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Low-pressure re-metamorphism of granulite and orthogneiss complexes in the Křišťanov and Prachatice Massifs (southern Bohemia)

THE pre-Cambrian Moldanubian Křišťanov Massif consists largely of granulite-facies granulites containing kyanite and garnet with or without biotite and sillimanite, and biotite–garnet orthogneisses (Frejvald, 1970, 1974). Similar rocks comprise the Prachatice Massif. Some of the rocks show re-metamorphism in a younger event of probable Variscan age.

This note describes the characteristic features of the later metamorphism:

Slightly altered kyanite–garnet–biotite±sillimanite granulites and biotite±garnet orthogneisses develop cordierite–biotite±sillimanite mineralogy or quartz–biotite symplectite. Cordierite (or sericitized cordierite) grows at the expense of pre-existing biotite, sillimanite, and garnet. New biotite or quartz–biotite symplectite forms by recrystallization of biotite-rich foliae in the granulite gneisses and, in part, at the expense of garnet and cordierite. In some granulite gneisses garnet appears to break down to cordierite and sillimanite. The status of sillimanite in the biotite-rich foliae is uncertain.

Granulite-gneisses and orthogneisses extensively altered in the younger event show an increase in grain size and the assemblages cordierite–biotite–muscovite or cordierite–biotite–porphyroblastic-microcline (with or without muscovite and plagioclase, An 12 to 18). Original biotite-rich foliae are dispersed in the recrystallization. Muscovite forms at the expense of cordierite and both generations of biotite.

The rare acid granulites also show increased grain size as a result of the younger event and develop cordierite–microcline mineralogy with minor muscovite, biotite, and plagioclase, An 12 to 18.

Thoroughly recrystallized biotite–garnet orthogneisses have a small grain size and develop a plagioclase(An 15 to 20)–microcline–biotite assemblage. Biotite-rich foliae develop a pronounced schistosity.

Thus the character of the re-metamorphosed rocks depends partly on their original mineralogy and partly on the degree of deformation during the younger event. The second metamorphism seems to be of a low-pressure and high-temperature or water-deficient character.

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