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DEFINITION OF FOLD ELEMENTS IN THE VICINITY OF LÜTZOW-HOLM BAY AND PRINCE OLAV COAST, EAST ANTARCTICA (ABSTRACT)

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Granulite- to amphibolite-facies metamorphic terrain lies on the coastline of Lüzow-Holm Bay (LHB) and Prince Olav Coast (POC). To examine as to whether there are distinct difference in the mode of deformation from place to place, we studied fold structures of the LHB and POC regions during JARE-33 and -34. Here we define five fold elements, F_{n-2}, F_{n-1}, F_n, F_{n+1} and F_{n+2}, in developing order.

F_n folding: F_n folds are isoclinal and generally overturned (recumbent) folds with subhorizontal fold axes, and were dominantly developed in such area as Botnnuten, Rundvågshetta, Berrodden, Skallen, Austhovde, Padda, Skarvsnes, Breidvågnipa, the Ongul Islands, Akarui Point, Kasumi Rock and Cape Hinode. The plunge of F_n folds is generally parallel to those of the dominant mineral lineation (L_n) defined by sillimanite, orthopyroxene, hornblende, feldspar and quartz. Aligned biotite grains in garnet-biotite gneiss show axial plane foliation of the F_n fold except at the Rundvågshetta region where they crosscut the axial surfaces of F_n folds. The wavelength (up to hundreds of meters) depends on the layer thickness, implying that F_n folds were buckled folds. Thus asymmetry of smaller-scale folds indicates the larger regional enveloping surfaces. In Skarvsnes, the F_n folds partially exhibit sheath shapes. The F_n folds were clearly refolded by gentle folds.

Post-F_n folding: Gentle folds commonly developed in the same areas where F_n folding are observed. These gentle folds have subvertical axial planes and subhorizontal fold axes and are characterized by buckling (up to 5 km in wavelength). Two stages of gentle-folds are recognized in Botnnuten, East Ongul Island, Akarui Point and Kasumi Rock as well as Skarvsnes and Skallen (T. ISHIKAWA: Mem. Natl Inst. Polar Res., Ser. C, **9**, 1, 1976; M. YOSHIDA: J. Geosci., Osaka City Univ., **21**, 65, 1978). This suggests that development of gentle folds of two deformational stages (F_{n+1} and F_{n+2}) succeeded to the intense F_n folding in the LHB and POC regions. In Botnnuten, Skallen, Austhovde, Padda, Skarvsnes, the Ongul Islands, Akarui Point, Kasumi Rock and Cape Hinode, these fold axes are subparallel to those of F_n folds. In addition, the gentle folding interfered dip angles of aligned biotite grains except in Rundvågshetta where biotite shows axial-plane foliation of gentle folds. The plunges of fold axes of F_n folds and L_n mineral lineation are disturbed in Botnnuten, Berrodden, Skallen, Skarvsnes, the Ongul Islands, Akarui Point and Kasumi Rock where gentle folds oblique to F_n folds were developed. In these regions, dome and basin structures are recognized, besides previous study showed similar interference pattern in Sinnan Rock (Y. HIROI *et al.*: Geological Map of Sinnan Rocks, Antarctica. Antarct. Geol. Map Ser., Sheet 14. Tokyo, Natl Inst. Polar Res., 1983).

Pre-F_n folding: F_n folds partially deformed pre-F_n folds (F_{n-1} fold) in Rundvågshetta, Berrodden, Skarvsnes, East Ongul Island, Kasumi Rock and Cape Hinode. They are isoclinal folds which have fold axes subparallel to those of F_n fold. The wavelength ranges

up to a few meters. F_{n-2} folds are isoclinal folds refolded by F_{n-1} folds. The F_{n-2} folds are observed only in one outcrop of Rundvågshetta. Axial surfaces of F_{n-1} and F_{n-2} folds are crosscut by aligned biotite grains.

Conclusions are summarized as follows,

(1) The metamorphic terrain of the LHB and POC regions may be termed a recumbent gneiss terrain.

(2) Not only isoclinal folds but also gentle folds are widespread over the LHB and POC regions, and there is no distinctive difference between the LHB and POC regions with respect to the mode of fold structures.

(3) F_n folding is not an initial deformation in the LHB and POC regions, but postdated earlier folding (F_{n-1} and F_{n-2}).

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