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Geological Mapping of the Brilon-Messinghausen Anticline near Rösenbeck, Brilon

The investigated area (Fig. 1) is located at the north-eastern edge of the Rhenish Slate Mountains in the vicinity of the villages of Rösenbeck and Messinghausen between the Brilon anticline in the north and the Ostsauerländer anticline in the south. The Devonian and Lower Carboniferous successions of the Givetian to Namurian are intensively folded. Two of these structures are the Messinghäuser Anticline and the Rösenbecker Syncline. In addition, N-S trending faults and W-E trending thrusts occur. The main interest in this region is to explain the distribution of Devonian and Lower Carbonifereous rocks in relation to the paleogeographic situation with its morphologically highly differentiated seafloor and the Variscan tectonic overprint creating a complicated pattern of structural features. In order to evaluate the possible interrelationships several sections were constructed to show an interpretation of the sedimentological, paleogeographical and tectonic relationships.

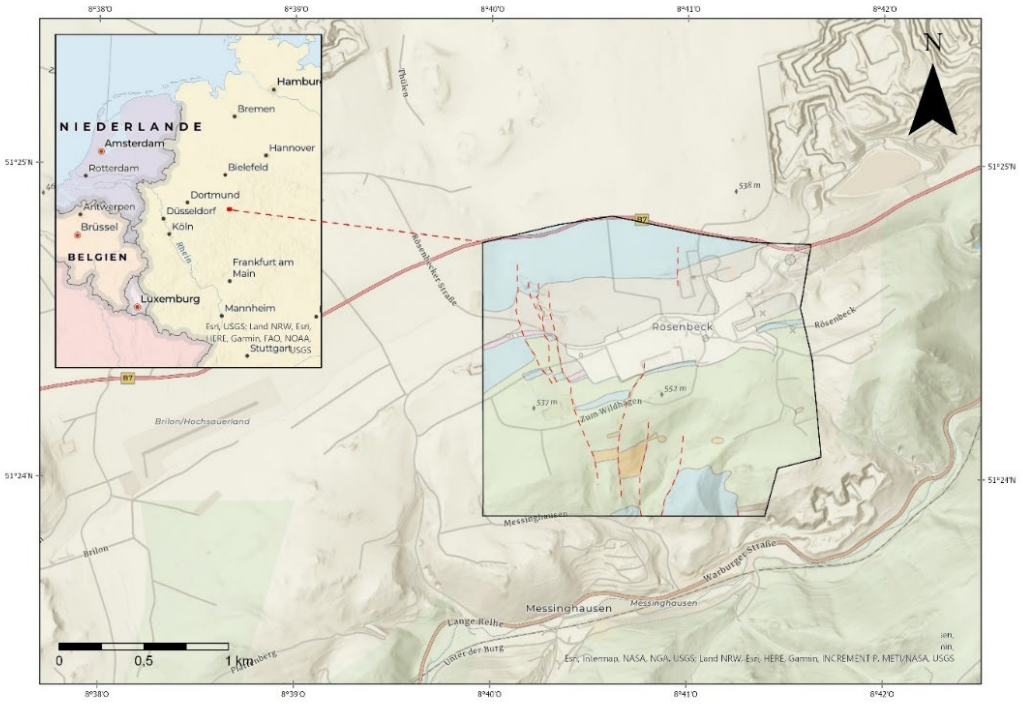

Fig. 1: Location of the investigated area

The Brilon stromatopore-coral reef (see rock specimens in Fig. 2) supplies sediment to the southern fore reef. This area is further subdivided by volcanic structures occasionally with small attolls on top. Further south, the reef-related rocks of the Givetian and Frasnian taper out and interlock with claystones. After the reef bodies ceased in the aftermath of the Kellwasser-Event, nodular limestones were formed on top of drowned ridges. In the basin clay sedimentation was going on. The onset of the Carboniferous is characterized by further basin sedimentation, as evidenced by siliceous and alum shales and siliceous limestones. They were deposited up to the middle Viséan. Near the reef several of these Famennian and Lower Carboniferous strata are missing or incomplete. Their distribution is heterogeneous, but this can be explained not only by thrusts, as at the direct reef edge of this region, but also by discontinuous sedimentation. From the middle Viséan on a flysch facies developed, due to increasing narrowing of the Rhenohercynian Basin.

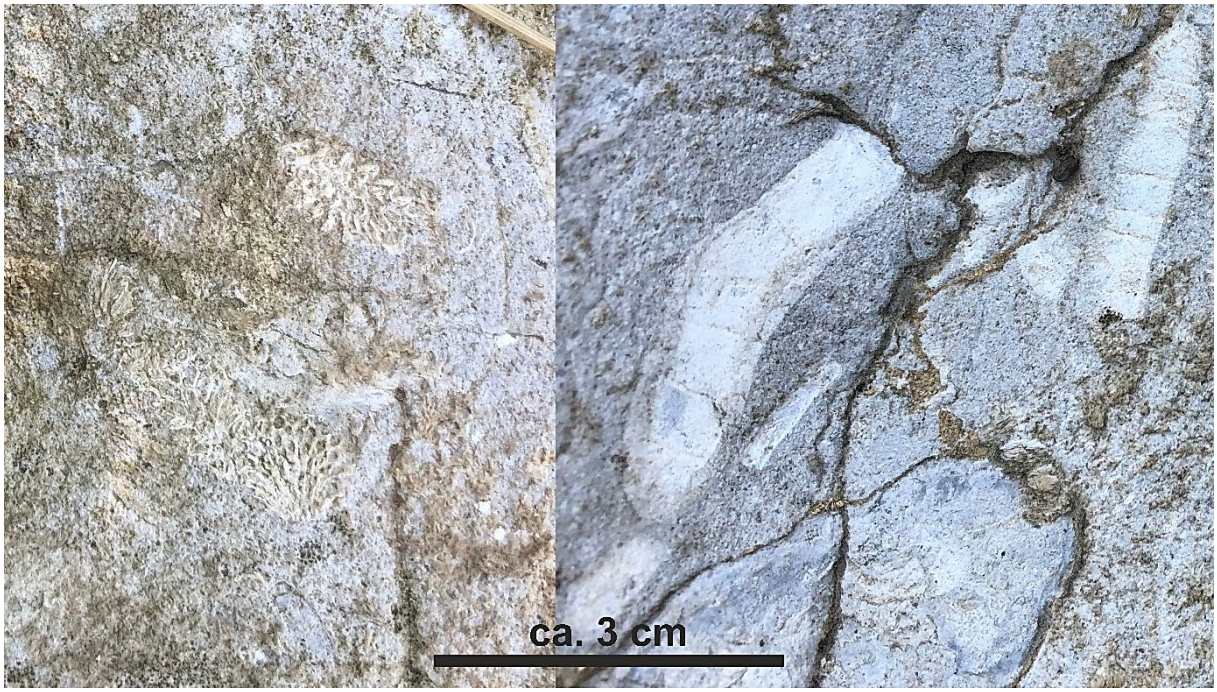

Fig. 2: Reef limestones; left: with tabulate corals, right: with stromatoporoids (type *Stachyodes*)

The paleogeography strongly influenced the distribution of facies later modified by the development of tectonic structures like synclines, anticlines and thrusts.