pelagic swell. The over-regional significance of this geodynamic episode in the northernmost margin of the Tethyan Ocean is documented also by foundation of the Proto-Silesian Basin. Chaotic type of sedimentation dominated during Late Jurassic times indicating early stages of the Proto-Silesian Basin opening with increased tectonic activity. The detritic material was supplied from two sources: from the Baška-Inwałd uplift separating the Proto-Silesian Basin and the Bachowice Basin located within the North European Platform, and from the island arcs within the Silesian Ridge separating the Proto-Silesian Basin and the Alpine Tethys. The biogenic material originated within shallow-water reefal and carbonate platform zones was transported by turbiditic currents from the uplifted structures on the Proto-Silesian Basin margins into the deeper zones of this basin. Both the calciturbidites and calcifluxoturbidites formed, constituting the main lithosome within the younger lithostratigraphic unit – the Cieszyn Limestone Formation. These deposits represent the oldest turbiditic currents sedimentation known from the Polish Outer Carpathian Basin.

Miocene Charophyta of Maoče, Pljevlja (Northern Montenegro)

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The siliciclastic sediments of Maoče, with its sand beds and sand lenses of fluvial origin, as the clearly featured former shoreline, characterize this remote gulf of DS Lake. Its shallow water is corroborated by the frequent appearance of desiccation cracks. The lacustrine influence is mirrored in rare marly interbeds. Gyrogonites with mostly smooth spiral cells also indicate a low water mineralisation. An age is determined by *Rhabdochara langeri*, the key fossil for Burdigalian equivalents of W Europe, found both in Maoče and close laying Pljevlja. *Nitellopsis merianii* is an Euroasian Miocene species. A large mammal, from Pljevlja - *Chalicotherium grande*, a small morph – indicates the Lower Miocene. An entire herd of *Chalicotherium* was killed by a catastrophic earthquake catting forest they inhabit. The tuff of Maoče was destroyed by fluvial and vawe actions; in mineralized lakes, as Pljevlja is, tuff was transformed into siderite. Basaltic flows cannot support age because of the melting of the lower crust part. So, the biostratigraphic age is the upper part of Lower Miocene.

Shows of lithospheric plates collision in region of Eastern Carpathians

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Classical shows of lithospheric plate collision in Carpathian region are known in the backside of Ukrainian Folded Carpathians and Trans-Carpathian flexure. These shows are: 1. Presence of sima (ophiolites) fragments in allochthonous occurrence. These are the complexes of basalts, andesite-basalts, trachytes that showed during the Upper Triassic – Lower Cretaceous. Fragments of ophiolites are known in the base of the Trans-Carpathian flexure, Marmarosh cliff zone and in the band of the thrust of Rakhiv-Burkut zone over the Krosno-Chornogora zone, as well as in the frontal part of the Marmarosh crystalline massif. 2. Post-orogenic magmatism is pronounced by Vygorlat-Gutynsk volcanic chain composed of basaltic andesites (70%), basalts (20-25%) and acidic differentiates (2-6%). Volcanic ridge stretches along the Trans-Carpathian flexure from the border with Slovakia to the town of Khust, where its strike changes to meridional and continues on the territory of Romania. 3. Increased heat flow in Trans-Carpathian flexure (more than 2 mkcal/cm^2/sec) in

comparison with 1,2-1,6 mkcal/cm^2/sec in Folded Carpathians; - considerable emergence of Moho border up to 25-30 km in Trans-Carpathian flexure in comparison with 55-65 km near Folded Carpathians and Carpathian foredeep. In Trans-Carpathian flexure the heat flow sharply increases to over 2 mkcal/cm^2/sec. Such values are characteristic to the Slovakian, Pannonian and Transilvanian depressions. 4. Variety of fluid shows on Carpathian border and in Trans-Carpathian flexure (gas fields, shows of oil, big amount of mineral water springs). In Trans-Carpathian flexure during the last time 5 gas fields have been discovered: Rusko-Komarivske, Stanivske, Solotvynske, Korolivske, Dibrovske and one carbon dioxide field (Martivske). Oil shows have been observed in salt mines near the towns of Solotvyno and Khust and in 6 wells at prospects of Solotvyno, Nonkove, Makarove etc. 5. Presence of gravity markers of collision area by which in Trans-Carpathian flexure is clearly fixed Maximum connected with marginal swell of Eurasian plate, Minimum connected with deep-sea gutter and again Maximum connected with plate plunge in flat area of subduction under Pannonian microplate. 6. Presence in Badenian and Sarmatian deposits of Trans-Carpathians flexure intrusion - granite-diorite-porphyries. 7. Ore mineralizations (basemetal and gold deposits): Biganske basemetal and Muzhyivske gold field in the zone of Beregiv horsts, as well as Saulyak gold field in the Marmarosh crystalline massif. 8. Thrust and fold structure of Carpathians. Presently the thrust and fold structure of Carpathians raises no doubts of the investigators. The Moho boundary shows a significant uplift (to 25-30 km) in Trans-Carpathian flexure comparing to its subsidence (to 55-65 km) below the Folded Carpathians and Carpathian foredeep along the line Beregove-Dolyna-Vyshnevets. The corresponding values are along the line Chop-Sambir-Gorohiv – 28-32 km in Trans-Carpathian flexure comparing to 55-65 km in the folded part of the Carpathians and Carpathian foredeep. The above-stated indicates that in Trans-Carpathian flexure there is collision and flat subduction of Eurasian plate under Pannonian microplate.

Geodynamics of Carpathian and Crimean fold belts formation

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Carpathian arched fold-and-thrust belt has formed as a result of its occurrence at the beginning of its formation within the rigid limits of Precambrian geo-structural units: Czech massif, Volyno-Podolian and Moesian plates, Pannonian middle massif with a consequent collision of a number of plates and microplates: of East-European microplate with African plate, which moves from south-west through the intermediate Adriatic and Pannonian microplates, of West-European microplate, which moves from west-north-west, with Pannonian microplate and of Arabian plate, which moves from south-south-east through Anatolian and West-Black Sea microplates with microplate of Transilvanian and Pannonian depressions. Differences in mass of plates and microplates are not big, that is why their collision occurs according to the scheme of collision and low-angle subduction under Pannonian and Transilvanian depressions of somewhat heavier and cooler plates from north-west, north-east and south-east. Collision belts of these plates and microplates are limited by fold-and-thrust subduction zones. Collision and low-angle subduction caused heating of the mantle mass, forming of the mantle asthenolith and its uplift, which resulted in intense heat flow and crust thickness reduction under Pannonian and Transilvanian depressions. This explains the high position of Moho under these depressions. As a result of subduction of the European plate under the Pannonian and Transilvanian microplates during Late Cretaceous till present, about 150 linear kilometers of substrate have been assimilated, and the Cretaceous-Paleogene flysch has been displaced from its platform basement and intensively deformed into structures of north, north-east and south-east vergence.

In front of the Crimean fold belt, on the north-east, the platformian part (Skythian microplate) is distinguished, further southwards – the system of depressions and somewhat