RELICT KYANITE IN THE HIGHLAND AND SOUTHWEST GNEISSES IN SRI LANKA: EVIDENCE OF PROGRADE METAMORPHISM AND A CHARACTERISTIC IN COMMON WITH THE LUTZOW-HOLM COMPLEX IN EAST ANTARCTICA

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Relict kyanite has been found in three Sri Lankan granulite-facies pelitic gneisses. Two of them belong to the Highland Group (from Teldeniya and Gampola) and the rest to the Southwest Group (from Horana). Therefore, it is evident that both the Highland and Southwest Groups progressed from the kyanite to the sillimanite stability fields. Kyanite always occurs as inclusions in garnet grains and is often associated with spinel, suggesting that it was formed locally as a breakdown product of staurolite in the absence of quartz.

One specimen from Teldeniya is typical khondalite and contains staurolite and corundum in addition to kyanite. These minerals also occur as inclusions in garnet grains and are completely separated from quartz. The staurolite is unusually rich in Al and Ti and poor in Si. Such a chemical feature of the staurolite is in common to world-wide granulite-facies staurolites. The corundum + almandine assemblage is stable at high-pressures relative to the chemically equivalent hercynite + sillimanite assemblage. Therefore, it is suggested that the rock was once in the corundum + garnet stability field.

Every garnet in the metastable kyanite-bearing rocks shows systematic change in composition. Ca content gradually decreases from the core to the rim, though Mg/(Mg+Fe) ratio is nearly constant. Moreover, garnets in the rock from Horana are often replaced partly by cordierite with or without spinel. These chemical and textural features suggest nearly isothermal decompression.

Thus, the occurrence of relict minerals and other features of the granulite-facies rocks suggest changing P-T conditions during prograde metamorphism; from earlier relatively high-pressure and low-temperature conditions to later lower-pressure and higher-temperature conditions.

These features except for the replacement of garnet by cordierite in Sri Lankan high-grade pelitic rocks are in common with those observed in the granulite-facies pelitic rocks of the Lutzow-Holm Complex in East Antarctica.