

**THE EASTERN HUDSON BAY ARC, CANADA: PART OF A MULTI-RINGED IMPACT BASIN.**

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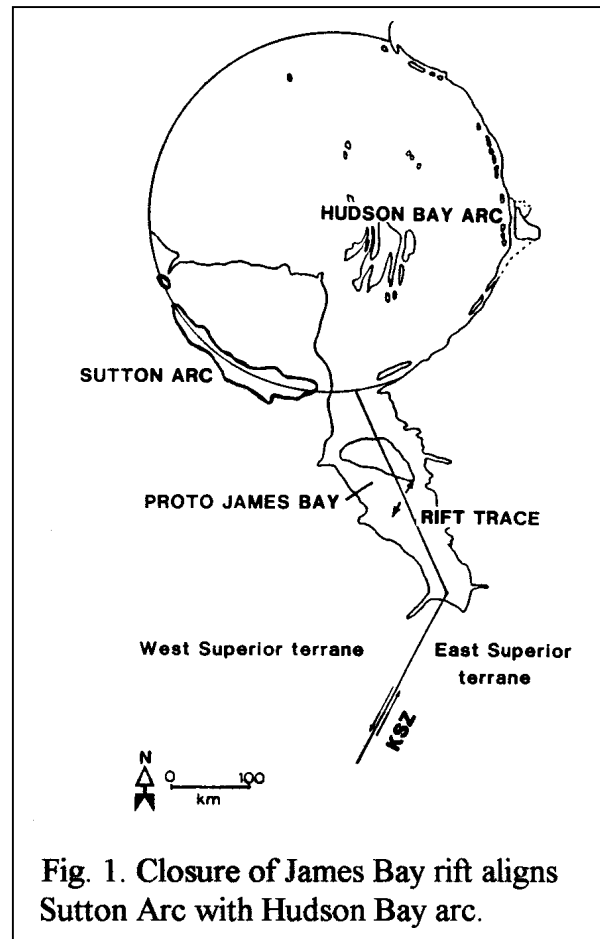
Almost 35 years ago, Beals [1] proposed an impact origin for the great eastern arc of Hudson Bay, which extends for almost 650 kilometres through an angle of 155 degrees and has a coherent circular raised rim on its landward side. A rift extends at right angles outwards on the southeastern side and within the arc, the basin is filled with Proterozoic sediments. The best fit circle has a radius of 230 kilometres and the arc deviates from this circle by less than 10 km along its entire length. More recently, Goodings and Brookfield [2] noted that closing the James Bay rift aligns the Sutton ridge to form an arc of 240 degrees, or two-thirds of a circle (fig. 1). The remainder is cut by the younger circular northern James Bay cratonic basin.

Apart from impact, no other plausible explanation has been proposed for this great ring fracture (and another ring fracture may exist outside this one). But, because no definitive evidence of impact was found, little has been published on the Hudson Bay arc since 1968. Recent studies of multi-ringed basins on other planets, and of other large, old, multi-ringed basin, such as Vredefort, on Earth, provide criteria for re-investigation and re-interpretation of published reports. Along the Hudson Bay arc, bodies of pseudotachylite, monomict and exotic breccias are associated with faults, and overlying sediments may show evidence of re-worked impact melts.

If ongoing investigations are positive, Hudson Bay arc would form part of the largest identified multi-ringed impact on Earth, with a minimum diameter of 450 kilometres.

[1] Beals, C. S. (1968.) In: Beals, C.S. (editor), Science, History and Hudson Bay, volume 2. Department of Energy Mines and Resources, Ottawa., 985-999.

[2] Goodings, C.R. and Brookfield, M.E. (1992) *Earth-Science Reviews*, 32, 147-185.



**Fig. 1. Closure of James Bay rift aligns Sutton Arc with Hudson Bay arc.**