

## The terrace system of the Moselle river between France, Germany and Luxembourg: first results for a global correlation

In the French valley of the Moselle river, geomorphological research allow to recognize, downstream the confluence of the Moselle and the Meurthe rivers, an alluvial system of 7 alluvial formations above the floodplain. These formations correspond to 7 stepped terraces, called M1 to M7. Their relative height above the floodplain M0 are constant and can be estimated at +5 m (M1), +12 m (M2), +20 m (M3), +30-35 m (M4), +45 m (M5), +55-60 m (M6), and +70 m (M7). These units are dominated by residual deposits, which can be observed until the top of the Bajocian cuesta (+160 m relative height). Sedimentological analyses allow to distinguish the oldest levels (M4 and older) deposited before the Moselle piracy by the Paleo-Meurthe river, and the youngest levels (M3 to M0) deposited since the piracy. Indeed, the first units show sediments coming from the Permo-Triassic stratas (sandstones and conglomerates): quartz and quartzite pebbles, tourmaline and zircon which are typical of the upper basin of the Meurthe river. On the contrary, the youngest formations contain a lot of sediments (granitic pebbles, hornblende) coming from the crystalline basement which is essentially drained by the Moselle river.

This alluvial system can be observed too between Thionville and the German-Luxemburg boundary. The most developed units above the alluvial floodplain are the lower terrace M1, the levels M3 and M4 (between Koenigsmacker and Hunting) and the levels M6 and M7 upstream from Sierck. The units M2 and M5 are less developed and can only be recognized in a few areas.

Above these 7 alluvial formations, residual pebbles can be observed until the top of the Stromberg, between Contz and Schengen (+160 m relative height).

The disposition of the M0 to M7 units allows to define 3 main system of terraces separated by steep slopes: the "lower system" (M0, M1 and M2), at less than 20m relative height; the "intermediate system" (M3, M4 and M5) between +20 and +50 m relative height; and the "upper system" (M6 and M7) above +50 m relative height.

These 3 systems can be renamed using the German terminology (as used in the German and Luxemburger valley): they correspond to a lower terrace (Niederterrasse), a lower middle terrace (Untere Mittelterrasse) and an upper middle terrace (Obere Mittelterrasse).

Because of the lack of general studies between the French boundary and Trier, and because of the characteristics of the valley which is deeper, only a few studies were able to recognize several levels inside these 3 systems. However preliminary research downstream from Perl (Germany) and Schengen (Luxemburg) made it possible to find several lower terraces and several lower middle terraces. These first results will be completed by research in the whole valley (especially to find the traces of the Moselle piracy); this allows to expect the definition of a general nomenclature correlating the alluvial units without hiatus and being more precise than the actual reconstructions.

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