions both parallel and perpendicular to the fold axes. Areas now in the hinge zones of some anticlines may have had relief during deposition of the concretionary rocks. In cross sections of regional fold trains the green beds are either locally absent in certain fold hinges or the lithofacies of the green beds change across the hinge to differ on opposing fold limbs. Stratigraphical successions of these rocks up to one km thick have also been mapped to thin and terminate along a single fold axial trace over a distance of 50 km. The wedge-shape of large sandstone bodies in the green strata has locally controlled the shape and possibly the siting of at least one major gold-producing anticline.

It appears that concretionary, manganiferous green beds accumulated in small protected basins within the much larger "Meguma Trough". In Lunenburg and Queens counties they may herald the development of a depo-centre containing a relatively thick Halifax succession. Allowing for strike-parallel extension and strike-normal flattening, it seems that the protected basins trended NW-SE across rather than along the ancient continental margin.