A previously unrecognized Lower Ordovician sequence in southern New Brunswick: evidence for multistage development of Iapetus?

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Geological mapping and radiometric studies established the presence of a previously unrecognized, Lower Ordovician bimodal volcanic-sedimentary belt in the Annidale area of south-central New Brunswick. The belt constitutes the northeastern extension of the St. Croix Terrane and occurs immediately northwest of the Precambrian-Cambrian Avalon Terrane. The stratigraphy of the belt is characterized by a sequence of intensely deformed pillow basalts, mafic and felsic tuffaceous rocks, felsic domes and flows, and thinly bedded, locally carbonaceous, siltstones and slates. Two precise U-Pb dates on zircon from massive and deformed felsic volcanic rocks yielded ages of 493 ± 2 Ma and 490 ± 4 Ma respectively. The structure of the belt is dominated by northward- and southward-directed thrust and steep-dipping strike-slip faults. These structures are mostly attributed to terrane accretion which ceased prior to emplacement of the Late Silurian-Devonian Saint George Batholith. Preliminary chemical data indicate that the belt may represent the vestiges of an accreted island-arc volcanic sequence. If this interpretation is correct, it would be consistent with a multistage evolution of the Iapetus Ocean.