Study of the Foraminifera from a sample of the locality Glanriedl (near Salzburg, Austria)

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Abstract

A sample (out of Gosau beds) of the locality Glanriedl has been studied. The investigation revealed 55 species out of which 18 could not he determined specifically due to poor preservation. The families Nodosariidae, Rotaliidae and Globotruncanidae are very well represented.

The fauna shows a close resemblance to the fauna collected and described by A. E. REUSS 1854 and by K. KÜPPER 1956 from Basin of Gosau; and to that described by A. TOLLMANN 1960, of the Weissenbach-Valley in Styria.

For age determination, the following species were considered as guide forms; *Globotruncana concavata concavata* (BROTZEN), *Globotruncana ventricosa primitiva* DALBIEZ, *Stensiöina exsculpta gracilis* BROTZEN and *Neoflabellina cf. deltoidea* (WEDEKIND). The age of the material was considered to be Coniacian.

Contribution to the geology of the Semmering Window between Kirchberg and Molz Valley (Lower Austria)

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Abstract

The region studied (about 30 sq.km.) is located at about 80 km SW of Vienna and 10 km S of Gloggnitz, in Lower Austria. Geologically it belongs to the Semmering (Wechsel) Window, where Lower Eastalpine elements outcrop.

Rock-Types Involved: Two major outcropping units had been mapped in regard tectonic features. The Wechsel Unit extends from the Molz Valley towards the Kreuzbauern-Wilhelmshof Fault, where it ends abruptly. It comprises a low-grade metamorphic schist (quartz-albite-muscovite-chlorite schist), belonging to the Green Schist Facies (quartz-albite-muscovite-chlorite sub-facies), containing epidote, ankerite and graphite as minor constituents, and relicts of detritical albite-oligoclase, also known from the phyllites of Trattenbach (Murty, K.S. — personal communication). The main microscopic characteristic feature are albite porphyroblasts crowded with *si*-inclusions (quartz, muscovite, chlorite and graphite) from the *se*-matrix. The authors disregard old terminologies given to it (albite gneiss, Wechsel gneiss, etc.) hecause the rock does not fulfil the structural (fabric) requirements of such names, and prefer to agree with MOHR'S (1911) denomination, Wechsel Schist. Near the stronger tectonic zones the rock becomes a real medium-grained blastophyllonite.

Grob Gneiss Unit comprises a group of phyllitic mica schist intruded by a post-orogenic (?), massive granite of variscian age, itself named Grob Gneiss, by the fact that its mineral assemblage had been altered by the alpine epi-metamorphism It outcrops from the upthrust block of the Kreuzbauern-Wilhelmshof Fault towards Kirchgraben, in the NE part of the region. Perthitic microcline, "filled" oligoclase (clinozoisite and sericite microliths), "unfilled" twinned albite, quartz, and partially chloritized brown biotite are the main minerals. Epidote,

albite and chlorite are prodncts of metamorphic alteration. The granite country-rock, formerly a phyllitic mica schist, had heen converted into an "augen-migmatite" (Kreuzhauern) hy growth of K-feldspar porphyrohlasts along the original s-planes due to the influence of granitic fluids. In a quarry near St. Wolfgang, we have found inclusions from the country rock showing hornfelsic texture, with some K-feldspar porphyrohlasts; the original s-planes remaining undestroyed.

The northern part of the region is covered by calcareous rocks (sligthly metamorphosed limestone) supposed to helong to the Semmering Mesozoic.

Tectonic Features: The Wechsel Schist strickes NNW-SSE, dipping towards W, displaying two different trends of linear structures, which are regarded to be of different deformation-times. The older axis is represented by mesofolding axis B, quartz trains boudins-like (lying in the "ab" plane), quartz-rods, and intersections of two sets of s-planes (schistosities), trending nearly N-S and plunging towards S. Geometric and kinematic analyses of folds trending N-S, have shown them to be plane cylindrical folds, with an assymmetric chevron style. E-W fold axis defines a further deformation-time, although not so common as the former, are ever present. The style is quite different from the N-S folds. The E-W ones had been produced by slip-folding along discrete S_x-strain-slip cleavage, parallel to the axial planes of the folds. These S_x-planes dislocate the passive older schistosity, and the development of microlithons can be seen. The whole fabrixc is triclinic due to superimposed deformations. Rotated albite porphyrohlasts (post-crystalline rotation), according to the E-W axis, which can be seen easily in sections parallel to N-S axis, support the mesoscopic imprint of a latter deformation. Such E-W folds were also recorded on the Weinweg (Murty, K. S. — personal communication).

