large amphiboles and partial recrystallization of plagioclase. Mylonitic amphibolites consist of recrystallized and cataclastic amphiboles and recrystallized plagioclase domains showing core–mantle structures. Strains determined from the outlines of plagioclase domains show a rapid increase in deformation towards the Mold/Bar border. High strains are either prolate or oblate (Fig. 1) with mostly steep NE plunging mineral stretching lineation (Fig. 2a). The steep schistosity (60°–90°) follows the Mold/Bar border from NW to E dip (Fig. 2b). Rare shear sense indicators are consistent with uplift of the GAM near the Mold/Bar border. The steeply NE plunging mineral lineation defines the direction of movement along the Mold/Bar border.

The degree of recrystallization of plagioclase can be correlated with strain values at sample and map scale and increases towards the Mold/Bar border. Steeply dipping schistosity, steeply NE plunging lineations, large pressure gradients, and shear sense indicators lead to the model of an Acadian collisision between the Barrandian and Moldanubian terranes. Structures supporting the nappe model of Vollbrecht et al. (1989) based on DEKORP seismic profiles were not found.

The unusual geometry of the Bohemian Pfahl/Central Bohemian Shear Zone, one shear zone curving for 290°, can be explained by predeformational geometry of the edge of the Barrandian terrane. The collision lead to strong uplift and deformation of the edge of the SW Barrandian terrane. Acadian amphibole cooling ages in amphibolites with NE plunging mineral lineations are known from other parts of the western Bohemian massif, e.g. the Münchberg Gneiss Mass, the KTB deep drilling hole and the Zone of ErbendorfVohenstrauß. In the French Variscides Acadian movements were also recognized. In the Appalachians Acadian move ments lead to the accretion of terranes along the continental margin (Rast, 1989; Keppie, 1993). Similar processes could have worked in the European Variscides, too. It is suggested, that Acadian movements and metamorphism are widespread in the European Variscides. They can only be traced in areas without major late Variscan plutonism, that probably destroyed many Acadian structures.

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THE NORTH–WESTERN VARISCAN ODENWALD: HT–METAMORPHISM BENEATH AN ACTIVE CARBONIFEROUS BASIN

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The Variscan Odenwald is part of the Mid–German Crystalline Zone which partly represents mid–crustal levels of a magmatic arc. Around 360–330 Ma calcalkaline magmas synkinematically intruded along a major sinistral strike slip zone.

In the north–western Odenwald (Frankenstein area) abundant gabbros and diorites as well as few granodiorites intruded mainly amphibolites and minor metapelites. Prior to the intrusions these wall rocks were metamorphosed to regional amphibolite facies conditions at depth corresponding to only 1 to 2 kbar as it was shown by geothermobarometric studies of wall rocks using multivariant equilibria. Estimations of intrusion depth of the oldest gabbro intrusions correspond to this level. However, retrograde PT–data and estimation of intrusion depths of younger intrusions indicate an increase in pressure to maximal 3 kbar. Hence the PT–path was anticlockwise. Differential vertical movement was controlled by normal faulting concomitant with strike slip faulting. In the south–western prolongation of the strike–slip zone the Saar basin occurs with continuous sedimentation from Mid Devonian to Permian. From this configuration it is inferred that the major metamorphic imprint of the north–western Odenwald rocks occurred during subsidence underneath this basin. The high geothermal gradient results from extension as well as from voluminous accretion of basic magmas. A recent analogue is a pull–apart structure within a magmatic arc similar to the present Sunda arc.