Domažlice complex, was metamorphosed and deformed before the deposition of lower Cambrian sediments in the Barrandian basin. Even if this was as late as 530 Ma (cf. PATCHETT et al., 1980), and there is no unanimity about the early Cambrian time-scale, it pre-dates by at least 20 Ma the age of the Stráž segregation pegmatite determined from the Rb-Sr isotopic systems of the muscovite-plagioclase pairs. Also to be taken into account is the lack of expression in the Rb-Sr isotopic system of the biotite-plagioclase pair of the early Carboniferous tectono-thermal event(s) so prominently expressed in other parts of the Bohemian Massif (cf. AFTALION et al., 1989).

Generally coeval with the products of the mid-late Devonian reheating shown in the Stráž rocks are granitoid rocks, formed in an arc-type environment, and now seen as the Staré Sedlo and Mirotice gneisses in central Bohemia (U-Pb zircon data; KOŠLER et al., 1993), and eclogites in the eastern Bohemian Massif (Sm-Nd data; BRUECKNER et al., 1991) indicative of plate tectonic activity. Whether the 380 - 370 Ma K-Ar mineral ages for the northwestern part of the Massif (KREUZER et al., 1989) represent corresponding activity and what relationship generally coeval events in the Polish segment bear to the events in the main part of the Massif are matters requiring further investigation. The same is the case for the significance in the development of the Bohemian Massif of the new Rb-Sr data presented here. With a multi-episodic history that reflects the operation of polymetamorphism, polyphase deformation including many phases of thrusting, and multiple igneous injection, not only is much more isotopic data needed, but data that can be linked, without ambiguity, to geological events.

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THE PRE-ALPINE CRUST IN THE ROMANIAN CARPATHIANS

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Reconstructions of the Alpine sedimentation domains by retrotranslation of nappe transport suggest that the Variscan basement included in the Alpine tectonic units

of the Carpathians represents a part of the southern continuation of the Mid-European Variscan structures, disintegrated in the following three main terranes by NNE-SSW oriented Triassic and Jurassic rifting and spreading systems.

1. **Danubian Terrane:** The pre-Alpine basement consists of Variscan low grade metamorphics on O-C_1 sedimentary and volcanic educts (Drencova-Piriul Rece, Dr; Brustur, Bt; Valea Izvorului, Vlz) covering a composite Precambrian basement. Both, cover and basement are imbricated by Variscan napping. The Precambrian metamorphics, represented mainly by MT/MP amphibolitic (Ielova, Ie; Dragsani, Dg; Maru-Zeicani, MZ), gneiss amphibolitic (Neamtu, Nt) and MT/LP gneissic (Lainici-Paius, LP) associations, were intruded by Variscan (Siehevita, Si), Caledonian (Sfirdinu-Cherbelezu, SCh, 370 - 400 Ma) and Cadomian (Susita, Su, 610 Ma, Tismana, Ts, 590 Ma) granitoids. At the end of the Proterozoic this Precambrian continental crust split and a late Precambrian or early Cambrian oceanic crust (Tisovita Terrane, Ts) was interposed. In the Cambrian magmatic arc deposits formed on this oceanic crust (Berkovica-Corbu, Bk, HAYDOUTOV, 1987), related to a first, Cambrian, subduction. In the Caledonian event this arc deposits were subjected to a LT/MP metamorphism, the oceanic crust was obducted eastward under greenschist metamorphism conditions (Corbu shear zone, Plavisevita metagabbro) and then pierced by Caledonian granitoids, probably related to a new subduction zone. The mentioned structures were transgressively covered by O-S and D-C_1 sediments. This Paleozoic cover and its pre-Variscan basement were involved in Variscan low grade metamorphism and subsequently in a tectonic shortening by napping. The non-metamorphic overstep sequence started with the Westfalian C.

