The Niedamirów unit displays records of higher P and lower T (glaucophane, Sps-rich garnet, and albite) than the uppermost Leszczyniec complex. In both, the early P-dominated metamorphic events are followed by moderate-pressure metamorphism (Si content in white mica decreasing from 3.5 in core to 3.3 in rim). The Karkonosze-Izera block seems to represent a typical example of Variscan core complexes. The metamorphic core (Kowary and Czarnów units) is characterised by MP/MT metamorphism followed by a HT/LP event (Fig. 2b). The core is tectonically overlain by the Niedamirów and Leszczyniec units, which form the "upper plate". The units display inverted metamorphic zonation characteristic of a nappe pile. At a late stage, it underwent uplift and normal faulting related to the Karkonosze granite intrusion in the west, and the subsidence of the Intra-Sudetic basin in the east.

MAZUR, S. (1993): Unpublished PhD. Thesis, Wroclaw University.
KRYZA, R., MAZUR, S. (1994): in prep.
OLIVER, G.J.H. et al. (1993): J. Geol. Soc. London, 150.
CHALOUPSKY, J. (Ed.) (1989): Ustr. ust. geol., Praha.
TEISSEYRE, J.H. (1973): Geol. Sudetica, 8, Warszawa.
WIESER, T. (1978): Mineralogia Polonica, 9, Krakdw.
CHAB, J., VRANA, S. (1979): Vestnik Ustr. Ust. geol., 54/3, Praha.
GUIRAUD, M., BURG, J.P. (1984): N. Jb. Miner. Abh., 149.

GRANITOIDS FROM THE SOUTHERN PART OF THE BRNO MASSIF (BRUNOVISTULICUM)

LEICHMANN, J. & HÖCK, V.

Institut für Geologie und Paläontologie, Universität Salzburg

Based on detailed field work, petrology and geochemistry seven granitoid groups can be distinguished and mapped in the southern part of the Brno massif (Fig. 1), apart from more basic magmatic rocks such as diorites and basalts. There are

1. Leucogranites (G1)
2. Fine-grained garnet bearing granites (G2)
3. Biotite granite to granodiorites (G3)
4. Biotite granodiorites (G4)
5. Hornblende biotite granodiorites (G5)
6. Hybrid granitoids (G6)
7. Trondhjemites (G7)

The Leucogranits (G1) together with fine grained garnet bearing granites (G2), biotite granites to granodiorites (G3) and hornblende biotite granodiorites (G5) show clearly a **calc-alkaline trend**. In contrast the trondhjemites (G7) belong in the K-Ca-

Na triangle according to BAKER (1979) to a **trondhjemitic** trend. The biotite granodiorites have a transitional position between this two trends (Fig. 2). The hybrid granitoids (G6) are interpreted as a possible mixture between granite and diorite, their exact classification is difficult. Calc-alkaline and Trondhjemitic types show basic differences in their geological position, petrology, geochemistry, and zircon typology.

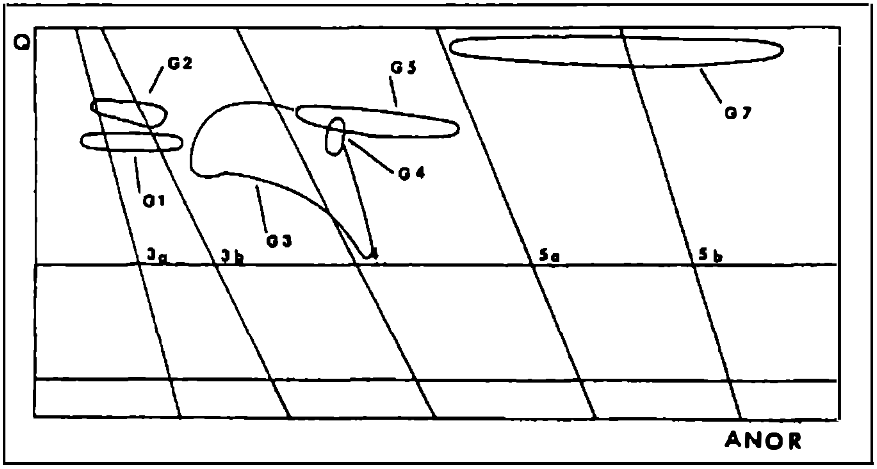

Fig. 1: Q-ANOR diagram (STRECKEISEN & Le MAITRE, 1979), the numbers correspond with group numbers in text.

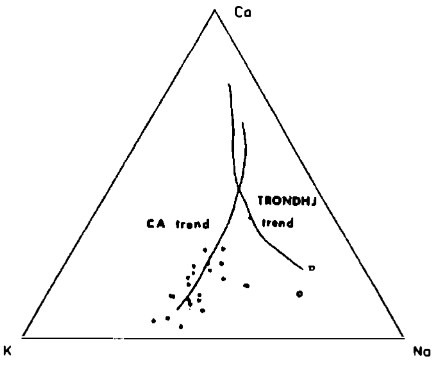

Fig. 2: CaNaK triagle, CA and Trondhjemitic trends according BAKER (1979).

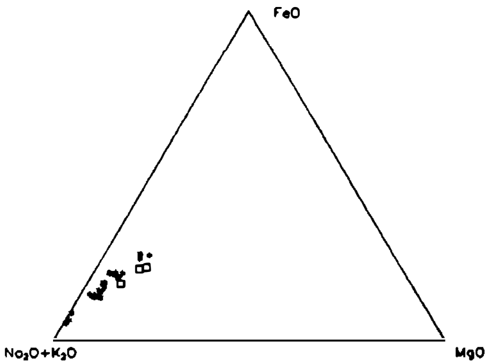

Fig. 3: AFM triangle, stars for calc-alkaline group, squares for trondhjemitic group. Two different trends are visible.

