SUB-DIVISION OF THE GRANULITE FACIES IN SRI LANKA AND ORIGIN OF THE GEM MINERALS OF THE ISLAND

D. J. A. C. Hapuarachchi

48/14, Old Kesbewa Road, Nugegoda, Sri Lanka.

Sri Lanka has long been renowned for the variety and abundance of its gemstones which are found in the gem gravels of the island. Of these gem minerals the most notable and most abundant are those of the corundum group. To determine the ultimate origin of the corundum we would have to turn our attention to the occurrences of corundum-bearing rock within the Highland Series reported at Talatu Oya, Haldamulla and Gangoda, These are silica-deficient pelitic rocks consisting of minerals such as corundum, biotite, sillimanite, perthitic K'feldspar, plagioclase, spinel, cordierite.

Speial features of these corundum-bearing granulites in thin section are noted. The importance of these feauc es is that they afford clear evidence of a reaction between biotite and sillimanite in the absence of quartz ortproduce corundum and K' feldspar with spinel or cordierite, a metamorphic reaction of great significance fot Sri Lankan geology, ecnomic and petrologic. The association biotite-sillimanite in silica-deficient pelitic rocks is stable in the garnet-biotite division of the hornblende-granulite subfacies but evidence of it instability sr scleaily indicative of a change in metamorphic conditions,the trend of the above-mentioned reaction being towards the elimination of biotite or sillimanite or both with the production of corundum-bearing assemblagei marking a change in the granulite paragenesis. To accommodate these corundum-bearing rocks (corundum granulites) it is necessary to erect a new sub-division of the cordierite division of the hornblende-granulite subfacies, namely. the corundum sub-division covering the lower part of the P-T field of the cordierite division as shown and representing the lowest pressures in the granulite facies. A further subdivision of the cordierite division, namely, the biotite-sillimanite sub-division covering the upper part of the field of the cordierite division, becomes necessary to accommodate cordierite-granulites from regions where biotite-sillimanite is stable and no corundum-bearing granulites are present as in the south-west of the sland. These new sub-divisions are cut by the wollastonite reaction curve and the sillimanite-andalusite boundary and the significance explained. With the introduction of two additional sub-divisions, a nine-fold sub-division of the granulite facies (formerly seven-fold) is now proposed for Sri Lanka rocks.

The corundum sub-division of the granulite facies is the birth place and home of the sapphires and rubies and other corundum minerals of Sri Lanka. The corundum-bearing country rocks and associated rocks belonging to the Highland Series have all been eroded away and are not found today except ofcourse for thost remnant occurrences of corundum-bearing granulite above mentioned which I believe are only traces of whae might be an isogradic surface marked by the corundum-producing reaction. Origin of taffeite, kornerupine, sapphirine is also discussed in comparison with other granulite terranes of Gondwanaland.