

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.

Complementary references: TOLLMANN (1977), SCHÖNLAUB (1979, 1980a, 2001), EBNER et al. (1989), HEINISCH & SCHÖNLAUB (1993).

Erzführende Kalke / Metalliferous Limestones

FRITZ EBNER

Validity: Invalid; general working term for not subdivided Devonian limestones in the E-GWZ.

Type area: ÖK50-UTM, map sheet 4215 Eisenerz (ÖK 50-BMN, map sheets 101 Eisenerz and 131 Kalwang), ÖK50-UTM, map sheet 4211 Neuberg an der Mürz (ÖK50-BMN, map sheet 103 Kindberg).

Type section: -

Reference section(s): -

Derivation of name: After siderite-ankerite mineralizations which are frequently hosted by mainly Devonian limestones (CZERMAK, 1931; TOLLMANN, 1977; WEBER, 1997a, b).

Synonyms: See remarks.

Lithology: Variegated bedded flaser limestones hosting irregular metasomatic stocks of siderite and ankerite mineralizations (WEBER, 1997a, b).

Fossils: See remarks.

Origin, facies: See remarks.

Chronostratigraphic age: Devonian; see remarks.

Biostratigraphy: See remarks.

Thickness: See remarks.

Lithostratigraphically higher rank unit: -

Lithostratigraphic subdivision: -

Underlying unit(s): -

Overlying unit(s): -

Lateral unit(s): -

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

Remarks: Since the beginning of geologic research in the E-GWZ (STUR, 1865, 1866) the general term Metalliferous Limestones was used cumulatively for mainly Devonian limestones which include irregular stocks of metasomatic iron mineralizations. Later parts of these limestones, especially in the Eisenerzer Alpen, were assigned as informal lithostratigraphic units (SCHÖNLAUB 1979, 1980a, 1982a, b; FLAJS & SCHÖNLAUB, 1976). In the Veitsch area of the E-GWZ (ÖK50-UTM, map sheet 4211 Neuberg an der Mürz; ÖK50-BMN, map sheet 103 Kindberg) isolated outcrops of Metalliferous Limestones above the Rad Schists (NIEVOLL, 1983, 1987) yielded conodont faunas representing the entire Devonian period (EBNER, 1973, 1974; NIEVOLL 1983, 1987).

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

Veitsch Nappe

In the ASC 2004 the stratigraphic sequence of the Veitsch Nappe is shown in the Tournaisian to Moskavian parts of the column "E-Grauwackenzone" (E-Greywacke Zone) right of the Eisenerz Formation.

The Veitsch Nappe is situated in the E-GWZ (Styria, Lower Austria) at the tectonic footwall of the Greywacke Zone and is composed of Carboniferous (lower Visean–Moskavian) marine shallow water sediments. They were only affected by Alpine (Cretaceous) deformation and low grade metamorphism (RATSCHBACHER, 1984, 1987; NEUBAUER et al., 1994; RANTITSCH et al., 2004; EBNER et al., 2007, 2008). NEUBAUER et al. (1994) proposed to summarize these sediments within the Veitsch Group (not shown in the ASC 2004).

In the western part of the E-GWZ the sequence of the Veitsch Nappe was formerly subdivided into three formations: Steilbachgraben Formation, Triebenstein Formation, and Sunk Formation (RATSCHBACHER, 1984). In a restricted area SE Kapfenberg the Sunk Formation is superposed by (?) Permian ochre shales and sandstones (= Graschnitz Formation; NEUBAUER, 1983; NEUBAUER et al., 1994). It is not clear if RATSCHBACHER's subdivision into formations is also applicable for the eastern parts of the Veitsch Nappe. Nevertheless, magnesite and dark clastic sediments rich in graphite and plants resembling the Sunk Formation also occur in the eastern parts of the Veitsch Nappe. Especially in the magnesite deposit of Veitsch dolomites and clastics below the magnesite are rich in fossils (corals, brachiopods, crinoids, trilobites, gastropods, agglutinated foraminifers, spicula, ostracods; KOCH, 1893; KLEBELSBERG, 1927; HERITSCH, 1928a, 1930a; METZ, 1937; FELSER & FLÜGEL, 1975; HAHN & HAHN, 1977; KRÄINER, 1992). Trilobites indicate lower Visean (HAHN & HAHN, 1977) and corals upper Visean *Dibunophyllum* Zone (FELSER & FLÜGEL, 1975; FELSER, 1977), however, a correlation with the sequence of Hohentauern/Sunk is problematic.

