

Mesozoic to Tertiary Evolution of the Antarctic Peninsula Magmatic Arc.

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The Antarctic Peninsula magmatic arc is built, at least in part, on continental crust with a record of magmatism and metamorphism that stretches back to Cambrian times. Knowledge of its history is being revised and extended with the application of U-Pb zircon chronology, and it is now seen as the product of distinct processes of magma generation that changed with the prevailing tectonics of Gondwana break-up and dispersal. The early stages of plutonism consist of Late Triassic S-type granites and migmatites (ca. 227 Ma), mostly exposed in Palmer Land and generated by anatexis of the middle/upper crust; metaluminous granitoids appear at ca. 205 Ma. Jurassic magmatism is widespread: volcanic rocks and sub-volcanic granites occur throughout the eastern and southern parts of the peninsula. This activity, which migrated westwards from 185 to 155 Ma, represents lower crustal melting in response to the rifting and initial break-up of Gondwana, apparently under the thermal influence of the Karroo mantle plume. The main phase of 'Andean' magmatism followed, from Early Cretaceous to Eocene times (140-50 Ma), and resulted in the construction of the Antarctic Peninsula batholith along the western side of the peninsula. This mainly corresponds in time to the active margin batholith of Patagonia, but in the northern Antarctic Peninsula there is a significant westward shift in the locus of the batholith with time. Subduction-related magmatism ceased progressively northwards during the Palaeogene, as sea floor became welded