Some Geological Studies in and Around the Big Quarry NW of Dürnstein in Lower Austria

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The Gföhler gneiss, amphibolites, biotite hornblende gneiss and paragneiss in and around the big quarry NW of Dürnstein in Lower Austrie are mapped and studied in the laboratory. The gneiss and amphibolites are trending NNE—SSW and dipping NW, whereas paragneisses are striking NNW—SSE with SW dip. The Gföhler gneiss and amphibolites are showing similar features in the field. The mineralogical compositions and structural features are determined under the microscope. The anorthite contents are determined with the help of U-stage. The anorthite contents are in Gföhler gneiss 20%—35%, in amphibolites 30%—55%, in biotite hornblende gneiss 20%—45% and in paragneiss 20%—35%. X-ray analyses and refractive index determinations are proving that the garnets from paragneiss and biotite hornblende gneiss are rich in almandite. The hornblende in amphibolites and biotite hornblende gneiss are actinolitic types. The almandite rich garnets, silimanite and high anorthite content are pointing that these rock formations are belonging to amphibolite facies of high grade metamorphism.

Geological notes on the Metamorphics of Arzberg Area Spitz a. d. Donau, Lower Austria

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Mapping and sampling exercise was carried out in the Arzberg area, NE Spitz a. d. Donau, Lower Austria (Austria, 1 : 50.000, Sheet 37 SW), in October, 1968. The area is further introduced with respect to its geological setting within the extensive platform of the Bohemian Massif. A geological map of the Arzberg area is produced. The laboratory work on the samples collected during the field work consisted of detailed petrography, X-ray diffraction, and ore microscopy.

Detailed petrography led to the subdivision of the rather extensive paragneisses into different types, viz., biotite gneiss, garnet biotite sillimanite gneiss, hornblende biotite gneiss, garnetiferous hornblende biotite gneiss, chlorite epidote gneiss, and epidote hornblende gneiss. The other metasediments in the area, quartzites and marbles, were also discussed. Plagioclase determinations with the Universal stage gave the compositional range An_{22} to An_{90} in the amphibolites. Modal analyses (by point-counting of two thinsections cut mutually at right angles form each rock sample so analysed) and photo-prints have been included to illustrate the usual mineralogy and fabric of the major rock types.

Opaque constituents are a striking feature of some of these rocks. By ore microscopy the following were identified: graphite (in a quartzite), ilmenite, pyrrhotite, chalcopyrite, pyrite (in a garnetiferous amphibolite), pyrite, pyrrhotite, and chalcopyrite (in a biotite gneiss).

Some concluding remarks are passed on the occurence of „rock-inclusions“ (termed pseudoxenoliths), amphibolite genesis, and mineralisation and mining activity in the area. The pseudoxenoliths are considered to be of a definitely different primary sedimentary unit which therefore responded differently (from the enclosing rocks) to tectonic events. The amphibolites are believed to be of orthoorigin, but it is suggested that a knowledge of their content of certain trace elements will be an added proof in support of this mode of origin. The marbles are considered to be recrystallized products of dolomitic limestones. The quartzites must have contained abundant organic remains in their sedimentary stage to account for the observed high content (23,5%) of graphite. The paragneisses are believed to have been formed from sediments of varying composition; from Al-rich pelitic materials (giving rise to garnet biotite sillimanite gneiss) to impure arenaceous sediments such as arkoses, feldspathic or argillaceous sandstones, and even of conglomeratic sandstones (the metamorphic products being the observed biotitic, sillimanitic, and garnetiferous quartz-feldspar paragneisses). The rocks in the Arzberg area are on the whole considered to be high grade regional metamorphics of the amphibolite facies. Their general structure is one of a typical S-tectonite.

The productive mining of limonitic Fe-ore which was worked, on and off, since 1600, came to an end in 1925. The deposit is now regarded as completely exhausted.

Geological Investigations for Petrographic Purposes

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Being one of the Candidates of the Unesco-Geology-Course for Post Graduate Training, which has been carried out under the direct supervision of the Geological survey of Austria — Vienna —, has enabled me to work in an area 400 meters NW of Dürnstein. The rock types which prevail in the area are: Gföhler gneiss, hornblende gneiss, amphibolite, and paragneiss. Then thin sections were made for further petrographic investigations. The main results which came out, after applying this petrographic technique are:

1. Gföhler gneiss has plagioclases 25% to 28% An content, so it falls in the oligoclase domain.

2. Amphibolite has plagioclases of 50% to 60% An content, so it falls in the labradorite domain.

3. Paragneiss has plagioclases of 25% to 35% An content, so it varies in composition from oligoclase to andesine.

Geology of Schlossberg Area, Spitz, Austria

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Petrographic descriptions and field observations for hard rocks covering an area of about 4 sq km within the Bohemian Massif in Spitz village, are represented in the present work. The different rock groups outcropping in the area include Spitz gneiss, paragneisses, marbles, calcsilicate gneisses, amphibolites, aplitic gneisses and pegmatites.

The preservation of basic plagioclase (labradorite) phenocrysts in the spotted amphibolites reflect their igneous origin. Trace element studies are preferrable for confirming this fact and are essential for throwing some light on the origin of the non-spotted varieties of amphibolites. The occurrence of boudinages of amphibolites and aplitic gneisses in a cataclastic to mylonitic marble country rock indicate the strong tectonism that affected the rocks of the area in general. The mylonitic nature of the pegmatites, on the other hand, could be explained either due to such tectonism or could have resulted during the intrusion of the pegmatite magma. The amphibolites and the aplitic gneisses are believed to have been intruded originally as doleritic, and aplitic (micrograntic) sills respectively, as they usually occur as boudinages lying parallel to the S-planes of the older rocks of the area. Intercalation of calcsilicate gneiss with paragneiss and marble is significant in throwing some light on the conditions of sedimentation of the original sediments.