beneath the different localities. The most important mantle processes are: (1) depletion of the mantle to varying extents by partial melting — this event is much more ancient than the subsequent events; (2) enrichment of the lithospheric mantle by the introduction of mafic melts from the deeper asthenosphere.

Most of the mantle enrichment is related to alkaline magmatism, including Late Cretaceous lamprophyric and carbonatitic magmas, and Neogene alkaline basalts/andesites. The resulting cryptic modal metasomatism (indicated by LREE-enrichment in the constituent clinopyroxenes) and modal metasomatism (indicated by the presence of interstitial hydrous phases and formation of amphibole veins) shows isotopic and REE similarities to the host alkali basaltic magmas.

Despite close proximity to regions of subduction-related magmatism, infiltration of subduction-related fluids or melts into the lithospheric mantle of the Carpathian–Pannonian region is not easily detected in REE and most isotopic compositions. High $\text{Sr}^{87} / \text{Sr}^{86}$ ratios and unusual enrichments in Pb isotopes in some xenoliths from the Balaton Highlands are the main indication of such subduction-related infiltration.

### Illite/smectite diagenesis in the Carpathian Foredeep; preliminary results and comparison with the East Slovak and Vienna basins

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The conversion of smectite to illite has been studied in the Miocene shales of the eastern part of the Carpathian Foredeep in Poland. The basin, whose Neogene evolution was affected by the final stages of subduction of the North European platform under the Carpathians, is characterised by relatively cool thermal conditions.

The transformation of smectite to illite through mixed-layer intermediates is the most important mineral indicator of diagenetic evolution of sedimentary basins.

The investigated samples of shales were taken from the three boreholes:
- **Jodkówka-4**: the Miocene sediments are buried under the 1345 m thick Carpathian overthrust;
- **Buszkowiczy**: the well is located at the front line of the Carpathian overthrust;
- **Zalazie-2**: the well is situated about 15 km north of the front line of the Carpathian overthrust.

Illitization of smectite has been studied in <0.2 µm fractions of shales by X-ray diffraction techniques of Jan Środnić.

In the three boreholes, diagenetic evolution of mixed-layer illite/smectite has been observed as a general trend of decreasing % smectite in mixed-layer minerals with depth. However, in Jodkówka-4 this process advances at slower rates (measured in % smectite/100 km below the onset of illitization) than in the other two boreholes. These differences are interpreted as related to the variations in thermal conductivity in different parts of the basin which, in turn, are due to variations in lithology (thermal conductivity is higher in psammitic than pelitic rocks). The Miocene of Jodkówka-4 is covered by the Carpathian rocks which have lower clay content than the Carpathian Foredeep sediments, therefore geothermal gradient and the degree of diagenesis in this region are lower than in more northern parts of the basin.

The illitization of smectite in the Miocene of Carpathian Foredeep has been compared with the data from the East Slovak and Vienna Basins which are intramountain depressions of the Alpine–Carpathian orogenic belt. The trends of diagenesis reflect general variations in thermal conditions between the basins. The degree of diagenesis in the Carpathian Foredeep and Vienna Basin is comparable as the basins are characterised by similar, relatively low geothermal gradient. The conversion of smectite to illite in the East Slovak Basin progresses much faster because the basin has very high heat flow.

### The 300-km-long Innsbruck–Salzburg–Amstetten (ISAM) fault system: A major displacement line in the northern Eastern Alps

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Detailed mapping in the Flysch zone and microtectonic survey allow to trace a large scale shear zone in the northern Eastern Alps between Innsbruck (Tyrol) and Amstetten (Lower Austria). Mosaicking the different fault segments to a continuous shear zone adds another order displacement line to the Miocene lateral extrusion of the Eastern Alps. This over 300-km-long fault system crosses the Northern Calcareous Alps (NCA), the Flysch zone, the Ultrahelvetic units and finally the Molasse zone. Minimum cumulative sinistral offset in the Flysch and Molasse zone is 48 km. The ISAM-fault therefore is of similar importance as the well known Salzach–Ennstal fault system which also originated during eastward lateral extrusion of the central Eastern Alps.

The NE-striking ISAM-fault is kinematically linked with the N–S trending Brenner normal fault which merge together near Innsbruck. Normal displacement of the Brenner line during unroofing of the Tauern window was trans-