CHLUPAC, I., HLADIL, J. (1992): New Devonian occurrences in the Jested Mts., North Bohemia. Casopis pro Mineralogii a Geologii, 37, 185 - 191.
HOLDER, M.T., LEVERIDGE, B.E. (1986): Correlation of the Rhenohercynian Variscides. - J. Geol. Soc. London, 143, 141 - 147.
MATTE, Ph., MALUSKI, H., RAJLICH, P., FRANKE, W. (1990): Terrane boundaries in the Bohemian Massif: results of large-scale Variscan shearing. - Tectonophysics, 177, 151 - 170.
OLIVER, G.J.H., CORFU, F., KROGH, T.E. (1993): U-Pb ages from SW Poland: evidence for a Caledonian suture zone between Baltica and Gondwana. - J.Geol.Soc. London, 150, 355 - 369.
PIN, Ch., MIERZEJEWSKI, M.P., DUTHOU, J.L. (1987): Rb/Sr isochron age of the Karkonosze granite from quarry Szklarska Poreba Huta and determination of its $^{87}Sr/^{86}Sr$ initial ratio. - Przeglad Geologiczny, 10, 512 - 517.
PIN, Ch., MAJEROWICZ, A., WOJCIECHOWSKA, I. (1988): Upper Palaeozoic oceanic crust in the Polish Sudetes: Nd-Sr isotope and trace element evidence. - Lithos, 21, 195 - 209.

RESULTS OF THE GEOPHYSICAL MEASUREMENTS IN THE BOHEMIAN MASSIF

ARIC, K., ADAM, A., GUTDEUTSCH, R., HEINZ, H., MEURERS, B., SEIBERL, W. & STEINHAUSER, P.

Institut für Meteorologie und Geophysik der Universität Wien, Österreich

Seismic exploration of shallow geological structures

The boundary region between the Moravicum and the Moldanubicum has been investigated on two 5 km long seismic profiles close to the Messener Bogen. The aim was to find out whether a connection between the structure of the Bittescher Gneis and the Dobra Gneis exists. Refraction seismic studies show that a correlation between the P-velocity in the uppermost crystalline rocks and the structures found in the geological map is obvious. CPM-sections of the reflection seismograms highlight a westward dipping structure down to 600 m depth. The reflection elements are linked together only in parts. A second reflection horizon has been found in about 1500 m depth. They may be due to the contact zone between the structures of the Bunte Serie (above) and the Bittescher Gneis (below).

Results of the magnetotelluric and audiomagnetotelluric measurements

The end points of the seismic profile of Messern (E-W) have been chosen as the locations of MT-measurements. 16 sites between them have been selected as measuring points of additional AMT-soundings. The different depth resolution of both, MT- and AMT-sounding revealed a complex structure of the underground with lateral and vertical variations of the electrical impedance. A shallow inversion zone may be interpreted as graphite or pyrite bearing layers. The MT sounding yielded a resolution of the lower boundary of the of the lithosphere at a depth of about 130 km.

Structure of the earth's crust from P- and S-waves generated by distant earthquakes

The seismograms of the eastalpine seismographic station network have been used for an analysis of the P- and converted waves from distant earthquakes with the aim of modelling the structure of the earth's crust below the respective station. One of these stations, ZWETTL has been equipped with a 3-component registration of the seismic motion and provided the chance of evaluting not only the P- but also the converted S-signals. The models of the earth's structure has been established by a comparison of experimental with synthetic seismograms. The mean p-velocity in the earth's crust is 6.1 km/s and the depth of the MOHO 34 km.

Deep seismic sounding on a long seismic spread

This seismic equipment was carried out next a drilling hole of 297 m depth not far from St. Martin/Weitra. This site with underground of granite has a thin whethering layer of appr. 20 m. The aim consisted in a test, whether or not reflections from the MOHO can be observed on this site. Therefore the greatest possible lenght of seismic spread of the device, 4750 m, covered with 96 channels has been chosen. The 50 kg shots were fired in the drilling. The seismogram sections exhibit only weak reflection energy at times smaller than 4 s. At 8 s the first considerable energy enhencement occurs, and at 10.3 s, 11.5 s and later broad band of reflected energy indicates that the lower crust and the upper mantel show much more and detailed reflection horizonts than the lower crust. The velocity measurements in the drilling hole and the seismic profile allowed a precise measurement of the P-wave velocity. The P-velocity is nearly constant down to depths of ca. 297 m.

