

## **Preliminary Geology of the Area Northeast of Bernstein, Austria**

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Metamorphic rocks of para and ortho origin, Tertiary detritals and alluvium were mapped in the area under study. Rock units are the High Crystalline Rock Series, Grobgneis Series, Rednitzer Series, Conglomerate Series and Alluvium.

High Crystalline Rock Series consist of different gneisses (para and ortho), amphibolite, eclogites, marble, schist, serpentinite, pyroxenite, quartzite and minor pegmatite granite.

Grobgneis Series consist mainly of augen gneisses with „septe“ of few gneissic schists, garnet mica schist, muscovite schist, quartzitic schist and biotite amphibolite. The gneisses of this series are also of ortho origin and could be similar to the ortho gneiss of the High Crystalline Rock Series.

Rednitzer Serie consist of different phyllites, greenschists, serpentinite, few marbled limestone and small gabbro intrusives.

Tertiary detritals und alluvium cover these metamorphic series.

Tectonic forces affected the area giving rise to two different types of metamorphism. From this point of view, the rocks are divided into several facies.

Two phases of tectonics which have affected the area have been recognized: (a). Pre-Alpine tectonics which gave rise to the amphibolite facies of metamorphism in the High Crystalline Rock Series. Here deformation and crystallization are simultaneous; (b). Alpine orogeny — which affected the High Crystalline Rock Series and the Rednitzer Series. The High Crystalline Rock Series could have been the basement of the Rednitzer Series and this orogeny could have uplift the series. Uplift gave rise to a „dome structure“ Folding and faulting followed. Mylonitization and sericitization was observed in the High Crystalline Rock Series. Grobgneis and other ortho-gneis derived from pre-Alpine, possibly Hercynian, intrusions and which were subsequently affected by metamorphism. Whether the granite was of anatectic or purely magmatic origin is still a problem.

In the Rednitzer Serie the metamorphism is of the greenschist facies.

The origin of the serpentinite in the Rednitzer Series can be related to the gabbro. The origin of the serpentinite and other basic rocks in the High Crystalline Rock Series seem to be different from the above mentioned serpentinite.

Methods of petrofabric analyses were used of orientation diagramms are preliminary and mainly descriptive since the area, where the samples were taken, is tectonically complex.

## **Petrographical and Mineralogical Notes on Rocks from the Area between Hochneukirchen and Bad Schönau**

By ALFRED BALIAN

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Low metamorphic rocks consist of coarse grained gneiss and schists. High metamorphic rocks are a series of coarse grained gneiss, quartzite (banded) and basic rocks with 30—50% Anorthite content. Conglomerate of the area consists of big boulders of gneiss rarely they are forming structures. Poor in binding material.

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### Special Laboratory Work on Chlorite

In order to determine the chlorite of schists of the area from all schist specimens thin sections were prepared and studied. Four samples were selected according to their chlorite content. They are from west around Mültern to east around Habich. Generally they are poor in chlorite content. The chlorites show anomalous interference colour, their medium grain size varies between 0,05—0,09 millimeter. Refractive index is 1,59—1,60 =  $n_y$ , optic sign. pos.

To obtain more information for determination of chlorite their powder patterns were prepared. X-ray spectography showed that the peaks were corresponding with powder patterns of 14 Å chlorite specimen examined by SHIROZU but the intensities except for 001 vary. The variations are in the intensities of 0kl peaks which are characterised by the b axis and according to SHIROZU is effected by Fe content of chlorite.

Overall with reference to the diagram of chlorite group by TRÖGER it is a chlorite between Mg-Prochlorite and Klinochlorite.

For further and more detailed determination the X-ray photography of samples should be prepared in order to obtain 0k0 (060) for calculating b which will reveal Fe content of chlorite.

### **Zircons of some Gneisses from the Area north east Bernstein**

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According to zircon analyses for gneisses from the area north east Bernstein, the following conclusions may be drawn. The assumption of sedimentary origin of some grobgnéis and granitic gneisses, are confirmed by the large amount of rounded and subhedral zircons found in these types of gneisses.

The zircons of different metasediments are not similar, so possibly the original sediment was not of one type. The fine grains of zircon in para-Grobgnéis together with other habits indicate, that the sediment from which the para-Grohgnéis was derived probably was more sandy.

The orthogneisses are confirmed by the large amount of euhedral zircons found in these type of gneisses.

Zircon habits of different orthogneisses indicate that, the original acidic igneous rocks probably were not of one type. Zircon of ortho-igneous gneisses is smaller than that of ortho-gneiss.

It is found that there are two types of ortho-Grobgnéis. The first contains self nucleated zircons and the second contains zircons nucleated on other minerals.

In general the metamorphic conditions necessary to the forming of the growth was not reached or only were for a short time. There was very few effect of alkaline solution before or after the metamorphism. Due to growthratio we can say that the ortho-igneous gneiss probably is of lower metamorphic grade than the ortho-Grobgnéis.