GEOLOGIC STRUCTURE OF PRINCE OLAV COAST, EAST ANTARCTICA —WITH SPECIAL REFERENCE TO CORRELATION WITH THE LUTZOW-HOLM BAY REGION

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Structural characteristics of the high-grade metamorphic rocks exposing along the Prince Olav Coast (68°— 69° S in latitude, 40°— 45° E in longitude) and around the Lutzow-Holm Bay region (69°— 70°S 37 — 40 E) are correlated. In the Prince Olav Coast, the strikes of the main foliation (S1) trend predominnantly NW—SE to NNW—SSE. Megascopic and mesoscopic isoclinal and tight folds are found in many ice-free areas. The axial traces of these folds are bent by the later deformation. Thus, two phases of folding are recognized: isoclinal to tight (occasionally recumbent) folds with approximate NW-SE axial trace(F1), and tight to open folds with NE-SW to ENE-WSW axial traces (F2).

Mineral lineation which is defined by the dimensional preferred orientation of sillimanite, hornblende and biotite shows the similar direction to that of the F1 fold axis, representing the earlier F1 fold occurred in the peak of the main regional metamorphism. The later F2 fold may result from the deformation at the time of decending temperature of the main metamorphism. These deformations do not affect the early Paleozoic granite and pegmatite and also thermally metamorphosed mafic dike rocks. Many joints and fractures with nearly vertical planes appear to be conjugated are observed in may places. The direction of maximum compressive strees may be approximately E-W to NE-SW.

In the Lutzow-Holm Bay region, three stages of megascopic folds, F1, F2 and F3, have been distinguished. F1 is characterized by an isoclinal recumbent fold with N-S axial trace, F2 is an open fold with E-W axial trace and F3 is also an open fold with N-S axial trace. The modes and succession of the deformations in he Prince Olav Coast are analogues to those in the Lutzow-Holm Bay region, although F3 has not been recognized in the former region. Therefore, the structural evolution as well as metamorphism throughout the Prince Olav Coast and Lutzow-Holm Bay regions (Lutzow-Holm Complex) are common.

General trends of the conspicuous structural elements may be traceable to the counterparts of the Gondwana fragments.