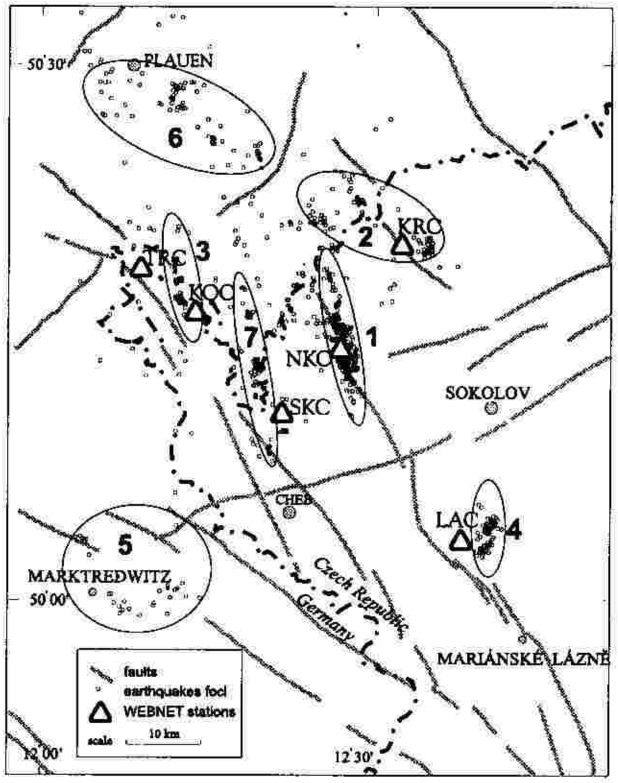

Fig. 1. Map of epicentres of microearthquakes which occurred in West Bohemia/Vogtland/NE Bavaria since 1991. Focal zones numbered 1–7: 1 = Nový Kostel area, 2 = Kraslice-Klingenthal area, 3 = Kopaniny area, 4 = Lazy area, 5 = Marktredwitz area, 6 = Plauen area, 7 = Plesná area.

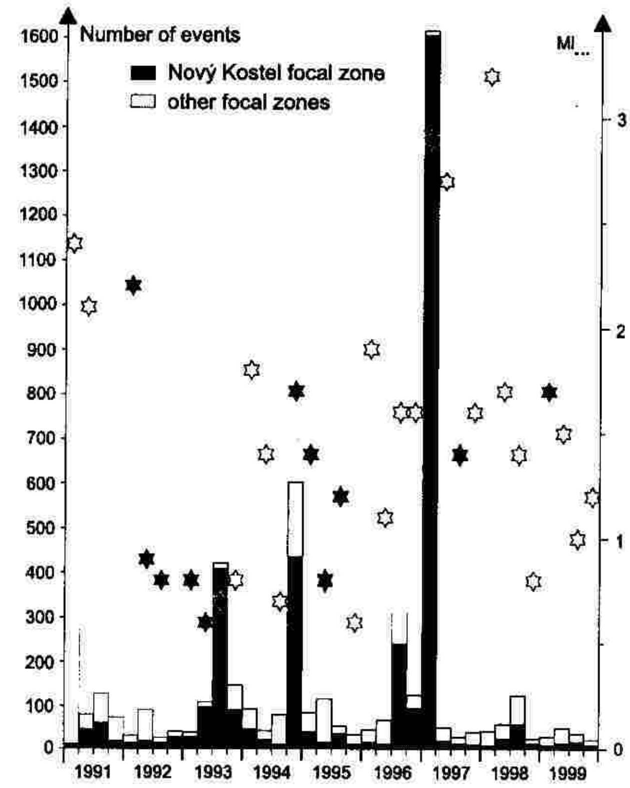

Fig. 2. Histograms of events which occurred in Nový Kostel area and other focal zones since 1991.

Metamorphic Zoning in the Polička Crystalline Unit

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The Polička crystalline unit (PCU) is a metamorphosed volcano-sedimentary complex situated in the E part of the Bohemian Massif. The PCU is composed of different gneisses containing intercalations of amphibolites, quartzites, mica-schists, marbles and calc-silicate rocks. Dominant gneisses and mica-schists can be divided into two chemically different groups. The first group (metagreywackes) is characterised by uniform mineral assemblage: Q + Pl + Bi ± Mu ± Grt ± Chl; staurolite is also locally present in the eastern part of the PCU. The second group (metapelites) is important for the study of metamorphic zoning. Metapelites form small lenses and strips in metagreywackes parallel to the foliation in the PCU (strike NW–SE). In the north-eastern part of the PCU, the mineral assemblage of metapelites (mica-schists) is: Q + Mu + Bi + St ± Pl ± Grt ± Ky ± Il ± Mg; late chlorite (after biotite) is locally formed along rock cleavage. The mineral assemblage: Q + Pl + Bi ± Sill + Grt ± Mu ± Kfs ± Il ± Tour is typical in other parts of the PCU.

