

Derivation of name: After the lithological character.

Synonyms: -

Lithology: Grey, splintery breaking, hard, well bedded limestone.

Fossils: Very rare and badly preserved undeterminable conodonts (SCHÖNLAUB, 1979).

Origin, facies: Carbonatic shelf deposits.

Chronostratigraphic age: ?Middle Devonian.

Biostratigraphy: -

Thickness: 50 m.

Lithostratigraphically higher rank unit: -

Lithostratigraphic subdivision: -

Underlying unit(s): Flaser Limestones (Lower Devonian).

Overlying unit(s): Flaser Limestones (Upper Devonian).

Lateral unit(s): -

Geographic distribution: E-GWZ; Styria, Eisenerzer Alpen.

Remarks: The rare and badly preserved conodonts are undeterminable. Dating is due to the position between conodont dated Lower and Upper Devonian Flaser Limestones (SCHÖNLAUB, 1979, 1980a).

Complementary references: TOLLMANN (1977), SCHÖNLAUB (1982a), EBNER et al. (1989), SCHÖNLAUB & HEINISCH (1993).

Flaserkalke / Flaser Limestones

Fritz Ebner

Validity: Invalid; informal working term (SCHÖNLAUB et al., 1980).

Type area: Eisenerzer Alpen; ÖK50-UTM, map sheet 4215 Eisenerz (ÖK50-BMN, map sheet 101 Eisenerz).

Type section: Not indicated.

Reference section(s): -

Derivation of name: After the lithological character.

Synonyms: -

Lithology: Light grey to whitish and reddish indistinctly to well bedded limestones.

Fossils: Badly preserved conodonts (FLAJS, 1967b).

Origin, facies: Basinal, pelagic facies.

Chronostratigraphic age: Upper Devonian (Frasnian-lower Famennian).

Biostratigraphy: Some distinct morphological features of the genus *Palmatolepis* indicate lower Upper Devonian, the occurrence of *Ancyrodella* Frasnian (FLAJS, 1967a; SCHÖNLAUB, 1982a).

Thickness: 10 m (SCHÖNLAUB, 1982a).

Lithostratigraphically higher rank unit: -

Lithostratigraphic subdivision: -

Underlying unit(s): Platy Limestones.

Overlying unit(s): -

Lateral unit(s): -

Geographic distribution: E-GWZ; Styria, Eisenerzer Alpen.

Remarks: Devonian limestones younger than early Famennian are not known from the Eisenerzer Alpen. How-

ever, conodonts of this interval are known from limestone pebbles in the early Carboniferous Crinoidal Limestone Breccia.

Complementary references: TOLLMANN (1977), SCHÖNLAUB (1979, 1980a), EBNER et al. (1989), SCHÖNLAUB & HEINISCH (1993).

Crinoidenkalkbrechie / Crinoidal Limestone Breccia

Fritz Ebner

Validity: Invalid; informal working term (SCHÖNLAUB, 1979; SCHÖNLAUB et al., 1980).

Type area: Eisenerzer Alpen; ÖK50-UTM, map sheet 4215 Eisenerz (ÖK50-BMN, map sheet 101 Eisenerz).

Type section: Not indicated; some sections are described from the mining levels Schuchart, Dreikönig, Antoni and Liedemann from the Erzberg (SCHÖNLAUB, 1979; SCHÖNLAUB et al., 1980).

Reference section(s): See above.

Derivation of name: -

Synonyms: "Kalkbrechie des Unterkarbons" (SCHÖNLAUB, 1982a).

Lithology: Banded brecciated limestone with components (maximum diameter: 15 cm) of light to dark grey, often sparry, tectonically flattened limestone in a matrix of crinoidal debris. At one site sparry pure crinoidal limestone is situated below the limestone breccia. Dense banded to phacoidal limestones with a mixed fauna of Devonian-lower Carboniferous conodonts occur as thin tectonic slices at the base of the Eisenerz Formation (SCHÖNLAUB et al., 1980).

