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## GSA Connects 2022 meeting in Denver, Colorado

Paper No. 148-11

Presentation Time: 11:15 AM

### THE ROLE OF TRANSCURRENT STRUCTURES IN THE PALEOZOIC EVOLUTION OF THE NORTHERN LAURENTIAN MARGIN

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Several decades after Umhoefer (1987) highlighted the likely role of strike-slip displacement in the tectonic evolution of the North American Cordillera, debate over the importance of large magnitude translation of crustal fragments outboard of the Laurentian passive margins remains lively. Our recent studies suggest that strike-slip structures were instrumental in the development of the northern Laurentian margin. Devonian–Carboniferous conjugate sinistral and dextral strike-slip faults associated with formation and exhumation of ultrahigh-pressure units in North-East Greenland are interpreted to have accommodated late-stage lateral escape in the Caledonian collision similar to that observed in the hinterland of the modern Himalayan orogen. Ordovician–Devonian sinistral strike-slip faults of the Canadian Arctic transform system on the northern Laurentian margin truncated structures of the Caledonian orogen and resulted in large translation of allochthonous crustal blocks and arc fragments. The Peterson Bay fault zone at the southern margin of the Pearya terrane, Ellesmere Island, is currently one of the best examples of Paleozoic faults in the Canadian Arctic transform system. Near-vertical metamorphic tectonites in the fault zone record ductile deformation and metamorphism between 400 and 360 Ma. Although previously ascribed to vertical displacement related to collision and Ellesmerian shortening, the tectonites are best interpreted to have formed in a transpressional regime that accommodated sinistral translation of the Pearya terrane. Similarly, the Porcupine shear zone of northern Yukon and Alaska records ductile deformation responsible for westward Paleozoic translation of the North Slope subterrane. Both of these structures were extensively modified during reactivation and overprinting in the Mesozoic and Cenozoic. The younger displacement history is associated with opening of various basins within the broader Arctic Ocean. Transcurrent structures of northern Laurentia share characteristics with faults along other North American margins for which translational displacement histories have also been vigorously debated (e.g., Coast shear zone, Western Idaho shear zone, Wegener fault).

Session No. 148

[T31. Basin Analysis, Strike-Slip Faults, and Tectonics I: Honoring the Contributions of Paul Umhoefer](#)  
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