Paleo-Ballantyne Strait of the Sverdrup Basin - Late Paleozoic and Early Mesozoic Gateway to Alaska

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The Sverdrup Basin of Arctic Canada formed in Early Carboniferous and was an active area of subsidence and deposition until Late Eocene. Throughout the basin history, the main sediment source areas lay to the south and east and consisted primarily of Devonian clastic strata. From Carboniferous to Middle Jurassic, that is, previous to the opening of the oceanic Amerasia Basin, the Sverdrup Basin was flanked to the northwest by a land mass known as Crockerland. Facies relationships in the far northeastern portion of the basin, demonstrate that the Late Paleozoic - Mesozoic seaway continued northeastward between the two landmasses and linked up to the seaways in the Barents Sea region.

Before any well or seismic data were available, there was uncertainty regarding the continuation of the Late Paleozoic-Mesozoic seaway to the west past the present day Canadian Arctic Islands. The well and seismic data in the southwestern corner of the basin show that, from Carboniferous through early Middle Jurassic, the seaway did indeed continue to the west and that the basin axis in this area was oriented west-northwest. This axis now hits the current Arctic Ocean (Amerasia Basin) margin at right angles. Because this axis occurs within present day Ballantyne Strait, we have called the narrow seaway between the Paleozoic Fold Belt to the south and Crockerland to the north, Paleo-Ballantyne Strait.

The occurrence of this narrow seaway, which hits the Amerasia Basin at right angles, provides an important constraint on any proposed model for the opening of the Amerasia Basin. In any proposed reconstruction, a continuation of the seaway must be present on the crustal block which is placed adjacent to this portion of the Canadian Arctic margin. Notably, a very similar, narrow Late Paleozoic to Mesozoic seaway called the Central Chukchi Basin is present west of northern Alaska. The axis of the Central Chukchi Basin also hits the Amerasia Basin at right angles. Restoration of northern Alaska and adjacent northeast Russia against the Canadian margin by clockwise rotation results in a perfect match of these two basin axes. It seems reasonable to conclude that the Amerasia Basin opened by counterclockwise rotation and that Paleo-Ballantyne Strait was the Gateway to Alaska. Given this, the geology of the southwestern Sverdrup Basin has much to offer those who are contemplating exploration in the Chukchi Basin.