

Determination of protoliths and pressure-temperature conditions of metamorphic rocks in the "Pocologan mylonite zone", southern New Brunswick

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Southwest of the city of Saint John in southern New Brunswick, a belt of metamorphic and deformed granitoid rocks occurs between rocks that are definitively part of the Kingston terrane to the north and those that are part of the Brookville terrane to the south. Previously, this belt of rocks, herein termed the Pocologan belt, was included mainly in the Pocologan Mylonite Zone, but most of the components of the belt are not mylonites. They include metatuff, metasilstone, schist, amphibolite, calc-silicate rocks, and minor marble, with sheets of granite and diorite. On their northern margin, these distinctive rocks are in sharp, faulted contact with equally distinctive Silurian felsic volcanic rocks, granitic plutons, and amphibolitic sheets of the Kingston terrane. On its southern margin, the belt is in sharp faulted contact with variably deformed composite dioritic to granitic plutons of the Red Head granitoid suite. The Red Head granitoid suite is likely to be part of the varied suite of ca. 555 to 530 Ma plutons that comprise much of the Brookville terrane. However, it is not yet clear whether or not the metamorphic rocks of the Pocologan belt are equivalent to or part of the

metasedimentary Green Head Group of the Brookville terrane.

The mineral assemblage in metasilstone and schist includes biotite, muscovite, plagioclase, garnet, and staurolite. Calc-silicate rocks contain abundant amphibole, epidote, and garnet, and host magnetite deposits in the New River - Lepreau area. Preliminary analysis based on mineral assemblages and compositions indicates that metamorphism occurred at temperatures of ca. 600°C, with pressures of 6-7 kPa. The determination of the pressure-temperature conditions of these rocks during metamorphism, and the determination of the protoliths of these rocks may provide insight into the relationship between the Kingston and Brookville terranes.

Deformation in the area is attributed to mid-Paleozoic strike-slip movement, associated with the accretion of terranes in southern New Brunswick. The deformation associated with the rocks of the Pocologan belt included development of mylonitic zones that do not occur in the adjacent Kingston terrane.