

Part 2 – 2010 Annual Sheriff Lecture – Student Abstracts

In the November issue of the Bulletin a number of student abstracts were published. A number of additional abstracts were received after the issue went to press. We are publishing these abstracts as a service to our members.

U-Pb Detrital Zircon Geochronology of Laurentian Margin Siliciclastics from Precambrian Rifting to the Mid-Ordovician Taconic Orogeny

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Paleogeographic reconstruction of the Newfoundland area suggests that various arc terranes developed during the opening of the Iapetus Ocean and development of the Cambro-Ordovician Laurentian stable continental margin. These terranes were then accreted to the continental passive-margin upon initial closure of the ocean basin in the Ordovician. The origin and age of these terranes are still questionable as they may contain older Precambrian basement according to some workers and, if so, they could be interpreted as originating from Laurentia or any other landmass bordering the Iapetus Ocean at that time. Newfoundland contains the northernmost extent of the Appalachian Orogenic Belt, which first developed during the Taconian Orogeny, a product of Iapetus Ocean closure in the Ordovician. The sedimentary packages of the Humber Arm allochthon were thrust upon the autochthonous sediment of the Laurentian passive-margin and deformed during the Taconic Orogeny. Measuring U-Pb isotope ratios of detrital zircons found in the syn- and post-rift siliciclastic strata may prove to be a useful tool in determining the source ages of the zircons deposit-

ed during stable margin development and perhaps identification of the origin and timing of the arrival of allochthonous terranes that first collided with the Laurentian margin. This interpretation will be based on correlation of the determined zircon ages to known source rock age signatures within the Laurentian continent during passive-margin evolution and to known source rocks of central Newfoundland allochthonous terranes. Preliminary age distribution data for detrital zircons of the Lower Cambrian Bradore Formation show a bimodal age distribution of 585 Ma and 1005 Ma (this study) which can be interpreted as sources derived from Grenville-age local terranes (1005 Ma) as well as younger, rifting-related volcanic and plutonic sources (585 Ma). Influx from these sources may be a result of the erosion of the younger, rift-related volcanic and plutonic source rocks as well as Grenville basement, exposed as the rift shoulder was uplifted. In this case, the rift shoulder would also have acted as a barrier to the continental sediment sources derived from the interior of Laurentia, which contain older Precambrian provinces. ■