Fossils: Conodonts (stratigraphically mixed faunas), crinoids.

Origin, facies: The onset of a marine transgression after an erosional gap due to karstification (EBNER, 1991).

Chronostratigraphic age: Formation of the breccia occurred during the Viséan. The reworked components indicate Devonian and lowermost Carboniferous.

Biostratigraphy: Breccia formation: *Gnathodus bilineatus* Zone; the reworked components indicate *asymmetricus*-, *(?)triangularis*-, *(?)crepida*-, *rhochoidea*-, *marginifera*-, *styriacus*-, *costatus/praesulcata*-, *sulcata*-, *duplicata*-, *(?)sandbergi*- and *anchoralis* zones of Upper Devonian and lower Carboniferous (SCHÖNLAUB, 1982a; SCHÖNLAUB et al., 1980).

Thickness: Maximum 10 m.

Lithostratigraphically higher rank unit: -

Lithostratigraphic subdivision: -

Underlying unit(s): Sauberg Limestone, Flaser Limestones (erosional disconformity).

Overlying unit(s): Eisenerz Formation.

Lateral unit(s): -

Geographic distribution: E-GWZ; Styria, Eisenerzer Alpen.

Remarks: THALMANN (1974) mentioned lower Carboniferous limestones from the Erzberg for the first time. Although any further information is lacking these limestones most probably correspond with the Crinoidal Limestone Breccia.

Complementary references: TOLLMANN (1977), SCHÖNLAUB (1980a), EBNER et al. (1989, 2008), SCHÖNLAUB & HEINISCH (1993).

Eisenerz-Formation / Eisenerz Formation

FRITZ EBNER

Validity: Invalid; first description (SCHÖNLAUB, 1979; SCHÖNLAUB et al., 1980) used in terms of a formation, but not formalized.

Type area: Eisenerzer Alpen; ÖK50-UTM, map sheet 4215 Eisenerz (ÖK50-BMN, map sheets 101 Eisenerz and 131 Kalwang).

Type section: Not indicated.

Reference section(s): -

Derivation of name: After the town Eisenerz situated near to the Styrian Erzberg, ÖK50-UTM, map sheet 4215 (ÖK50-BMN, map sheet 101 Eisenerz).

Synonyms: "Eisenerzer Schichten" (SCHÖNLAUB, 1979, 1982a; SCHÖNLAUB et al., 1980); "Grenzschiefer" (VACEK, 1903); "Zwischenschiefer" (JUNGWIRTH & LACKENSCHWEIGER, 1922).

Lithology: Grey, partly graphitic schists with intercalations of greyish-green to violet schist, sandy schists, thin bedded to platy brownish grey sandstone, black lydite and siliceous schists (SCHÖNLAUB, 1979, 1982a; SCHÖNLAUB et al., 1980). Often the schists are laminated and convolute bedding is locally present.

The Eisenerz Formation can be divided into two parts: at the bottom "oil" green sericite-quartzite schists occur, followed by schists, rich in graphite (HAJEK, 1966: p. 26, 27; SCHÖNLAUB et al., 1980). The inclusion of porphyroids (HAJEK, 1966) has not been confirmed later (SCHÖNLAUB et al., 1980). Most probably they form tectonic slices of porphyroidic materials (SCHÖNLAUB et al., 1980).

Fossils: -

Origin, facies: Probably fine clastic basinal environment.

Chronostratigraphic age: Unclear, but it should be younger than the Visean Crinoidal Limestone Breccia. However, a late Carboniferous age cannot be excluded (SCHÖNLAUB et al., 1980).

Biostratigraphy: -

Thickness: Approx. 80 m at the Erzberg (SCHÖNLAUB et al., 1980) and 100–150 m maximum at other localities (SCHÖNLAUB, 1982a). Mostly the thickness is tectonically reduced and sometimes the Eisenerz Formation is even missing (e.g., at the contact of Variscan nappe structures).