The Grob Gneiss Unit is thrust from N towards S, and two major upthrust faults had been defined. One of these had thrust the unit against the Wechsel schist, in a tectonic contact - it is the Kreuzbauern-Wilhelmshof upthrust —, while the other was responsible for the upthrust of the meta-granite over the mesozoic limestone, near St. Wolfgang. E-W linear structures, displayed by orientation of K-feldspar porphyroblasts, are widespread in the "augen-migmatite", these porphyroblasts show a post-crystalline rotation around the E-W axis. Striae trending N-S and plunging N (*a* lineations) occur in all the slickenside planes. Petrofabric diagrams of [0001] quartz axes ("augen-migmatite" and flaser granite) show a N-S girdle normal to both "ab" plane and "b" axis of the fabric. Cross "ac" joints coinciding with the quartz girdle support inferences that the σ_1 axis of the stress system lies somewhere in the girdle plane. The whole fabric is homotactic and monoclinic. Petrofahric diagrams from slickensides (near Kirchgraben), where the granite was flasered by the deformation related to the upthrusts, show an axial maximum for [0001] quartz axes, parallel to "a" axis of the fabric, plunging towards NE, in accordance with the supposed sense of movement. N-S, "ac" joints (tension) are widespread over the region, associated with shear joints.

From the above considerations we propose the existence of two axes of deformation. The former showing a N-S trend related in time to the metamorphism of the Wechsel schist, and missing in the meta-granite. The latter, the E-W axis, is clearly related be upthrusts, and very probahly related to alpine deformation.

A new analysis of the Wechsel schist gave the following parameters, in regard ACF and A'KF Eskola's diagrams: A = 48.25%, C = 4.20% and F = 47.55% and A' = 45.39%, K = 7.09% and F = 48.52%, defining the original rock as a sedimentary one, which had a relatively high content of feldspar as indicated by the presence of detritical albite-oligoclase in all the sections examined.

Development of hoth albite porphyrohlasts and quartz trains and quartz laminae, on a regional scale is unrelated to a magmatic source; nor the latter can he mistaken for hedding

inherited from the parent rock, because relict bedding is missing over the region. The growth of albite porphyrohlasts is considered to he the result of local migration of sodium, derived intraformationally from the detritical albite, by metamorphic differentiation. The relatively high solubility of quartz and albite in low-grade environments is an essential factor that has facilitated segregation of quartz in lenses and laminae, and albite further redeposited and reaching the present porphyroblastic shape probably due to concretionary growth. The metamorphic differentiation and the whole metamorphic evolution is related to the first deformation-time.

Thus, the evolution of Wechsel schist from the original feldspathic sediment towards its present state has occured in the first deformation-time (N-S axis), and both direct and indirect components had played an important role in such evolution. Lineations parallel to B, intersecting s-planes, and girdle patterns in quartz diagrams point against crystallization under load.

Studies on the Wechsel and Semmering Rocks around Trattenbach

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Abstract

On the basis of the presence or absence, and the percentage of albite, tbe albite schists of Wechsel series in the Trattenbach area, are distinguished. The porphyroblastic nature is noted to he conspicuous towards the east, with reduced percentage of quartz. Albite grains in the greenschists are seen to display rotation to a more marked degree than the albite schists. Both the greenschists and the albite-rich albite schists are characterised hy prochlorite(?) variety of chlorite, while the albite-poor and albite-free schists are distinguished by the presence of Penninite. Chlorite in the Quartz-phyllites also shows Penninite.

Structural analysis of the rocks has not given any significant result, mainly due to inadequate measurements, which is again due to rarity of insitu outcrops of albite schists. However, the structural feature of the albite schist area is probably a dome.

Trace element studies show good correlation between the greenschists and albits schists. They fall in the same field, though the greenschists show inclination towards the basic field, and the albite schists move towards the clastic line. The greenschists are considered as products of low grade progressive metamorphism of tuffitic sediments, while the albite schists are products of low grade regional metamorphism of pelitic sediments. They belong to the quartz-albite-muscovite-chlorite subfacies of the greenschists facies. Phyllites and graphitic phyllites, in spite of divergence in some diagrams, on the whole show good correlation, and tbey are considered as products of metamorphism of sediments under reducing conditions, as evidenced by graphite and pyrite. The original rocks may be of graywacke composition.

The presence of felspar and muscovite in the quartzites from Baumgarten distinguishes them from the conglomeratic quartzites of the Semmering series. The interlocking nature of the grains in the former also is characteristic.

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