In Sicily, the onset of basin opening (Imerese-Sicanian) occurred during the Triassic. It was interposed between carbonate platforms (Panormide-Hyblean-Pelagian). In the basal deep-water sediments, lenses of olistostromes with olisholiths and basaltic extrusions related to crustal stretching were deposited at the basin margins. These olistoliths were derived from mass-wasting of the Late Permian-Lower Triassic carbonate platform. Late Triassic sedimentation (pelagic marls and limestones) suggests relatively quiet tectonic activity, followed by increased crustal stretching, as suggested by olistoliths of Lower Triassic clastic limestones embedded upwards. Jurassic-Early Cretaceous sedimentation is represented by deep-water siliceous marls and radiolarites, containing several horizons of carbonate turbidites and breccias derived from erosion of the fault-controlled basin flanks. From the beginning of Late Cretaceous, deposition of basin-plain marls and limestones indicates the mature stage of basin dynamics. Upward in the succesion, thick horizons of resedimented carbonate breccias are very common, indicating the onset of tectonic inversion, from pre-orogenic extension to the chain building.

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Pentlandite mineralization related to Albanian Ophiolites

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The Jurassic ophiolites in Albania are characterized by several mineralization types including chromites, Fe-Ni-Cu sulfides and arsenides, Fe-Ti-minerals and minerals of the Platinum Group Elements (PGE). Pentlandite-bearing mineralization is related to upper mantle serpentinized harzburgites, chromitite deposits associated with upper mantle dunites, dunites of the supra-Moho zone, ultramafic-mafic intrusions (wehrlites, lherzolites, pyroxenites and gabbros) and to cumulate layered sequences of olivine-gabbros and gabbronorites. Pentlandite occurs in several mineral associations including Ni-bearing sulfides, Fe-Ni-Cu-Co-PGE-bearing sulfides and chromite + Ni-bearing sulfides + PGM. It accompanies chromite, olivine, pyrrhotite, chalcopyrite, cubanite, magnetite, native copper, valleriite, mackinawite, heazlewodite, millerite and PGM. The chemical composition of pentlandite (metal: sulfur ratios, Fe:Ni ratios and Co and PGE contents) is variable depending on the geological setting, mineral associations and textural relationships. It is suggested that the pentlandite-bearing mineralization hosted within chromitite deposits, related to upper mantle dunites and dunites of the supra-Moho zone, is of primary magmatic origin, but the one hosted within upper mantle serpentinized harzburgites, ultramafic-mafic intrusions and to cumulate layered sequences of olivine-gabbros and gabbronorites is genetically related to hydrothermal activity combined with serpentinization processes, which played an essential role for the remobilization of some elements from the host rocks and the transformation of primary sulfides and PGM.

Maastrichtian dinosaurs in SW Transylvania (Romania)

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Although the first dinosaur discoveries from the Transylvanian Basin were made at Bărăbanţ near Alba-Iulia as early as the end of the 19th century, the Latest Cretaceous Transylvanian dwarf dinosaurs gained their worldwide notoriety only after Baron F. Nopcsa reported his first discoveries in the Haţeg Basin. Nopcsa realized the dwarfing tendencies of these dinosaurs and related this tendency to their limited environment, which he called “the

Haţeg Island". In order to defend the pattern he identified, he attempted to outline the spatial extension of this island, as supported by the distribution of illustrative non-marine sedimentary deposits. In this context, he discovered several new localities with dinosaur-bearing rocks. Among these, the most important ones are located in the Alba-Iulia area. These faunal assemblages seem to be coeval with those from the Haţeg Basin. The non-marine Maastrichtian deposits from Alba County accumulated after the Late Cretaceous "Laramian" tectogenesis, when a fluvial system evolved in the area of the present-day Carpathians. As a matter of fact, the sediments exposed in Alba County suggest similar environments to those from the Haţeg Basin. In the red mudstones and the channel sandstones of the Şard Formation, several vertebrate teeth and bones have been preserved. In this paleobiota, dinosaurs are well represented by the following taxa: titanosaurian sauropods, the basal hadrosaurid *Telmatosaurus transsylvanicus*, the euornithopod taxa *Zalmoxes shqiperorum* and *Z. robustus*, the nodosaurid ankylosaur *Struthiosaurus transylvanicus*, as well as various small theropods. Besides dinosaurs, there are crocodilians (Allodaposuchus and Doratodon), turtles, and lizards. Fishes, amphibians, birds, and multituberculate mammals are other vertebrates making up this assemblage. More often than not, the remains are fragmentary, scattered and weathered, except for those preserved within sediments of lacustrine origin.

Reverse fault system Cenade-Ruşi-Veseud, effect of the Carpathian tectonic phases

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The Transylvanian Basin is surrounded by the Apuseni Mountains, the Eastern Carpathians and Southern Carpathians. It has a roughly circular shape with Upper Cretaceous to Upper Miocene sedimentary fill reaching in some place up to 8 km in thickness. It is a post-tectonic basin and represents a typical back-arc basin starting to the Upper Miocene. Geological and geophysical data show that the sedimentary cover of the Transylvanian Basin has formed during at least seven sedimentary cycles: Permian – Triassic, Jurassic – Lower Cretaceous, Upper Cretaceous, Paleogene, Lower Miocene, Middle – Upper Miocene and Pliocene. Structural elements of the Transylvanian basin basement belong to the Inner Dacides, Transylvanides and Median Dacides resulted from subduction and collision processes, especially collision between the Foreapulian block and Getic block during to the Austrian tectonic phase (Albian Collision) and pre-Gossau phase. These compressional tectonic phases have generated in the Transylvanian Basin the north-south overthrust lineaments with an eastward vergence by extensional reactivation of old structures from Middle Triassic-Lower Cretaceous (normal system faults generated by the Thetysian spreading processes). Later, the Carpathian tectonic phases (Laramian, Old Styrian, New Styrian, Moldavian and Wallachian Phase), recorded, especially, in the Eastern Carpathians through the emplacement of the other Carpathian nappes (Outer Dacides, Moldavides) contributed to the thrust reactivation, some with the appearance of the new structural elements, northwards tilting of the pre-Miocene basement, basin subsidence, uplift and erosions in the Transylvania Basin.

An example on this way is the system of Cenade-Ruşi-Veseud reverse faults, which is a result of the Wallachian tectonic phase (Pliocene/Quaternary). The Middle Badenian Salt Formation overlies the Cenade-Rusi uplift and this uplifting was generated by the thrust Laramian tectonic phase. The system of Cenade-Ruşi-Veseud reverse faults was activated at the beginning of the Pliocene and it was ruled by a combined tectonokinetic-halokinetic mechanism. The structural map with isochronous (TWT) of the top of Salt Formation shows that fault has a sinuous trend with three segments: the Cenade is on N–S direction, the Ruşi segment becomes NW-SE orientated, and the last segment, the Veseud has a WNW-ESE trending with eastward vergence and affect sedimentary deposits, including Pliocene deposits. Along this system, the Badenian Salt Formation has a column diapiric shape. Due to the very