

kilometers (>40 km) based on preliminary cross-sectional balancing efforts. These findings have an important corollary for the relative, pre-extensional position of the Northern Calcareous Alps (NCA) and the Transdanubian Central Range (TCR). Taking also into account the displacement on Miocene strike-slip faults in the NCA, e.g. the Salzach-Ennstal-Mariazell-Puchberg fault with a sinistral displacement of about 60 km, the restoration of Nealpine deformation brings the NCA and the TCR unexpectedly close to each other. In fact, some WNW-trending right-lateral strike-slip faults in the TCR (e.g. Telegdi-Roth line) are interpreted to be analogous to those described from the NCA (e.g. Wolfgangsee-, Windischgarsten- and Hochwart fault). These Cretaceous tear faults were reactivated during the Late Miocene as it can be documented by reflection seismic data in the subsurface of the Danube Basin and the NCA.

The structural correlation between the NCA and TCR based on the characteristic wrench fault pattern provides further evidence for the much debated interpretation of the TCR in terms of a Cretaceous nappe-system in an Upper Austroalpine (or "Ultrastyrrian") structural position. Furthermore, the recognition of regional-scale right-lateral strike-slip faulting in these major Alpine units has a significant impact on the kinematic/dynamic reconstructions of the Alpine-Carpathian-Pannonian area during Cretaceous and Tertiary times.

Tectonomagmatic constraints on the dynamics of the final stages of subduction in the Eastern Carpathians

Paul Mason¹, Hilary Downes², Ioan Seghedi³ and Alexandru Szakacs³

¹ NERC ICP-MS Facility, Imperial College, Ascot, U.K.

² Department of Geology, Birkbeck College, London, U.K.

³ Geological Institute of Romania, Bucharest

Changes in volcanic activity can be related to variations in critical tectonic processes responsible for melt generation. A rigorous investigation of magmatism in the Carpathian arc may therefore more closely constrain the style and timing of subduction in the Carpatho-Pannonian region.

The East Carpathian volcanic arc constitutes the youngest and most voluminous segment of subduction-related magmatic rocks in Eastern Central Europe. A general age progression of the climax of magmatic activity is seen along the East Carpathians from older volcanic structures in the north-west to the youngest in the south-east, a feature which is particularly striking over the final

200km of volcanic structures in Romania. Magmatism continued into the Plio-Pleistocene, significantly later than the perceived end of subduction along the Inner Carpathian arc which took place during the Miocene.

Trace element ratios in magmatic rocks from the East Carpathians are typical for subduction-related magmas and suggest an input of fluids from a dehydrating subducting crustal slab. A simple model of upwelling of hot mantle due to slab delamination and subsequent mixing with lower and upper crust cannot explain the chemistry of the East Carpathian magmas. It is necessary to have subduction to produce the volcanism. However, the relationship between the timing of subduction and the climax of magmatism remains unclear.

The migration of magmatic activity from north to south may be explained by a corresponding migration of the magma generating zone along the arc. Oblique subduction of a narrow oceanic basin or slab roll-back could create the necessary tectonic conditions for migration. Continental crust may have initially entered the subduction system in the north whilst oceanic subduction continued in the south. Subducted lithosphere would thus initially delaminate and break-off in the north of the East Carpathian arc and progress southwards with time. As more buoyant continental crust entered the trench, a slower subduction rate would lead to slab breakoff at shallower depths. If the slab broke off at shallow levels (<50km) in the extreme south of the arc, it may account for some of the unusual geological features (e.g. the eruption of alkaline magmas).

Tertiary tectonic evolution of Southern Carpathians external area - reconstruction using kinematic and depth data

Liviu Matenco¹ and Giovanni Bertotti²

¹ Faculty of Geology and Geophysics, Bucharest University, Romania

² Dept. of Sedimentary Geology, Vrije Universiteit, Amsterdam, The Netherlands

The evolution of Southern Carpathians external area is analysed by means of paleostress determination, outcrop to regional scale structures, as well as depth interpreted data. The main latest Cretaceous - Tertiary deformations can be summarised as following:

After the middle and late Cretaceous orogenic phases, the Southern Carpathians - Moesian platform system was affected by strike-slip deformation with NE-SW oriented compression and NW-SE tension. During Paleogene - Early