Between Ross and Scotia Sea, Antarctica comprises one of the best records of the active margin of Gondwana. A major product of the subduction process of the Paleo-Pacific under the East Antarctic craton is the Early Palaeozoic Ross Orogen, a 3 000 km long Andean-type mountain belt with well defined plutonic arc and a subduction-related suture in its northernmost part, North Victoria Land. The six papers in this chapter deal with various aspects of this orogen. Finn et al. (Chap. 4.1) investigate the cratonic interior of the active margin. The authors use data not only from Antarctica, but also from the adjacent Australian Gondwana fragment for their reconstructions. They use two geological fix-points in the Miller Range (Central Transantarctic Mountains) and on the Wilkes Land coast, the better known geology of the Australian cratonic areas as well as satellite and airborne magnetic data to characterize and delineate major cratonic subunits (e.g., Mawson craton). The outer boundary of the thick cratonic crust, just in the location of the linear belt of the Ross Orogen, later becomes the supposed western limit of Palaeozoic and Jurassic volcanism.

The remaining papers deal with Ross orogenic features in the Transantarctic Mountains south of Victoria Land and in northern Victoria Land. Stump et al. (Chap. 4.3) have studied a major boundary across the orogen in the Byrd Glacier area. This boundary between different rock units is interpreted as the result of a left-lateral transpressive terrane accretion of the “Beardmore microcontinent”. The interpretation decouples a tectonic Ross Orogeny at 550 Ma from the arc plutonism at 500 Ma.

Gootee and Stump (Chap. 4.4) present a detailed account of the Cambrian, mainly sedimentary units south of the Byrd Glacier discontinuity. The paper thus provides background to the above interpretation of the Stump et al. paper.

In North Victoria Land, Läufer et al. (Chap. 4.5) add new data to the earlier published model of a bilateral thrust system with ocean-ward directed tectonic transport in the east and craton-ward transport in the west. The entire, 500 km wide part of the Wilson terrane west of the Matusevich Glacier is interpreted as a system of thrust sheets detached from the main Wilson terrane after the arc plutonism and therefore of late Ross age.

Adams (Chap. 4.6) takes up an earlier discussion of the K-Ar pattern in North Victoria Land by adding new data from the Terra Nova Bay area and the Oates Coast. The interpretation uses the bilateral thrust set-up discussed above by Läufer and Kleinschmidt to explain the age pattern as a result of a “pop up” structure along the thrust system.

The hypothetic Matusevich Glacier Fault on the Oates Coast has also been taken as part of the above thrust system. Based on a detailed analysis of small scale structures in the area, Kleinschmidt and Läufer (Chap. 4.2) have now shown that there is a younger brittle dextral strike-slip element present. A parallel dextral strike-slip system is present in the Rennick Glacier area. As both faults have the same strike as offshore fracture zones, a possible connection between them is discussed. This leads to the principal question: Can offshore transform faults continue onshore. An additional problem is the fact that the onshore structures are dextral, the offshore transforms, however, sinistral.

Unfortunately, in this chapter there is no contribution on the spectacular high-pressure suture in the Lanterman Range of North Victoria Land.