Significance of trace fossils from the Tancook Member of the Goldenville Formation; Meguma Group, Mahone Bay area, Nova Scotia

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The Meguma Group of southern mainland Nova Scotia consists of a thick unit of dominantly sandstone turbidites (Goldenville Formation). The Goldenville-Halifax transition is well exposed on Big and Little Tancook islands in Mahone Bay, where sandy and muddy facies alternate in the uppermost part of the Goldenville Formation, the Tancook Member. The Tancook Member is overlain in turn by laminated manganiferous argillites (Mosher's Island Member of the Halifax Formation), and by black, pyrite-rich slates and turbiditic siltstones (Cunard Member). This succession records the progressive development of anoxic conditions in the Meguma Basin, probably related to relative sea-level rise.

The Tancook Member contains a relatively diverse ichnofauna for a deep-water Cambrian sequence comprising the ichnogenera *Helminthoidichnites*, *Helminthopsis*, *Palaeophycus*, *Paleodictyon*, *Rhizocorallium*, *Rusophycus*, *Skolithos*, and abundant *Teichichnus*. Of these, *Rhizocorallium*, *Rusophycus*, *Skolithos*, and *Teichichnus* are elsewhere more typical of shallow-water neritic sequences. Their occurrence in the Tancook Member presumably reflects either colonization by opportunists in a relatively deep-water setting or, alternatively, doomed pioneers periodically introduced by sediment gravity flows. *Helminthoidichnites*, *Helminthopsis*, and *Palaeophycus* are simple horizontal burrowing ichnotoxa that elsewhere are facies-crossing forms. To our knowledge the presence of *Paleodictyon* represents its only occurrence within a deep-sea Cambrian setting, other examples having all previously been made from neritic sequences.