2. **Bucovino-Getic Terrane:** The pre-Alpine basement consists of a pile of Variscan nappes, involving both Variscan metamorphics on Paleozoic sedimentary and volcanic educts and Precambrian and early Caledonian crustal fragments. Two main zones of S-C_1 low grade metamorphic sequences were recoginized: Poiana Rusca (PR) -LT/MP- in lower tectonic position in the pile of nappes, and Rodna (Ro) -LT/LP- in highest tectonic position. These zones are separated by Caledonian LT/MP metamorphites on arc related Cambrian bimodal volcanics (rhyolite/basalt) and sediments (Tulghes, Tg) and by Precambrian MT/MP $\pm$ LP polymetamorphic sequences (Carpian, Cp; Sebes-Lotru, SL). In the Precambrian crustal fragments large shear zones, originating from the lower crust, may be recognized (Sebes-Lotru, Leaota-Iezer). They were activ in MT/MP conditions and produced long distance tectonic transport of exotic (anisofacial) fragments from the lower crust and upper mantle (garnet-peridotites, eclogites granulites).

3. **Apuseni Terrane:** Probably an accretionary prism on the European margin. Below Permian sediments a pre-Variscan composite basement and a Paleozoic low grade metamorphic cover (Paiuseni) may be distinguished. In the eastern part Caledonian (Biharia-Muncel) and Precambrian (Baia de Aries) crustal fragments show resemblances with the Bucovino-Getic Terrane.

The synmetamorphic structures in the Carpathians, their lithology, lithostratigraphic sequences, tectonic nappe empilement and arrangement in two main thrust belts,

separated by imbricated pre-Variscan units, show evident resemblance with the Variscan crust of Middle Europe. The dominant south-west vergengency in the Carpathians suggests that prior to the Mesozoic compression a south-vergent Variscan framework existed south of the actual northern Alpine front, partially with a sequence of the main units (Carpian + Sebes-Lotru, Rodna, Carpian, Poiana Rusca), quite similar as in the north (Moldanubian, Saxo- Thuringian, Middle German Rise, Rheno-Hercynian). It seems that the Moravo Silesian and Schwarzwald-Vogese zones belonged to this southern ensemble in that the Variscan regional metamorphism was more intensive as in the north.

CONTRASTING METAMORPHIC PATHS IN THE EASTERN PART OF THE KARKONOSZE-IZERA BLOCK, NE BOHEMIAN MASSIF

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The eastern margin of the Karkonosze-Izera Block is a longitudinally aligned metamorphic belt, between the Variscan Karkonosze pluton in the west and the Carboniferous-Permian Intrasudetic Basin in the east (Fig. 1). Four tectonolithostratigraphic units can be defined there (MAZUR, 1993; KRYZA & MAZUR, 1994); from west to east, and structurally upwards, these are: (a) Kowary gneiss group, composed of orthogneisses yielding a 500 Ma U-Pb age (OLIVER et al., 1993) and minor mica schists; (b) Czamiów schist formation, comprising variegated metasedimentary and metavolcanic rocks of assumed Late Precambrian Early Paleozoic age (CHALOUPSKY, 1989; TEISSEYRE, 1973); (c) Niedamirów schist formation of phyllites and basic metavolcanogenic rocks (?Late Precambrian - Early Paleozoic and/or ? Ordovician-Silurian; (CHALOUPSKY, 1989; TEISSEYRE, 1973), and (d) Leszczyniec meta-igneous complex formed of metabasites dated at ca. 490 Ma (OLIVER et al., 1993) and of orthogneisses. These major subdivisions are tectonically bounded, and most boundaries represent ductile shear zones related to E-W extension (MAZUR, 1993).

Evidence of HP metamorphism in the area was reported in several papers (e.g. WIESER, 1978; CHAB & VRANA, 1979; GUIRAUD & BURG, 1984) but new systematic studies of PT paths are still needed. 17 specimens have been analyzed using CAMEBAX microprobe. Particular tectonostratigraphic units are found to have experienced different PT paths. The Kowary and Czarnów units bear the evidence of medium pressure low grade metamorphism (apparently below the amphibolite facies) overprinted by a later high-temperature event. This metamorphic path is recorded by inverted zonation in plagioclase, Si content in white mica (Fig. 2a) decreasing from 3.3 in core to 3.1 in rim, and Alm-richer garnet rims. The higher units of Niedamirów and Leszczyniec, both represent higher-pressure metamorphic series.