

The trilobite fauna from the Ordovician of the Ebbe Anticline (Rhenish Massiv)

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The Ordovician series of the Ebbe Anticline (Herscheider Schichten) [Herscheid Beds] consist lithologically of four units: Plettenberger Bänderschiefer [Plettenberg Banded Slate], Unterer (Kiesberter) Tonschiefer [Lower (= Kiesbert) Slate], (Rahlenberger) Grauwackenschiefer [(Rahlenberg) Greywacke Slate], and Oberer (Solinger) Tonschiefer [Upper (= Solingen) Slate]. In the Ebbe Anticline the two lowermost sequences (Plettenberger Bänderschiefer and Unterer Tonschiefer) are characterized by findings of *Didymograptus cf. artus* Elles & Wood 1901. According to the graptolite biozonation these beds are of Lower Llanvirn age (*Didymograptus artus* Biozone sensu Fortey & Owens 1987). Based upon *Holmograptus lentus* (Törnquist 1911) in the Plettenberger Bänderschiefer as well as on *Nicholsonograptus fasciculatus* (Nicholson 1869) in the Unterer Tonschiefer these units can be allocated to the *Holmograptus lentus* and *Nicholsonograptus fasciculatus* Zones (Lower Llanvirn = Lower Abereiddian sensu Fortey et al. 1995).

Contrary to the use of previous authors the upper sequences (Grauwackenschiefer and Oberer Tonschiefer) cannot be dated as Llandeilo or Caradoc, because the poor assemblage of megafossils indicates nothing more than an Ordovician age.

New research of chitinozoan faunas and Nd isotope data together with previously known age-ranges

suggest the following stratigraphical positions of the Herscheider Schichten (Samuelsson et al. 2002): Plettenberger Bänderschiefer: early Abereiddian, earliest Llanvirn; Unterer (Kiesberter) Tonschiefer: early to mid Abereiddian, early Llanvirn; (Rahlenberger) Grauwackenschiefer: Aurelucian, earliest Caradoc; Oberer (Solinger) Tonschiefer: late Caradoc.

In the Ordovician of the Ebbe Anticline trilobites are very rare fossils. The total number comprises only 80 specimens belonging to 11 families with 18 genera (modified after Koch 1999).

The following taxa occur in the Plettenberger Bänderschiefer (earliest Llanvirn) and Unterer Tonschiefer (early Llanvirn): The Cyclopygidae (approximately one half of all specimens) are present with the following genera: *Cyclopyge*, *Degamella*, *Microparia*, *Pricyclopyge*, *Ellipsotaphrus*, *Psilacella*, *Girvanopyge*, *Waldminia*. Further families and genera are *Metagnostidae* (*Corrugatagnostus*), *Asaphidae* (*Nobiliasaphus*, *Ogygiocaris*), *Nileidae* (*Barrandia*), *Dionididae* (*Dionide*, *Dionidella*), *Illaenidae* (*Illaenus*), *Harpetidae* (*Eoharpes*), *Cheiruridae* (*Areia*), *Pliomeridae* (*Placoparia*), and *Odontopleuridae* (*Selenopeltis*). Thus the trilobite fauna of the *artus* Biozone is dominated by Cyclopygidae and is therefore very similar to the Belgian Huy Formation (earliest Llanvirn); it also occurs in the *artus* Biozone in the Welsh Basin and in Bohemia.

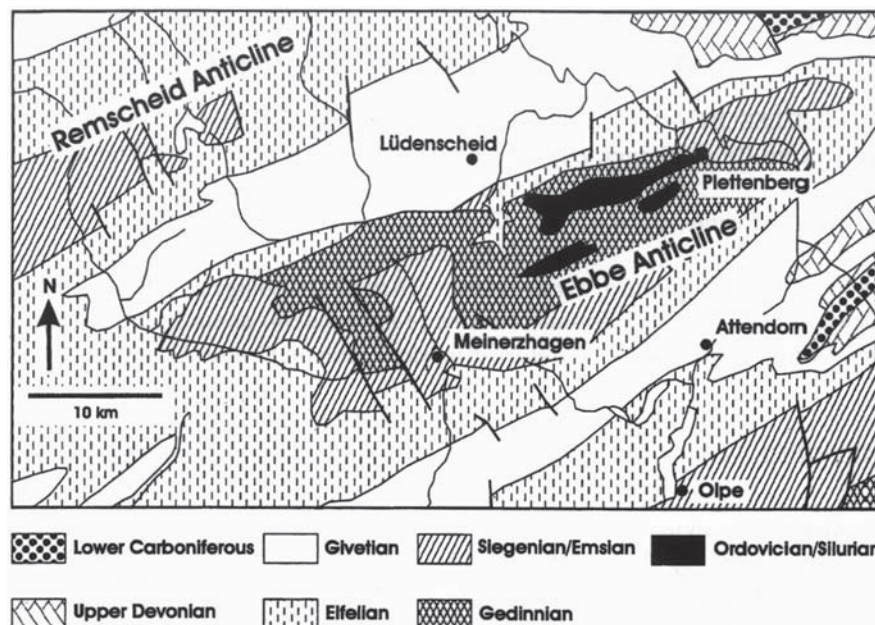


Fig. 1: Geological overview map of the Ebbe Anticline and its surroundings in the Rhenisches Schiefergebirge. From Samuelsson et al. (2002).

The sparse trilobites from the Grauwackenschiefer (earliest Caradoc) can be determined as *Microparia* (*M.*) *illaenoides* and *Illaenus* sp. From the Oberer (Solinger) Tonschiefer (late Caradoc) *Ogygiocaris* sp., *Cyclopygidae* indet., and *Eoharpes* sp. are recorded. None of these taxa is age-diagnostic, and there are no affinities to the age comparable with the Sart Bernard Formation (middle Caradoc).

Due to the occurrence of trilobites and graptolites as well as of some genera of cold-water acritarchs, the deposition area of the Ordovician rocks in the Ebbe



Fig.2: *Corrugatagnostus magnodosus* Koch & Lemke 1997, length 13 mm. Lower Llanvirn (Ebbe-Sattel).

Anticline is located on the Gondwana-shelf (peri-Gondwana) of the microcontinent Avalonia. Also the Nd isotope data of all Ebbe units can most easily be compared with those from Avalonia.

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Fig.3: *Eoharpes primus herscheidensis* Koch & Lemke 1995, length 18 mm. Lower Llanvirn (Ebbe-Sattel).

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