

Metasomatic and granitization-in-place theories, or any other theory that admit evolution of the "Rastenberg" mass without a magmatic point of view, do not account for the sharp contact of the western zone nor the transition between the oriented structures along the contacts and the massive core. Therefore, they are not regarded as satisfactory hypotheses.

### **Petrology and Structure of the Spitzer Gneiss from Dobra Area in the Bohemian Massif of Austria**

by G. G. DESHPANDE <sup>1)</sup> and ISHIK ÖZPEKER <sup>2)</sup>

#### **Abstract:**

The Spitzer Gneiss forms a major unit of the Moldanubian Zone and occurs between the Rastenger Granite to the West and the variegated series to the East, into which it gradually merges. The different types comprising the gneiss show a more or less uniform mineralogical composition with quartz 33.3%, alkali feldspar 10%, andesine 51%, biotite and accessories 5.7%. Bands of biotite rich amphibolite varying in thickness are found intercalated in the gneiss. These show plastic flowage due to squeezing and penetrate into the gneiss through fractures, sometimes in ramifying fashion. Some occurrences of dolomitic marbles and biotite muscovite gneiss containing sillimanite are also recorded. Several dykes of granite, aplite and amphibolite are found traversing these rocks.

The rocks show almost N—S-strike with steep dips and are intricately folded. They show well developed lineation. An attempt to interpret the structure of the gneiss has been made with the help of field data regarding the structural elements and petrofabric analysis.

With a view to inquire into the origin of the gneiss statistical study of zircons and spectrochemical analysis of the gneiss and amphibolite has been undertaken. The zircons show uniform elongation ratio, outgrowths and overgrowths.

Spectrochemical analysis of the typical Spitzer Gneiss and elongation ratio of zircons indicate 'Ortho' origin whereas the intercalated amphibolite is found to be of mixed-'Ortho-para'-origin. The analysis confirms 'Ortho'-origin of the amphibolite occurring in the form of dykes.

On the basis of the field evidence and data collected in the laboratory various views regarding the genesis of these rocks are critically discussed. The authors feel that the gneiss was formed by the metamorphism of 'Ortho' material and intercalated amphibolite from the basic tuffs.

### **Geology of Krumau Area**

by A. HOOSHMAND <sup>1)</sup>, F. AL-KUFAISHI <sup>2)</sup> and M. KHAFFAGY <sup>3)</sup>

#### **Abstract:**

The present paper records the results of the investigation of the Para-rock series "Paragesteinserie" outcropping around Krumau along the Kamp Valley in the Waldviertel (Niederösterreich). The area mapped in the scale of 1 : 10,000, represents a part of the highly metamorphosed Moldanubicum crystalline series of the southern Bohemian Massif.

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The rock types exposed in the area are mainly gneisses, schists, amphibolites, marbles and quartzites. The schists, quartzite and marbles sometimes contain small amounts of graphite. These rocks occur in small alternating bands very often within small distances.

On the basis of mineralogical composition and texture, different types of gneisses and schists can be recognised viz. mica-schist, kyanite-sillimanite schist quartzo-felspathic gneiss, two mica gneiss and hornblende gneiss. They show remarkable change in their grain size in different parts of the area being coarse-grained towards west and more fine-grained towards east. The amphibolites show a mineralogical assemblage of hornblende, plagioclase and biotite with garnet, sphene and pyrite as accessories. The marbles are of dolomitic, tremolitic, or diopsiditic. The presence of dolomite in the marbles is confirmed by X-ray analysis and U-stage investigation. The whole series is intruded by concordant aplitic and pegmatitic sills which are folded together with the host rocks. Some concordant bands of lamprophyre and diopsidite are also seen in the area.

The general strike of the rocks is N. 15. E. The dip ranges from 45 to 75 degrees to the east and the lineation trend generally N—S slightly dipping to the north (sometimes quite horizontal).

The petrofabric study of preferred orientations of quartz, biotite, calcite and dolomite in these rocks provide additional informations which are conformable with the field observations.

The petrological investigations of the amphibolites suggests that they are formed by the metamorphism of basic tuffs laid down with the associated sediments. The mineralogical assemblage of the different rock-types indicate that they were formed under metamorphic conditions of amphibolite facies from different sediments.

The contact between the Para-series and Spitzer Gneiss to the west is found to be transitional and in this respect the authors like to suggest that further investigations would lead to interesting results about the relationship between these two formations.

### **Observations on the Metamorphics of Steinegg, Lower Austria**

by R. V. R. RAU<sup>1)</sup> and K. SETHURAMAN<sup>2)</sup>

This work essentially contains itself to the structural analysis of the granulites and associated rocks in the Bohemian Massif around Steinegg (Lat. 45°37' & Long. 33°13') with petrographical, petrochemical and trace element studies of them. The principal rock types of this area are the granulites (sense-restricto, SCHARBERT, 1964), amphibolites and Gföhler gneiss. The associated rock types include pyroxene granulites, serpentinites, quartzites and pegmatites. The average modal composition of the principal rock types, as determined with the integration of thin sections are: Granulite- Quartz 41%, alkali feldspar 30%, plagioclase felds. 10%, garnet 9.5%, hypersthene 2% and accessories 2%; Amphibolite- quartz 9%, alkali feldspar 4%, plagioclase felds. 19%, garnet 18%, hornblende 46% and accessories 4%; and Gföhler gneiss-quartz 30%, orthoclase 45%, microcline 10%, garnet 3%, plagioclase felds. 1%, biotite 9% and accessories 2%. The plagioclase varies in composition from 28% An. in granulites to 48% An. in amphibolites.

A well developed lineation is observed in the granulites. The mesoscopic structural features observed in the field are correlated with the microscopic fabric diagrams. The general strike of the rocks varies from N 80° W to N 30° W with dips ranging from 35° to 55° in a southerly direction. The lineation in general strikes N 80° W and dips 8° due W. The lineation appears to be of secondary origin. The granulite as well as the Gföhler gneiss have the same trend.

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