

Miocene deposits in the Carpathian Foredeep in Poland

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The origin of the Carpathian Foredeep is connected with the development of the Carpathians and their foreland. This foredeep may be recognised as a prolongation of the Outer Carpathians formed in final phases of this orogeny.

During the Lower Miocene the terrigenous deposits were formed in front of the Carpathians. In the eastern part they are approx. 3000 m thick and their age is determined as Eggenburgian–Badenian. In the western part the sedimentation began later, during the Ottnangian–Karpatian stages.

During the Lower Badenian the sea broke into the foredeep. The Opolian (Lower Badenian) terrigenous deposits

were formed, then the Bochenian (Middle Badenian) chemical-evaporite deposits and finally the Grabovian (Upper Badenian) over-evaporite sediments with a total thickness of approx. 800 m in the south and approx. 30 m in the north.

Further expansion of the basin over a whole area of the Małopolska mainland up to Holy Cross Mountains and far away to the Ukraine occurred in the Lower Sarmatian. The thickness of the Lower Sarmatian, developed as clayey-sandy sediments, reaches 3500 m. Within the Miocene basin two main units have been distinguished on grounds of sedimentary character and tectonic setting: 1 — **Stebnik unit** (K. Tołwiński) also called the **inner unit** (Eggenburgian–Badenian stages). Within the territory of Poland this unit covers only a small area from the eastern border to the Przemyśl

where it underlies the Carpathian overthrust. 2 — **Outer (autochthonous) unit**, occurring over an area north of the Carpathian margin to the Meta-Carpathian Swell. The age of the strata is Lower Badenian–Sarmatian. Recently, J. Kotlarczyk distinguished 3 — **Zgłobice unit**, occurring between Stebnik unit and autochthonous unit which comprises the Badenian–Sarmatian deposits and extends from the vicinity of Przemyśl to Bochnia. 4 — **Para-autochthonous Miocene unit** (Badenian–Sarmatian inclusive), occurring in front of the Carpathians in the Wieliczka–Pilzno area. It is removed from its primary position by the Carpathian flysch. Within the outer (autochthonous) unit the anhydrite horizon (Mid-

dle Badenian) and the so-called anhydriteless zone were distinguished.

Another position is shown by the Badenian deposits lying over the Carpathian flysch. They are partially folded and occur, e.g. near Nowy Sącz, Iwkowa, Grudna Dolna and Rozdziele. At the end of the Lower Sarmatian the Flysch Carpathians, together with the Stebnik unit (Lower Miocene) were finally overthrust on their Badenian–Sarmatian foreland. After regression of the sea the waters flowed to the Romania where the sedimentation lasted during Upper Sarmatian and Pliocene.