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Provenance and characteristics of rocks used for the construction of the Teplá

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The buildings of the famous Norbertine (Premonstratensian) monastery of Teplá in the Karlovy Vary district in the western Czech Republic were constructed with local and partly imported stone materials over a time span of more than 800 years.

The provenance of the rock materials were investigating by a petrographical study of the building stones and plaster, evaluation of actual and historical literature and maps, archive studies, field work including geological mapping, comparative studies of regional historical monuments and “discoveries by chance” through contacts with the former German population of the area and the actual citizens of the sites.

Within a research project funded by DBU (German Federal Environmental Foundation, Az: 20725), the “Freunde des Stifts Tepl zu Esslingen e.V.” and the Czech Monument Protection Authorities and the TU München the investigations focussed on the subvolcanic trachyte, which is a fairly rare dimension stone, but occurs on the former ground of the monastery at different sites. It was exploited in a single quarry at the Špičák hill some 3 km east of the building site since the foundation of the Teplá monastery in 1193. This quarry is still active today and is run by the company Bögl & Krysl, a German-Czech joint venture. The rock is available on the today´s market as “Teplá trachyte” and mainly used as slabs for facades, but also as intersection material for historical monuments in the Czech Republic, the Netherlands and Germany. The Teplá trachyte is a massive, bright yellowish to greyish magmatic rock which consists

mainly of alkalifeldspar.

Gneisses and micashists of the Teplá crystalline complex were used especially for the baroque walls of the convent buildings and for the coverage of plasters. The less favourable shape of these field stones made them a perfect material for the lime mortar bound wall constructions and walls. The more massive granite was used for the reinforcement of the northern walls of the church to avoid the collapse of the walls during the construction of the new library.

A bright oolithic limestone was used for the Neoromanic western portal of the church which was added in the late 19th century and for statues on the gable and the supraportas of the new museum and library building. The fine grained oolithic limestone has a dolomitic matrix and even the cores of the ooids consist of dolomite. Sedimentary structures such as cross beddings can be found on the portal of the church and on the statues. According to original invoices the limestone is called “Morley”, which is a variety of the lower Jurassic “Savonnieres limestone”, which was very popular in the late 19th century in Central Europe.

Conglomerates and sandstones were used in the Gothic parts of the church and for the basement of the Baroque buildings in the monastery. These sediments can be found in the Molasse type Permocarboniferous basin of Manětín. These are the erosional materials of the rising Variscan orogener and consist maily of quartz, black lydites, sandstones and greywakes. The matrix is siliceous and so fairly unaffected by weathering.

Marble was only used to a minor extent as raw material for the lime production. The walls of the baroque buildings were built by micashist, gneiss, bricks and lime mortar. Since limestone is almost absent in this region, marble from nearby marble occurrences in an amphibolitic rock series of the Marianské Lazne complex were used.

In the interior of the monastery and in particular in the church, a vast number of different rocks such as limestones, marbles and Serpentinite were used, which derive from Czech Republic, Germany, Austria, Hungary and Italy.