overrode the Raabs unit and the Drosendorf unit during the Variscan collision event (FRITZ & NEUBAUER, 1993), but is now widely eroded. The Gföhl nappe (THIELE, 1984), as hangingwall tectonic element of the Austrian Moldanubian unit, probably contains rests of this terrane, but it includes also oceanic material of the Raabs ocean. Petrographic and geochemical data (FINGER & STEYRER, 1994) suggest that the Gföhl nappe (in the sense of THIELE, 1984) is a voluminous tectonic melange of rocks of variable origin and metamorphic history, that were welded together in the subduction zone, where the Raabs ocean was consumed (the often used term "Gföhl terrane" is, therefore, a misleading term that should better be avoided).

Actually, the southeastern Bohemian Massif reveals a typical Variscan story in documenting Early Paleozoic rifting of Panafrican basement up to oceanization (break up of the northern Gondwana margin) and subsequent Devonian to Visean subduction and collision tectonics, as a result of the general convergence and final collision of the megacontinents Gondwana and Laurasia (cf. e.g. FRANKE 1989).

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GEOCHRONOLOGY AND EVOLUTION OF THE SOUTH BOHEMIAN MASSIF: A REVIEW

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Lithostratigraphy: The Monotonous Series in the Bayrischer Wald near Regensburg, Bavaria, represents a late Proterozoic (Vendian) graywacke sequence of which the hinterland was overprinted for the last time during the Cadomian orogenic cycle. Rb/Sr-whole rock data from the Monotonous Series E of the Weinsberg granite are well in line with this interpretation. The Monotonous Series is tectonically overlain by the much older Dobra orthogneiss, which readily could be dated as a 1.38 Ga old granodiorite which has seen a metamorphic overprint around 600 Ma. It represents the basement for the Variegated Series in Lower Austria. At least a major part of the Variegated Series S of the Kamp valley represents a Proterozoic sequence. Sr isotope ratios around 0.706 from pure marbles, typical for the Variegated Series,

are only compatible with depositional ages of 800 - 900 Ma or older. Such low Sr ratios have not been found in other occurrences of marbles from the Variegated Series. Also Silurian sporomorphs in marbles from Ceský Krumlov are reported. Therefore, two different age group of carbonates are incorporated in the Variegated Series. A series of metabasic rocks of variable geochemical signature form the next rock unit, partly closely associated with clastic rocks. At least some of them belong to a late Proterozoic age group. The small Weiterndorf granite gneiss exhibits relictic discordant contacts with such amphibolite bearing sequences and Rb/Sr and zircon data of this small body indicate an age of >600 Ma.

Ophiolite sequences from Rehberg and Raabs are now usually compared with the Letovice complex and are considered as remnants of the Paleozoic ocean between the Moldanubian terrain and the European Cadomian foreland. This may turn out to be true, but one should bear in mind that at present, except from a local mafic layer (zircon U/Pb: 358 ± 8 Ma) in the Drosendorf area, no conclusive ages from the main amphibolite bodies are known.

We consider the cluster of Rb/Sr whole rock data of 470 - 487 Ma from the Gföhl gneiss and the granitic portion of the granulite series to be good approximation of their protolith ages inspite of the strong Hercynian overprint of these rocks. Similar ages on granite gneisses have been found in the Sudetes. They coincide with the time span of the formation of intermediate to acid calcalcaline volcanics in the Barrandian during the Cambrian/Ordovician.

The Cadomian magmatism in the Bruno-Vistulian and Moravian units is well established. The lithological similarities between Dobra gneiss and Bites gneiss which includes Proterozoic carbonate rocks in close association with them is definitely a key point in the evolution of the two terrains but still not satisfactorily understood.

