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THE SEQUENCE STRATIGRAPHIC FRAMEWORK OF SEDIMENTARY FACIES AND PALAEOCOMMUNITIES AT THE MIDDLE MIOCENE (LOWER BADENIAN) LOCALITY GAINFARN (VIENNA BASIN, LOWER AUSTRIA)

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No natural outcrops or roadcuts are available in the middle Miocene sediments of "Gainfarn Sand Formation" in the Baden Group, which is famous for its rich and well-preserved molluscan fauna. Therefore, seven deep trenches were excavated with backhoes in the farmland near the village Gainfarn in the Vienna basin. Seven artificial outcrops, resulting in a ca. 16 m long transect of lower-middle Badenian deposits, were examined and quantitative bulk samples with a standardized volume were taken from most beds at this locality.

The transect consists of pelitic and sandy to gravely shallow water deposits, which can be separated into two coarsening upward successions at the base and a fining upward succession at the top. The two basal successions are interpreted to indicate shallowing upwards, whereas the uppermost succession is interpreted to indicate a deepening upward of the depositional environment. Each succession is characterized by a different, conspicuous biofacies.

An approximately 80 cm thick bed in the upper part of the basal (coarsening- and shallowing upward) succession bears a fairly diverse but poorly preserved mollusc fauna, which is best characterized by its distinct *Panopea* horizons. Our detailed investigations revealed two distinct layers with in situ valves of *Panopea menardi* and two further beds enriched in disarticulated bivalves and gastropods. The *Panopea menardi* populations of Gainfarn yield specimens of up to 25 cm length and are therefore interpreted as mature populations. These infaunal "geoducks" prefer sandy or muddy bottoms where they bury themselves 60 cm to 2 m below the seabed. This indicates a considerable loss in sediment above both *Panopea* horizons in Gainfarn. Laterally the *Panopea* horizon passes into sand with large clypeasterids.

An approximately 1 m thick bed in the upper part of the middle (coarsening- and shallowing upward) succession contains a distinct lag horizon with winnowed boulders and shells, which is covered by a storm layer with a sharp relief. This horizon contains the large *Strombus* and *Glycymeris* shells, which are described as the typical Gainfarn assemblage in the older literature.

The base of the uppermost (fining- and deepening upward) succession contains a distinct oyster-vermetid biostrom. This biostrom has a total thickness of approximately 145 cm and is characterized by oysters and vermetids in growth position, cooccurring associated macrofauna (mainly small bivalves and gastropods, such as *Bittium reticulatum* and various rissoids) and rare trace fossils in a pelitic grey matrix. Actualistic comparisons indicate very shallow water conditions for this distinct assemblage. Upsection, it is covered by pelitic sediments, whose fossil content (e.g., nuculid bivalves) indicates a gradual deepening upward.

These three successions are interpreted to represent three parasequences. Accordingly, the two basal progradational parasequences might be part of a highstand systems tract and the deepening of the upper parasequence might point to a transgressive systems tract.

This interpretation fits very well to the sequence stratigraphic model of WEISSENBÄCK (1996). Based on seismic data and geophysical logs, WEISSENBÄCK (1996) depicted a sequence boundary, which separates a highstand systems tract (spanning parts of the Lower Badenian foraminifera eco-biozone Upper Lagenidae Zone) from a Lower to Middle Badenian TST (comprising the top of the Upper Lagenidae Zone and parts of the *Spirorutilus* Zone).

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The complex stratigraphic position of the Gainfarn section resulted in controversial datings in the older literature (Upper Lagenidae Zone in STEININGER et al. 1978 versus *Spirorutilus* Zone in BRIX 1988). Based on our results, we propose a correlation of the lower two parasequences with the HST1 of WEISSENBÄCK (1996), whilst the transgressive upper part of the section is associated with his TST2.