In order to better characterize the different metagranites of the MGM, a geochemical study was carried out. The volumetrically dominant Jelen grad type defines a coarse grained, K-feldspar phyric, S-type granite suite. Fine grained metagranites (Garić-grad type) show the characteristics of A-type magma.

The metamorphic evolution of the MGM was studied on metapelites. From the observed peak paragenesis (Crd-Grt-Kfs) and electron microprobe data it can be concluded that the Cretaceous metamorphism was of the low-pressure type reaching granulite facies conditions of ca. 750 °C and 3–4 kbar. A retrograde metamorphic event, mainly caused by heat and fluid input from the Central Granite, occurred at lower amphibolites facies conditions (500–600 °C, 1–2 kbar).

As yet there are no clear evidences for a Variscan tectonothermal event in the MGM. However, Permian magmatism or anatexis in the lower crust is indicated by inherited Permian zircons in the Central Granite. Relics of Permian monazite found in one sample of metapelite document a Permian phase of metamorphism in the metamorphic series of the MGM.

The high heat flow regime of Cretaceous age is unique in the basement of the Pannonian Basin and may be a local feature triggered by a mafic intrusion in the lower crust.

Petrographic, geochemical and physical methods used for determination of provenance of Czech marbles

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A large number of provenance studies have been published since the 1980s dealing with marbles of the Mediterranean area, in which the methodologies and characteristics were examined in detail. However, available data and comparative studies from other areas are still absent. The major aim of this extensive study, which has been started in late 1990s, consisted of distinguishing the different marble types of the Czech Republic by means of petrographic, geochemical and physical criteria. It includes quantitative approaches, comparing the data from the studied quarries with the properties of artefacts, and evaluating the examined methodology for the study of marble provenance. The work is part of an interdisciplinary research project entitled ‘Lithotheque of Czech historical dimension stones’.

The geological situation of the Bohemian Massif (Czech Republic) is very complicated in terms of the various tectonometamorphic and magmatic events that have affected these rocks. The various sedimentary limestones were metamorphosed to form crystalline limestone lenses within metasedimentary rocks, at ages ranging from the Proterozoic to the Lower Palaeozoic. These metamorphosed carbonates were, and still are, of special interest in the production of milled, crushed, and dimension stones worked in the Czech Republic, as well as in some bordering countries.

As the result of the continuing research, the new data were gathered from the southern and western part of the Bohemian Massif. The studied marbles were distinguished with the aid of combinations of following petrographic, geochemical, and physical techniques: optical microscopy, petrographic image analysis, cathodoluminescence, stable isotopic analysis and magnetic susceptibility. Data interpretation has allowed to characterize the marble types on the basis of the mineral assemblage, fabric parameters (carbonate grain size and carbonate grain shapes, index of grain size homogeneity, shape preferred orientation), the fabric of cathodomicrofacies, values of C and O isotope ratios ($\delta^{13}C$, $\delta^{18}O$) and values of the mass specific magnetic susceptibility. This approach has been found to be useful for fingerprinting calcitic, dolomitic and impure marbles, including rocks involved with various degrees of deformation.