Calc-alkaline granitoids are characterized by granitic to granodioritic composition (Fig. 3) with biotite or with chlorite after biotite and rare hornblende. The relation Na_2O/K_2O fluctuates around 1 or is <1. The zircon typology parameters after PUPIN (1980) correspond to alkali rich granitoids with I-type characteristic.

The second - trondhjemitic - type has a tonalitic composition (Fig. 3) with potassium feldspar content <1%. The medium composition is quartz - 34%, plagioclase (albite) - 57, chlorite (after pyroxene, hornblende?) - 6%, white mica (secondary) - 1%, or and secondary minerals - 2%. The low mafic mineral content and the predominace of albite are typical signs for trondhjemite. The relation Na_2O/K_2O is >4,5. Zircon typology data with predominance of prism (110) and pyramid (211) show aluminum enrichment in this rocks and correspond very well with chemical parameters. In the mesonorm classification (MIELKE & WINKLER, 1979) 4 - 5 % content of normative corundum is typical for trondhjemites.

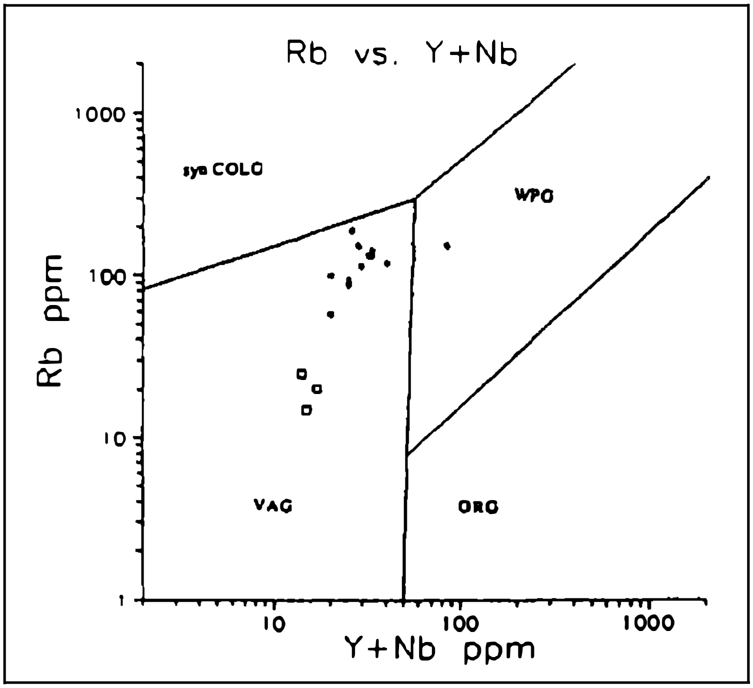

Fig. 4: Rb/Y+Nb diagram (PEARCE et al., 1984). VAG = island arc granitoids, ORG = ocean ridge granites, WPG = within plate granitoids, syn COLG = collision zone granitoids.

Low grade metamorphic overprinting and hydrothermal alteration are two very important processes changing the original mineralogy and geochemistry of the most granitoids rocks. The sericitization of oligoclase is widespread. Andesine from the hornblende biotite granodiorite (G5) is partial replaced by epidote and albite from trondhjemites by kaolinite. Biotite and partly hornblende from the calc-alkaline type granitoids are often partly or completely replaced by chlorite. Nevertheless the original minerals can be recognized, except for G7, the trondhjemitic group. Here the relict minerals are mostly missing. The youngest alteration process is the microclinization. Newly formed potassium feldspar encloses altered plagioclase and biotite. The microclinization, unlike sericitization and chloritization is not regional, it affected only leucogranites and restricted zones in the biotite granites (G3).

According to PEARCE et al. (1984) all granitoids, with one exception of the biotite and garnet bearing granite, plot in the Nb/Y and Rb/Y+Nb diagram in the field of volcanic arc granitoid (Fig. 4). The same situation has been shown by JELINEK & DUDEK (1993) for the subsurface part of Brno pluton and by FINGER et al. (1989) for the Dyje massif.

METAMORPHISM AND MIGMATIZATION OF THE PARAGNEISSES OF THE MONOTONOUS GROUP, SE MOLDANUBICUM

LINNER, M.

Institute of Petrology, University of Vienna, Dr. Karl Luegerring 1, A-1010 Austria

In this study rocks of the southern part of the Monotonous Group (Ostrong area) were investigated. Paragneisses form the main part of the Monotonous Group. They are accompanied by leucocratic sillimanite-bearing orthogneisses, subordinate calc-silicate-gneisses, and sporadic eclogite-amphibolites. Two types of paragneisses can be distinguished: cordierite-gneisses, which are characteristic gneisses for the Monotonous Group, and cordierite-free paragneisses. A typical feature of the cordierite-gneisses is the migmatization to stromatic- or nebulitic cordierite-migmatites. The geochemistry of the paragneisses indicates shales respectively greywackes as educt material for cordierite-bearing and cordierite-free paragneisses. The environment of deposition is probably an active continental margin.

Three stages of metamorphism are recorded in the paragneisses:

- The early stage is preserved as kyanite relics in cordierite-gneisses and kyanite/staurolite relics in garnet-paragneiss. The conditions, 570 °C and 6 kbar (P_{min}), are estimated from the latter rock.
- The peak of temperature was determined in cordierite-gneisses and one garnet-bearing paragneiss as around 700 °C at P_{min} 4.5 kbar. Dehydration melting (THOMPSON, 1982) took place in this stage and initiated the migmatization of the cordierite-gneisses.
- Neoblasts of white mica crystallized during the retrogressive stage mainly in the cordierite-migmatites.