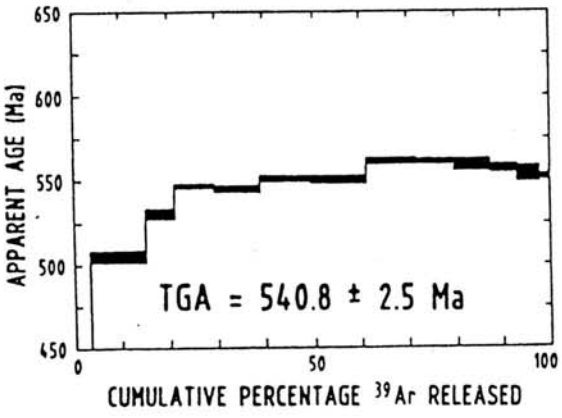

Fig. 2. $^{40}Ar/^{39}Ar$ release spectrum of a detrital muscovite from the Hochrindl Formation.

The enrichment of elements like V, Cr, Ni, and Sc is interpreted to reflect mafic input which is superimposed on a mature continental source (Fig.1). The $^{40}Ar/^{39}Ar$ release spectrum of a detrital muscovite displays an internally discordant pattern with model ages at c. 560 Ma of high temperature experimental increments and low temperature increments decreasing to c. 300 Ma (Fig. 2). We interpret this pattern to reflect post-metamorphic cooling after a Cadomian tectonothermal event within the source region and an in-situ overprint by a Variscan metamorphism after sandstone deposition.

The succession of highly explosive bimodal volcanic sequences and the composition of metasediments are interpreted to represent a continental syn-rift association formed during break-up of continental pieces along northern margins of Gondwana.

Reference

Taylor, S.R. – McLennan, S.M. (1985): The continental crust, its composition and evolution. Blackwell, Oxford.

AN APPROACH TO THE ORIGIN AND EVOLUTION OF MAGMAS IN LATE OROGENIC COLLAPSE BASINS – AN EXAMPLE FROM THE SAAR-NAHE-BASIN (SW-GERMANY)

C. ARZ, V. LORENZ

Geological Institute, University of Würzburg, Pleicherwall 1, D-97070 Würzburg, FRG

The late stage of continent-continent collisions is characterized by the formation of intermontane basins, a high heat flow, and a typical bimodal (basic/silicic) volcanism. The Saar-Nahe-Basin is a Variscan example of such a late orogenic collapse basin which contains basic/intermediate to silicic volcanic rocks. The distribution of the volcanic rocks in the SaarNahe-Basin does not show two distinct maxima of basalts and rhyolites as expected in a typical bimodal suite. However, there are many transitional intermediate rocks between both end members. O-isotope data from mineral separates in combination with trace element data of selected volcanic rocks are presented. These data are used to evaluate the origin and evolution of the volcanic rocks. Simple mixing calculations give first approximations to quantify the relative portions of crust and mantle during magma genesis.

In the Saar-Nahe-Basin the basaltic andesites are probably the result of partial melting of the upper mantle. The origin of the silicic rocks (rhyolites) is not yet clear: They can either be differentiated from a mantle derived magma or be a product of partial melting of the lower/middle crust. The intermediate, mainly dacitic rocks are probably a product of magma mixing which is supported by rounded to cauliflower-shaped basaltic inclusions within rhyolithic rocks and pseudomorphoses of amphiboles and pyroxenes.

Flow texture maps of the Donnersberg and the Lemberg show that both intrusions are composed of several partial intrusions. The Donnersberg, for example, consists of at least 15 partial intrusions. On the basis of these flow texture maps and a detailed grid of XRF-data contour maps are created to indicate spatial variations of specific elements across the intrusions. It is also possible to show the chemical influence of wall rock or adjacent sediments on the volcanic intrusions.

