relationships of these Moldanubian events with the Cadomian calc-alkaline batholiths (Thaya, Brno batholiths) within the Moravian units.

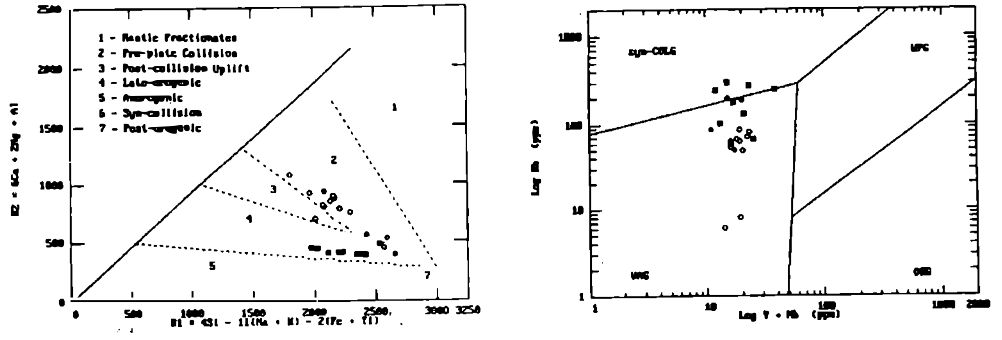

Fig. 2: Variation diagrams of Moldanubian orthogneisses showing evolution trends of Moldanubian orthogneisses:
Left side: Major elements factorization diagram after BATCHELOR & BOWDEN (1985).
Rigth side: Trace element diagram after PEARCE et al. (1984). Both diagrams basically display the pre-plate collisional (Dobra/Spitz gneisses) vs. the syn-collisional to late orogenic trend of the Weiterndorf gneiss. Legend: Circles: Spitz gneiss; filled squares: Weiterndorf gneiss; filled circles: melanocratic Dobra gneiss.

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STRUCTURE AND KINEMATICS OF MOLDANUBIAN UNITS WITHIN THE SOUTH-EASTERN BOHEMIAN MASSIF: EVIDENCE FOR THE EMPLACEMENT OF DEEP-CRUSTAL NAPPES

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The Moldanubian units of the southeastern Bohemian Massif include a pile of Variscan nappes which formed within high- and medium-grade metamorphic conditions. An evaluation of presently used definitions, the strict application of a balancable stratigraphy and new field evidence argue for a new distinction of major tectonic units and tectonostratigraphy, respectively. From hangingwall to the footwall the section includes: (1) the Dunkelstein-St. Leonhard-Blumau nappe with granulite and granet peridotite forming klippens; (2) the Rosenburg nappe with partly migmatitic micaschists; (3) the Gföhl nappe with the Gföhl gneiss s. str. and ultramafic bodies. The units (1) to (3) are interpreted to form the upper plate. The lower plate includes (4) the Raabs nappe which is likely related to the Rehberg-Buschandelwand zone, all including much amphibolite of uncertain, in part likely of ophiolitic origin; (5) the Bunte Serie with predominantly supracrustal rocks; and, finally, (6) the Montonous Serie with migmatitic paragneiss. Monotonous and Bunte Series are affected by the intrusions of the Weinsberg/Rastenberg plutons.

An apparent inverted metamorphic section with the Gföhl granulite nappe at the top and the Bunte Serie and Monotonous Serie with higher amphibolite facies conditions at the base of Moldanubian units together with tectonically emplaced mantle rocks at the base of the Gföhl nappe s.str. indicate the presence of a plate boundary at the base of the Gföhl nappe. The general structure of the Moldanubian units is that of forward dipping upper-plate duplex which lies on the eastern front of a likewise forward dipping upper margin of a lower plate flake, the latter represented by the Montonous Serie.

Detailed structural and microfabric studies reveal that high-grade metamorphism is synkinematic with pervasive ductile deformation through the entire nappe pile. Although noncoaxial fabrics with shear sense indicators top to the NNE along NNE-trending mineral lineations (D1) are often observed in outcrop-scale structures crystallographically preferred quartz and calcite c-axis patterns are completely annealed in lower portions of the section, or display coaxial fabrics formed during a later extensional stage within the Gföhl gneiss and granulites. Basically, top to the NNE shear is interpreted to have resulted in the formation of the nappe pile. The western portion of the section is largely modified by a succession of at least three large-scale folding phases (D2 - D4) which formed synchronously with final emplacement of the Moldanubian nappe pile on the Moravian units. The D4 folds with S-trending large-scale domes and open synforms are associated with the dextral, NE-trending ductile shear zone along the southern margin of the Ostrong dome which exposes the Monotonous Serie. These D4 structures are interpreted to have resulted from E-W shortening by blocking of shortening on a steep NNE-trending dextral stretching fault within the Moravian foreland. Dome formation argues for blind (ductile?) thrust faults at the depth.

General relationships to the NNE-trending Moldanubian front with the Moravian units as well as fold vergence during D1 and D3 indicate nappe stacking and crustal shortening along a dextrally transpressive margin.

The Weinsberg granite intruded within similar strain conditions. A flat-lying magmatic foliation and a generally NNE-trending magmatic lineation (D5) is preserved within eastern portions of the granite. In the Moldanubian units to the east of the pluton a relatively regular pattern of radial granite dykes has been observed which resulted from similar stress conditions. The western portion of the

Weinsberg pluton is overprinted by a solid-state deformation which formed synchronously with NW-SE extensional structures (D6) to the east of the pluton. These low angle normal faults largely affected the former thrust contacts. Another set of localized flat-lying semiductile shear zones (D7) with general top to the N displacement within southern Moldanubian units transsects granitic dykes. It is most likely independent from D6 and is interpreted to result from N-S stretching of the Moldanubian nappe pile, or is associated with final top to the NNE displacement along the Moldanubian front.

Sinistral shear along NE-trending fault zones like the Vitis and Diendorf fault zones (D8) are of late Carboniferous and Early Permian age because of the formation of step-over and transcurrent basins along the Diendorf fault. The NNE-trending unmetamorphic lamprophyric dykes which transsect Moldanubian units likely synchronously intruded within similar stress conditions.

General geometrical relationships of Moldanubian units to footwall tectonic units within the Bohemian Massif argue for a continental indenter within the present Alpine realm as the driving force which was responsible for the formation of transpressive structures as expressed from D1 to D8 within the southeastern Bohemian Massif. Available geochronological data of metamorphism and associated deformation as well as the formation of short-living, Visean foreland basin indicate (1) that continent-continent collision did not occur before Visean, and that this process was a relatively short process. This indenter resulted in NNE-directed nappe stacking of continental margin sequences and final emplacement of these nappes onto the Moravian foreland on which a transpressive foreland formed.

SYN- AND POST-OROGENIC LAMPROPHYRE DYKE SYSTEMS IN THE SOUTHEASTERN BOHEMIAN MASSIF

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The southeastern Bohemian Massif is transsected by two generations of lamprophyric dykes. Dykes from the first generation include internally foliated and metamorphic dykes which trend ESE. This generation is interpreted to result from synorogenic emplacement of thrust sheets during final WNW-ESE shortening of the Variscan nappe complex. The majority of second generation dykes with unfoliated and unmetamorphic dykes follows a major NNE-trending zone ("Waldviertel dykes"). Emplacement of these dykes postdates Variscan deformation of the Bohemian Massif and is related to ongoing extension in the Alpine-Carpathian belt because of