

# Phanerozoic Development and Breakup of Gondwanaland

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The original type-section of the 'Gondwana system', first described in 1879, is located in India and forms a more or less continuous succession from upper Carboniferous to lower Cretaceous. Subsequent studies showed the existence of similar rock formations in South Africa, South America, Antarctica, Australia and other areas, all of which contain common flora and fauna – of particular relevance being the widespread occurrence of the Late Carboniferous thick-shelled bivalve *Eurydesma* and the Permian-Carboniferous plant *Glossopteris*.

In 1885 Eduard Suess suggested the past unity of three of these continental masses within a supercontinent. Thirty years later Alfred Wegener extended Suess' concept to include Australia and Antarctica, after *Glossopteris* had been discovered during Scott's 1910-1913 Antarctic Expedition.

This account of Gondwanaland is extracted, with the permission of John Veevers, from - J. J. Veevers, Gondwanaland from 650-500 Ma assembly through 320 Ma merger in Pangea to 185-100 Ma breakup: supercontinental tectonics via stratigraphy and radiometric dating. *Earth-Science Reviews* 68 (2004) 1-132.

Gondwanaland existed for over 500 million years – from the late Neoproterozoic–Cambrian (650–500 Ma) amalgamation of African and South American terranes to Antarctica–Australia–India through mid-Carboniferous (320 Ma) merging with Laurussia in Pangea to the final (and now well-documented) breakup which lasted from 185 to 100 Ma (Jurassic and Early Cretaceous).

The first clear picture of Gondwanaland, in the Cambrian, shows the assembly of continents with later Laurentian, European and Asian terranes along the “northern” margin, and with a trench along the “western” and “southern” margins, reflected by a 10,000-km-long chain of 530–500 Ma granites. The interior was crossed by the Prydz–Leeuwin and Mozambique Orogenic Belts. The shoreline lapped the flanks of uplifts generated during this complex terminal Pan-Gondwanaland (650–500 Ma) deformation, which endowed Gondwanaland with a thick, buoyant crust and lithosphere and a nonmarine siliciclastic facies.