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U-PB ZIRCON DATING OF THE SOUTH CONNEMARA GROUP, IRELAND, AND IMPLICATIONS FOR LATE STAGES OF THE IAPETUS OCEAN BASIN

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The South Connemara Group (SCG) is a succession of metamorphosed mafic volcanic and sedimentary rocks exposed along the north shore of Galway Bay in western Ireland. The contact between the SCG and the Proterozoic Dalradian Supergroup to the north is intruded by the younger Galway granite; to the west (Skird Rocks) the SCG is in fault contact with Dalradian metasedimentary rocks along a proposed continuation of the Southern Upland fault (Max and Ryan, 1975). The SCG may represent an accretionary complex formed above continent-directed subduction during closing of the Iapetus Ocean basin. Although microfossil fauna suggest a Middle Ordovician age, uncertainties on the stratigraphic relation of the microfossil assemblage to the rest of the SCG question the validity of proposed correlation with the Northern Belt of the Southern Uplands-Down-Longford (SUDL) terrane of Scotland and eastern Ireland (Williams et al., 1988). Here we provide the first isotopic dates from the SCG in order to test models of accretion and to investigate correlation within the Caledonian-Appalachian orogen.

We sampled meta-sandstone beds from the Golam (one sample) and Lettermullen (three samples) Fms of the SCG on Lettermullen Island, and a volcaniclastic turbidite deposit of the Gorumna Fm on Gorumna Island. U-Pb CA-ICPMS dating yielded maximum depositional ages (MDA) of 470 ± 2 Ma for the Gorumna Fm, 462 ± 2 Ma for the Golam Fm, and 457 ± 2 Ma – 439 ± 3 Ma for the Lettermullen Fm. All MDA are supported by weighted averages comprising at least 20 grains and with MSWDs close to 1.

These data indicate a range of Ordovician- and Silurian-age strata within the SCG; zSilurian ages are noteably younger than previous biostratigraphic ages. Our data support an interpretation that a mid-Ordovician seamount (Gorumna Fm; cf. Ryan and Dewey, 2004) and related turbidites were accreted to Laurentia together with late Ordovician and Silurian oceanic and continent-derived sediments (Golam and Lettermullen Fms). Accretion continued through Silurian times, contradicting previous correlation of the SCG with the Northern Belt , and indicates a duration of subduction that may have generated volcanism recorded in the Silurian sedimentary rocks that overlie the Laurentian margin. In this regard, the SCG may correlate with early strata of the Lettergesh Fm. in north Galway.