The Murray dyke swarm and its bearing on Cretaceous magmatism and tectonics in the Canadian Cordillera

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The Murray dyke swarm fed volcanism of the Spences Bridge Group, part of an Early Cretaceous continental arc overlapping the Intermontane terranes. Dykes are well-exposed in a 2x10 km area and strike to the north in a sheeted morphology, consistent with an extensional stress regime and rapid emplacement at 103.7 Ma, based on $^{40}\text{Ar}/^{39}\text{Ar}$ and U-Pb geochronology.

Dyke compositions range from mafic to felsic and were derived from the mantle. Dykes are dominated by three petrological groups unrelated through fractional crystallization. Two groups were generated by flux-melting above a steep slab; the other reflects infiltration of the arc by intraplate-composition melts generated during slab break-off.

Subsequent southwest-verging contraction folded the Spences Bridge Group and inverted its forearc basin to the west, shedding detritus that lapped onto the Group with angular unconformity. This evolution is consistent with accretion of the Insular terranes by east-dipping subduction, triggering orogenesis in the mid-Cretaceous.