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The history of the Gondwana continent and the chronology of break-up

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The similarities between the geology of India, Africa, South America and Australia had been recognised before Wegener's dramatic suggestion of a united continental mass, and it was the Late Paleozoic and Early Mesozoic correlations across the Gondwana continental interior that dominated discussion for over fifty years. The advent of plate tectonics not only provided a model for break-up but also drew attention to the problems of the growth of Gondwana and the nature its outer margins, some of which had to have been convergent. In a similar fashion the history of break-up has tended to focus on the Jurassic break-up of the stable continental interior and the creation of passive margins in India, East Antarctica, South America, Africa and Western Australia. This focus may be the origin of the suggestion that post-Jurassic rocks be removed from the Gondwana map.

Removing post-Jurassic rocks from the Gondwana map may be a logical decision in the 'heartland areas' but it is neither helpful nor practical near the Pacific margin where the creation, though subduction, of substantial bodies of new continental crust during the Mesozoic can be demonstrated. Australia provides a telling example. There are a strong dynamic differences between the western margin of Australia that shows early break-up and the southern Australian margin where there was slow extension within the continental crust until the Cretaceous. On the eastern (Tasman Sea) margin break-up was delayed until Late Cretaceous and the northern margin is still convergent. In New Zealand, and much of West Antarctica, subduction continued until 105-100 Ma and into the Cenozoic in the Antarctic Peninsula. Thus excluding post-Jurassic rocks would require the drawing of a boundary through growing accretionary complexes or subdividing suites of granites. Similar problems may affect the Pacific margin of South America. Because these are areas of new continental crust, removal would involve changing the outline of the continent.

If break-up is diachronous then the boundary between Gondwana and post-Gondwana rocks must also be diachronous. A possible solution is to consider the problem on a regional basis. On a regional scale, the distinction may be drawn on whether particular groups of rocks pre-date or post-date break-up in that region. Rocks that post-date break-up, a fact that is usually well understood by people working within a region, can be excluded from Gondwana and the Gondwana map.