Three metamorphic zones of Barrovian regional metamorphism can be distinguished with an increasing grade from staurolite zone in the NE across kyanite zone to sillimanite zone in the southern PCU. Near the NW margin, the old regional metamorphism in rare interbedded metapelites was overprinted by young contact metamorphism, and cordierite-bearing rocks with mineral assemblage Q + Pl + Cor + Grt + Bi originated.

Chemistry of rock-forming minerals from staurolite to sillimanite zones was studied by electron microprobe. Biotite shows variation in the Fe/(Fe+Mg) ratio of 0.47–0.51 in the staurolite zone to 0.50–0.58 in the sillimanite zone. Muscovite contains different amounts of paragonite component Na/(Na+K) of 0.21–0.24 in the staurolite zone to 0.19–0.12 in the sillimanite zone; ranges of the phengite components are similar (Si^{IV+}= 6.19–6.28). Oligoclase displays elevated anorthite component from the staurolite zone (An_{13}) to sillimanite zone (An_{30-16}). Garnet from the staurolite zone has composition Alm_{75} Py_{13} Spe_{9} Gr_{3} in core and Alm_{79} Py_{14} Spe_{4} Gr_{3} in rim. Two types of garnets of different but weak zoning patterns occur in the sillimanite zone. The first one is characterised by increase in Ca from core to rim and has composition Alm_{69} Py_{15} Spe_{13} Gr_{3} in core and Alm_{73}

Py_{16} Spe_8 Gr_2 in rim. The second one displays reversed Ca evolution with the composition Alm_{71} Py_{12} Spe_{15} Gr_2 in core and Alm_{72} Py_{13} Spe_{12} Gr_3 in rim.

The P-T conditions estimated from the sillimanite zone: metapelite garnet–biotite thermometry (Williams and Grambling 1990) indicate temperatures between 606–623 °C and garnet–plagioclase–aluminium silicate–quartz (GASP) geobarometry (Koziol and Newton 1988) shows pressures of 4–5 kbar. These data, however, were very likely reequilibratied during cooling. The peak temperature based on the mineral association (Grt-Bi-Sill) was higher by 30–80 °C at the pressure of 5 kbar. The couple garnet–biotite from the staurolite zone indicates temperatures between 483–474 °C at pressures of 4 kbar.

Metamorphic zoning in the PCU is a product of at least two metamorphic events. The Barrovian metamorphism under conditions of the amphibolite and epidote amfibolite facies was locally overprinted by contact metamorphism.

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Rhyolite Related to Panafrican Granite in the Brno Massif (Czech Republic)

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The Brno massif is Cadomian, mostly magmatic unit situated at the eastern margin of the Bohemian Massif. It is formed by East and West granodiorite areas, which are tectonically separated by the Central Basic Belt. Whereas eastern part of the Brno massif is built by I-type granodiorites and tonalites, the granites, granodiorites, tonalites and diorites of the western part are more akin S-type. The Central Basic Belt consists of the (meta-) basalt subbelt i the east and the diorite one in the west (Zapletal 1928).

Rocks of the Brno massif are cut by rhyolitic subvolcanic dykes, whose thicknesses typically range from first tens of cms up to tens of metres. A well-known example of these dykes is exposed in the old Želešice quarry. Remarkable spatial and textural relations were found here between the rhyolites and S-type granites in rare stocks which intruded hornblendite of the diorite belt. The rhyolites are calc-alkaline with clear affinity to a continental source (e.g., high K, Rb, strongly fractionated REE patterns and distinctly negative initial ε_{Nd} values - Ch. Pin, pers. comm.). The matrix is aphanitic, quartz and feldspars are common phenocrysts, biotite and amphibole are rare. Contamination of rhyolites is indicated by xenoliths of, and abundance of xenocrysts derived from, the mafic wall rocks.

There are no significant changes in chemical composition between rhyolites and granites. Variation diagrams point to a similar character of magmatic source as well as subsequent differentiation. Textural evolution from the hypautomorphic, equigranular granite to porphyritic rhyolite with sector zoning in feldspars and brecciated rocks indicates crystallisation of granitic magma during rapid pressure drop at high crustal levels.

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Comparison of Magnetometric and Geometric Methods of Strain Analysis of Culmian Conglomerates and Graywackes, Drahanská Vrchovina Upland

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The Drahanská vrchovina Upland in the easternmost part of the Rheno–Hercynian Zone is built up of the Lower Carboniferous flysch represented by conglomerates, graywackes, siltstones and shales. Pebbles from the polymict Luleč and Račice coglomerates (located in the SE part) and the Kořenec conglomerates (located in the westernmost part) were used as strain markers for the geometric strain analysis. Anisotropy of magnetic susceptibility (AMS) was measured on samples from the graywacke matrix of the conglomerates. The magnetometric and geometric methods of strain analysis were compared.