

TERRANES AND THE ORIGIN OF THE PACIFIC BASIN

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The hypothesis that the Pacific margins of North America and East Antarctica/Australia originated as a conjugate rift pair at the end of the Precambrian (Moore, Geology, 1991; Dalziel, Geology, 1991), whether or not correct, provides a new perspective on circum-Pacific terranes. While late Precambrian rifting and Cambrian marine transgression have long been regarded as significant events in the history of the Antarctic and Australian margins, the convergent tectonics of the Cambro-Ordovician Ross-Delamerian event tends to overshadow this extensional phase in the literature. Likewise, early Paleozoic convergence along the western edge of the South American craton has tended to obscure evidence of late Precambrian to early Cambrian extension and marine transgression that makes the proto-Andean margin a possible counterpart for the early Appalachian margin of North America (Bond et al., Earth and Planetary Science Letters, 1984; Dalziel, Geology, 1991). Paleomagnetic data of sufficient quality to position North America with respect to Gondwana for the period prior to the mid- to Late Cambrian do not exist. Late Cambrian poles suggest that by that time the incipient Pacific Ocean basin was 9,000 km wide, and that there was an ocean (southern Iapetus) 1,700 km wide between North and South America.

Lithospheric units of a sub-continental scale (i.e. terranes) have clearly played a critical role in the development of the Pacific Ocean basin since its inception. Consideration of the major continental masses is needed to put this role in perspective.