Results of the gravity survey

A new gravity survey was performed resulting in about 5500 stations distributed regularly about the Bohemian Massif and the adjoining Molasse zone with station spacing of 3 km at maximum. The main tectonic units can be immediately recognised in the gravity map: The South Bohemian granite pluton is accompanied by a distinct negative anomaly. The transition to the metamorphic rocks adjoining in the East is characterized by a wide area with large horizontal gradients followed by a regional gravity high which extends far into the Molasse zone. This gravity high is superimposed by local anomalies of different sign which at several locations excellently coincide with density provinces determined by analysing surface rock samples. The gravity low of the Thaya pluton is followed in the east by a marked zone of positive anomalies. In this way an interesting negative-positive anomaly couple is formed which completely masks the gravity effect of the Molasse sediments with increasing thickness towards the East. As first interpretation step the magnitude of reduction anomalies caused by assuming constant rock density for the mass corrections has been investigated. Gravity map stripping has been performed for estimating the gravity effect of known crustal structures like the Mohorovicic discontinuity or the Molasse basement. The results indicate an high density upper crust west of the South Bohemian granite intrusion. They are confirmed by density deconvolution as well. Two dimensional modelling on four profiles covering the main tectonic units offers a first view to the upper crustal structures. A crustal

block of relatively high density which can be interpreted as deep reaching continuation of metamorphic rocks or as Brunovistulicum superimposed by Moldanubian and Moravian units is a general feature of different model conceptions.

Results of the magnetic survey

One of the main objects of the project S4710 was to clarify certain structural and tectonic questions in the Southern Bohemian Massif from magnetic data. This part of the Austrian territory was covered by aeromagnetic measurements in the late seventies and early eighties. The flight line spacing was 2 km; tie lines were flown with a distance of 10 km.

As the aeromagnetic survey in this area was flown in two different heights, in a first step the aeromagnetic data were transformed into a common survey level of 1400 m a.m.s.l. and afterwards reduced to the pole. Parallel to these activities new computer programs for 2- and 3-dimensional model calculations, including a package for graphic presentation of the data, were developed.

Looking at the magnetic data of the Southern Bohemian Massif from a qualitative point of view the southern part of Bohemian Batholite shows a rather quiet pattern of the geomagnetic anomalies, with the exception of contact zones between different granitic intrusions. In this areas interesting magnetic anomalies can be observed. These anomalies are caused by secondary formed magnetite which is usually concentrated in the alteration zones next to the above mentioned contact zones. This result is confirmed by air and ground radiometric investigations. Higher concentrations of potassium and sometimes of uranium can be also observed along these alteration zones between different granitic sequences.

2- and 3-dimensional model calculations indicate that the bodies causing the magnetic anomalies are quite narrow and the depth extension is approximately 1 km below surface. Furthermore, rather complicated cupola-structures, effected by tectonic events, have to be expected. The rock formations west and east of the southern part of the Bohemian Batholite (Bavaricum; Moldanubicum-Moravicum) are characterized by a different anomaly pattern. These rocks are mainly formed by metamorphic sequences. Similar to the geological findings the geomagnetic anomalies show that the transition between the Bohemian Batholite and the rocks of the Bavarikum is rather gradually, whereas in the E the contact with the rocks of the Moldanubicum-Moravicum is sharp. From a general point of view the Moldanubicum-Moravicum rock-complex shows higher magnetic susceptibility values. Towards E this complex is more and more covered by young sediments of the Molasse-zone and the Vienna Basin. A remarkable belt of magnetic anomalies, striking SSW-NNE can be found in this area. Model-calculations show that this anomalies are caused by bodies ranging from approximately 2 km to 6 km below surface. Their tectonic setting is still in discussion.