Lithostratigraphically higher rank unit: -

Lithostratigraphic subdivision: -

Underlying unit(s): Crinoidal Limestone Breccia.

Overlying unit(s): At Erzberg this unit forms the top of the "Liegendscholle" which is superposed due to Variscan Nappe tectonics by Silurian/Devonian limestones of the "Hangendscholle" (SCHÖNLAUB et al., 1980).

Lateral unit(s): -

Geographic distribution: E-GWZ; Styria, Eisenerzer Alpen.

Remarks: The outcrops described at Erzberg (SCHÖNLAUB et al., 1980) do not exist anymore due to mining operations.

Complementary references: TOLLMANN (1977), SCHÖNLAUB (1980a), EBNER et al. (1989), SCHÖNLAUB & HEINISCH (1993).

Radschiefer / Rad Schists

FRITZ EBNER

Validity: Invalid; not formalized, but used in terms of a formation since NIEVOLL (1983, 1987).

Type area: ÖK50-UTM, map sheet 4211 Neuberg an der Mürz (ÖK50-BMN, map sheet 103 Kindberg).

Type section: Not indicated. Detailed descriptions (NIEVOLL, 1983, 1987) derive from the section of the Steinbachgraben valley approx. 5.5 km NW Veitsch, ÖK50-UTM, map sheet 4211 Neuberg an der Mürz (ÖK50-BMN, map sheet 103 Kindberg).

Reference section(s): -

Derivation of name: After "Rad" which is a field name but also the name of a former inn (Radwirt; N 47°36'55" / E 15°27'14") in the Veitschbach valley, ÖK50-UTM, map sheet 4211 Neuberg an der Mürz (ÖK50-BMN, map sheet 103 Kindberg).

Synonyms: "Radschieferserie" (CORNELIUS, 1952a), "Rad Phyllit" (NEUBAUER et al., 1994), Rad subunit (NIEVOLL, 1983, 1987).

Lithology: Monotonous dark grey, quartzitic phyllite; at the base intercalation of < 10 m coarse grained sandstones with detritus deriving from the Blasseneck Porphyry (NIEVOLL, 1983, 1987).

Fossils: Slightly calcareous metasiltstones close to the base include badly preserved fossils (cystoideans, bryozoans, brachiopods/bivalves) (NIEVOLL, 1983, 1987).

Origin, facies: Fine clastic basinal environment.

Chronostratigraphic age: Uppermost Ordovician (Katian)–Lower Devonian (NIEVOLL, 1983, 1987).

Biostratigraphy: The age is constrained by the position above the Blasseneck Porphyry and conodonts of the overlying Metalliferous Limestone (EBNER, 1973, 1974; NIEVOLL, 1983, 1987).

Thickness: 400 m.

Lithostratigraphically higher rank unit: -

Lithostratigraphic subdivision: -

Underlying unit(s): Sedimentary contact to the Blasseneck Porphyry.

Overlying unit(s): Metalliferous Limestones (NIEVOLL, 1983, 1987).

Lateral unit(s): The fossiliferous siltstones at the base of the Rad Schists as well as the sandstones with porphyroidic detritus imply a correlation of the basal parts with the Polster Quartzite and the Peterbaumgraben Formation.

Geographic distribution: E-GWZ; Styria, ÖK50-UTM, map sheet 4211 Neuberg an der Mürz, ÖK50-UTM, map sheet 4212 Mürzzuschlag (ÖK50-BMN, map sheet 103 Kindberg).

Remarks: After the first description of CORNELIUS (1952a) the Rad Schists were subdivided by NIEVOLL (1983, 1987) into the Rad and the Stocker subunits. Both units are overlain by Metalliferous Limestones. Since the correlation between both units remains problematic the description above is restricted to the Rad unit only.