NEW RESULTS ON MINERAL ZONES AND ASSEMBLAGES IN THE CZECH PART OF THE KRÁLOVSKÝ HVOZD UNIT (KHU) (KÜNISCHES GEBIRGE)

J. BABŮREK[1], P. BLÜMEL[2]

[1] *Czech GeoIogical Survey, 11821 Praha 1, Klárov 3, Czech Republic*

[2] *Institute of Mineralogy, University Technische Hochschule Darmstadt, Schnittspahnstr. 9, 64287 Darmstadt, FRG*

The Královský Hvozd Unit (KHU) comprises metapelites and -psammites with intercalated graphite schists, calc-silicate rocks, marbles and (epidote-) amphibolites in the NW edge of the unit. On the basis of the metamorphic zonation established by Vejnar (1962) and Blümel and Schreyer (1976) a phase petrological analysis of the KHV mainly in metapelites was initiated. First results are:
1) The metamorphic zonation of the eastern part differs from that of the western part; in the south-eastern part a kyanite zone was re-delimited (Vejnar 1962).
2) Calcite-dolomite marbles with accessory margarite and Mg-chlorite and associated with Paleozoic metapsammites (Reitz 1992) give temperature of 425-455 °C (thermometers of Powell et al. 1984, and Rice 1976), which are compatible with the assemblages in the associated metapelites.
3) In Vejnar's staurolite zone the assemblage chloritoid-garnet-biotite-phengitic muscovite is observed.
4) Within the staurolite zone, the delimitation of which is impeded by the scarcity of proper rock compositions, first pyroxene-bearing calc silicate rocks are observed.
5) At similar grain size garnet porphyroblasts show bell-shaped Mn-zonation profiles (starting with 55 mol% spessartine) at lowest grades, a two-stage pattern growth followed by retrograde zonation in the andalusite zone, and flat profiles with about 15 mol% pyrope in the kyanite (-muscovite) zone.
6) In the sillimanite zone garnet seems to disappear by the decompression reaction grt + mus = sil + bio + qtz and zincian staurolite by the reaction of the type: sta = spl + sil + qtz.
Re-investigation of the metamorphic zonation in the KHU may shed new light onto the relation between the SW-Bohemian and the Bavarian part of the Moldanubian.

PALAEOZOIC GEODYNAMIC EVOLUTION OF THE SOUTHERN CENTRAL ANDES (NW-ARGENTINA, N-CHILE), AND IT'S BEARING ON THE POSTULATED LAURENTIA CONNECTION

H. BAHLBURG

Geologisch-Paläontologisches Institut, Im Neuenheimer Feld 234, 69120 Heidelberg, Germany

The region of the southern Central Andes of NW-Argentina and N-Chile has formed part of the South American continental margin since at least the Late Precambrian. In analogy to geodynamic models of the Mesozoic-Cenozoic active Andean margin, continuous subduction since at least the Ordovician has long been assumed for the Palaeozoic Andes. However, the wealth of new studies of Palaeozoic rocks indicates a segmented development of the Palaeozoic margin of western South America. The development of the south central Andean segment of NW-Argentina and N-Chile is summarized here in order (i) to elucidate the main processes which formed the proto-Andean orogens, and (ii) to evaluate the recently postulated hypothesis of repeated plate-tectonic interaction between eastern Laurentia and western South America during the Palaeozoic.

Since the end of the Pampean Orogeny in the early Cambrian, the geodynamic evolution of this part of Palaeozoic South America is characterized by tectonic regimes alternating between phases without subduction and associated magmatism (late Cambrian?, and Silurian-early Late Carboniferous) and phases of active subduction accompanied by arc magmatism (Early Ordovician, and Late Carboniferous-Permotriassic).

The inferred Late Cambrian margin in the Argentinian Cordillera Oriental is marked by an at least 1000 m thick succession of quartz arenites intercalated by shales (Mesón Group). It was deposited under shallow marine, partly tidal conditions on a west-facing platform. There is no magmatic activity of similar age recorded. The tectonic setting of this siliciclastic platform is unclear but the depositional patterns, slow subsidence rates, the absence of magmatism and the lack of a western margin make a passive margin regime very likely. During the Tremadoc to Early Llanvirn, the Mesón