Variscan data: The oldest geochronological information about the Variscan high temperature and magmatic evolution are derived from zircons around 350 Ma from rocks related to the Weinsberg type granite and the Rastenberg granodiorite, which is well in line with former Rb/Sr whole rocks data of 349 ± 9 Ma from the same rock type. Several younger intrusions of similar lithology are known, the youngest showing U/Pb ages on monazite of 318 ± 4 Ma. In the Central Moldanubian pluton the magmatic activity was centered around 316 ± 7 Ma (Eisgarn granite) but continues until 303 Ma. The narrow time span of data relevant for the age of granulite facies metamorphism cluster around 340 - 338 Ma. This is interpreted as the end of this high temperature event.

Oldest mineral cooling ages (muscovite Ar/Ar: 343 ± 1.5 Ma) have been reported from pebbles in the Visean Moravo-Silesian fore deep. The time span 340 - 327 Ma is typical for the cooling from 500 °C to approximately 400 °C of both the Moldanubian nappe pile and the Moravian foot wall nappes. Locally biotite exhibits cooling ages of 315 Ma to 295 Ma. Mineral cooling ages of the plutonic rocks show no uniform regional trend. Muscovite Ar/Ar ages of 328 ± 1.5 Ma are found on late, cross cutting pegmatites and leucocratic granites (Pöchlarn). Several muscovites from the Eisgarn granite cluster around 326 ± 1.5 Ma. As these rocks yielded

a well defined Rb/Sr age of 316 ± 7 Ma, we assume a small but rather uniform ^{40}Ar excess in this intrusive rocks. Locally additional low temperature Ar excess steps are found. Also the Rastenberg granodiorite yielded older biotite cooling ages (Ar/Ar, K/Ar) than the surrounding country rocks. Varying cooling ages between 314 Ma and 293 Ma (Ar/Ar on muscovite and biotite) have been found in the Mühlviertel area reflecting the varying thermal distribution caused by several young granitic intrusives.

Orogenic evolution: An evolutionary model of the SE Bohemian Massif has to consider its syntaxial structure in the large scale continuation of the Variscan orogenic belt. The present day tectonic framework and its structural evolution is at the eastern margin is dominated by the transpressional contact with the Bruno-Vistulian indenter. Older evolutionary stages were lost or intensely reworked during this late orogenic stage. The Gföhl nappe characterised by its garnet peridotites, HT eclogites and HT/HP granulites is forming the uppermost tectonic unit surrounding the syntaxial structure in the N, NE, and E. The large age differences between the Dobra gneiss and the Monotonous Series clearly point to an important (early Variscan?) crustal shear zone between these two units. This tectonic contact was completely overprinted during the main (second) amphibolite facies metamorphism. The Gföhl nappe left its deep crustal level at about 340 - 338 Ma at a time when the large Weinsberg granite already was emplaced in a high crustal level and the Rastenberg granodiorite was still intruding. This situation and the metamorphic evolution at the Eastern contact of the Moldanubian which clearly points to an inverted crustal section, strongly indicate a later transpressional rotation of an older more linear trending deep crustal detachment zone comprising the Variegated Series and the Gföhl nappe. From the regional trend lines of the Variscan orogen we assume that the easterly continuation of the Saxothuringian zone was cut off by a large dextral transcurrent fault system in the earliest stage of the transpressional evolution. We postulate that an ocean existed between the Bruno-Vistulian/Moravian foreland and the propagating Variscan orogenic front. Remnants of this ocean may also have been offset by the supposed transcurrent fault zone.

Can we find any relics of these elements? In the Variscan part of the Penninic Tauern window we deal with a long term oceanic environment in which a near continental island arc developed in Devonian/L. Carboniferous times. Disregarding the Alpine structural overprint, Variscan volcanic/magmatic features together with L. Carboniferous (?) flyschoidal deposits are well preserved. Variscan granitoids of I-type affinity are widespread in the Zentral Gneis intrusives. Therefore the idea that the Variscan basement in the Tauern window represent an exotic crustal piece in the pre-Alpine crust squeezed off from the northern front of the Variscan orogen should be investigated.