Austrian Stratigraphic Chart 2004 - Paleozoic

(sedimentary successions)

Austrian Stratigraphic Commission



ERA	SYSTEM / PERIOD / SERIES / EPOCH	STAGE / AGE	DURATION Ma	Global Classification					
				ERATHM / ERA	SYSTEM / PERIOD / SERIES / EPOCH				
PALEOZOIC	PERMIAN	CHANGHSINGIAN / Dorashanian	251	PERMIAN	MID PERMIAN / GUADALUPIAN / LOPINGIAN				
		WUCHIAPINGIAN / Dzhulfian	255						
		CAPITANIAN	260						
		WORDIAN	265						
		ROADIAN	270						
		PERMIAN	LOWER PERMIAN / CISURALIAN			KUNGURIAN	275		
						ARTINSKIAN	280		
						SAKMARIAN	285		
						ASSELIAN	290		
		PERMIAN	TRIAS			GZHELIAN	295	TRIAS	U. CARBONIFEROUS / PENNSYLVANIAN
KASIMOVIAN	300								
MOSKOVIAN	305								
BASHKIRIAN	310								
TRIAS	LOWER CARBONIFEROUS / MISSISSIPPIAN			SERPUKHOVIAN	315				
				VISEAN	320				
				TOURNAISIAN	325				
PERMIAN	DEVONIAN			FAMENNIAN	350	DEVONIAN	UPPER DEVONIAN		
				FRASNIAN	355				
				GIVETIAN	360				
		EIFELIAN	365						
		DEVONIAN	LOWER DEVONIAN	EMSIAN	370				
				LOCHKOVIAN	375				
		PERMIAN	DEVONIAN	LUDFORDIAN / GORSTIAN	380			DEVONIAN	MIDDLE DEVONIAN
				HOMERIAN / SHEINWOOD	385				
				TELYCHIAN	390				
				AERONIAN	395				
RHUDDANIAN	400								
DEVONIAN	UPPER ORDOVICIAN			DARRIWILIAN	405				
				TREMA-DOCIAN	410				
PERMIAN	DEVONIAN			WEN-LUD-LOCK / LOW	415	DEVONIAN	LOWER DEVONIAN		
				HIRNANTIAN	420				
				LLANDOVERY	425				
		AERONIAN	430						
		RHUDDANIAN	435						
		DEVONIAN	MIDDLE ORDOVICIAN	WOLYER	440				
				UGWA	445				
		PERMIAN	DEVONIAN	WEN-LUD-LOCK / LOW	450			DEVONIAN	LOWER DEVONIAN
				LLANDOVERY	455				
				AERONIAN	460				
RHUDDANIAN	465								
DEVONIAN	UPPER ORDOVICIAN			DARRIWILIAN	470				
				TREMA-DOCIAN	475				
PERMIAN	DEVONIAN			WEN-LUD-LOCK / LOW	480	DEVONIAN	LOWER DEVONIAN		
				HIRNANTIAN	485				
				LLANDOVERY	490				
				AERONIAN	495				
		RHUDDANIAN	500						
		DEVONIAN	UPPER ORDOVICIAN	DARRIWILIAN	505				
				TREMA-DOCIAN	510				
		PERMIAN	DEVONIAN	WEN-LUD-LOCK / LOW	515			DEVONIAN	LOWER DEVONIAN
				HIRNANTIAN	520				
				LLANDOVERY	525				
AERONIAN	530								
RHUDDANIAN	535								
DEVONIAN	UPPER ORDOVICIAN			DARRIWILIAN	540				
				TREMA-DOCIAN	545				



- Legend**
- pelagic, offshore, siliciclastic
 - pelagic, nearshore, calcareous
 - shallow marin, neritic
 - terrestrial-continental, coarse clastic
 - terrestrial-continental, fine clastic
 - evaporite (chloride, sulphate)
 - rhyolite, dacite
 - (basaltic) andesite, trachyandesite
 - basalt
 - phyllite
 - mixed-facies (in corresponding colors)
 - coal (may include several seams)
 - ? position/age doubtful/controversial
 - | equal units
 - \ older unit left \ younger unit right
 - hiatus
 - unconformity
 - GSSP
 - Fm. Formation
 - Ls. Limestone

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