

Facies correlations within the Ordovician Pointe de la Martinière Formation, Orléans Group, Québec

Lindsay A. Dunn and Ron K. Pickerill

Department of Geology, University of New Brunswick, P.O. Box 4400, Fredericton, New Brunswick E3B 5A3, Canada

The Orléans Group outcrops for some 20 km to the west of Québec City, along the southern shores of l'Île d'Orléans and the St. Lawrence River. The group, part of the Taconian allochthonous sequence, forms the Bacchus Nappe. It is bounded to the northwest by Logan's Line and the Lévis Nappe, and to the southeast by the River Boyer Nappe. The Orléans Group succession comprises the largely conformable Anse Maranda, Lauzon and Pointe de la Martinière formations. The sequence records the transgression of the Cambro-Ordovician, Laurentian, "Atlantic-type" passive margin. This study focuses on the Pointe de la Martinière Formation, with particular emphasis on depositional controls and facies correlations.

The Lauzon and Pointe de la Martinière formations are composed primarily of interbedded turbidites and shales, with the latter characterized by the appearance of red shales. Additional facies developed within the Pointe de la Martinière Formation include black shale-limestone intervals, dolomitic siltstones and shales and limestone conglomerates. These facies are interpreted to reflect deposition within a base of

slope/rise setting, with the contemporaneous Lévis Formation within the Lévis Nappe representing a more proximal depositional environment.

Black shale-limestone intervals are well-documented within the Lévis Formation. These intervals have been attributed to the intensification of the oxygen minimum layer during periods of marine onlap and coastal upwelling. The high level of biostratigraphic control displayed by the Lévis Formation enables the correlation of the black shale-limestone intervals, with those developed in the Pointe de la Martinière Formation. Further to the east, the black shale limestone intervals are not developed. However, dolomitic shales do form and are assumed to be genetically related to the black shale-limestone intervals and therefore possibly correlative.

The approach adopted in this study suggests that the Lauzon, Pointe de la Martinière boundary, when taken as the first appearance of red shale, is diachronous. This conclusion is corroborated by field observations of lateral facies shifts.