The abundance of magnesite and graphite is also responsible to assign some parts of the Veitsch Nappe as the "Magnesite Carboniferous" (EBNER, 1997) and the "Graphite Carboniferous" (e.g., HAMMER, 1924). The Carboniferous of the Veitsch Nappe represents post-orogenic sediments (in relation to an early Carboniferous [= Bretonic] tectonic phase) deposited in a shallow marine foredeep (FLÜGEL, 1977; NEUBAUER & VOZAROVA, 1990; EBNER, 1992; EBNER et al., 1991, 2007, 2008). The metasomatic magnesite deposits, all most probably situated in the Steilbachgraben Formation or its equivalents, form the Veitsch Nappe magnesite (talc) district. The Sunk Formation hosts the Veitsch Nappe graphite district (WEBER, 1977a, b).

Steilbachgraben-Formation / Steilbachgraben Formation

FRITZ EBNER

Validity: Valid; formal description by RATSCHBACHER (1984).

Type area: Rottenmanner Tauern; ÖK50-UTM, map sheet 4214 Trieben (ÖK50-BMN, map sheet 130 Trieben).

Type section: Overlapping parts of the type section are situated around the abandoned magnesite mine NW of Hohentauern (N 47°26'53" / E 14°27'59"). Sections 8–11 (RATSCHBACHER, 1984: Figs. 1–3) are situated at the NE-ridge of Sunkmauer (altitude 1,180 m), the southern margin of the magnesite open pit, in the upper Steilbachgraben (N 47°26'22" / E 14°29'57" to N 47°26'26" / E 14°30'06") and within the magnesite open pit.

Reference section(s): -

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 / Dufuflian	255						
		CAPITANIAN	260						
		WORDIAN	265						
		ROADIAN	270						
		PERMIAN	LOWER PERMIAN / CISURALIAN			KUNGURIAN	275		
						ARTINSKIAN	280		
						SAKMARIAN	285		
						ASSELIAN	290		
		PERMIAN	UPPER PERMIAN / CARBONIFEROUS / PENNSYLVANIAN			GZHELIAN	295	PERMIAN	LOWER PERMIAN / CISURALIAN
KASIMOVIAN	300								
MOSKOVIAN	305								
BASHKIRIAN	310								
PERMIAN	UPPER PERMIAN / CARBONIFEROUS / PENNSYLVANIAN			SERPUKHOVIAN	315				
				VISEAN	320				
					325				
PERMIAN	LOWER PERMIAN / MISSISSIPPIAN			TOURNAISIAN	330	PERMIAN	LOWER PERMIAN / MISSISSIPPIAN		
				335					
				340					
		345							
		350							
		355							
		359.2							
		365							
		370							
		375							
PERMIAN	UPPER DEVONIAN	FAMENNIAN	380	PERMIAN	UPPER DEVONIAN				
		FRASNIAN	385						
		GIVETIAN	390						
		EIFELIAN	395						
		DEVONIAN	MIDDLE DEVONIAN			Dalejian	400		
						405			
		DEVONIAN	LOWER DEVONIAN			EMSIAN	410		
						415			
		PERMIAN	LOWER DEVONIAN			LOCHKOVIAN	420	PERMIAN	LOWER DEVONIAN
						425			
430									
435									
440									
443.7									
445									
450									
455									
460									
PERMIAN	UPPER ORDOVICIAN	LUDFORDIAN / GORSTIAN	465	PERMIAN	UPPER ORDOVICIAN				
		HOMERIAN / SHEINWOOD	470						
		TELYCHIAN	475						
		AERONIAN	480						
		RHUDDANIAN	485						
		HIRNANTIAN	490						
		495							
		498.3							
		499							
		500							
PERMIAN	MIDDLE ORDOVICIAN	DARRIWILIAN	505	PERMIAN	MIDDLE ORDOVICIAN				
		510							
		515							
		520							
		525							
		530							
		535							
		540							
		542							
		PERMIAN	LOWER ORDOVICIAN			TREMA-DOCIAN	545	PERMIAN	LOWER ORDOVICIAN
550									
555									
560									
565									
570									
575									
580									
585									
590									
PERMIAN	UPPER CAMBRIAN	PAIBIAN	595	PERMIAN	UPPER CAMBRIAN				
		600							
		605							
		610							
		615							
		620							
		625							
		630							
		635							
		640							
PERMIAN	MIDDLE CAMBRIAN	505	PERMIAN	MIDDLE CAMBRIAN					
		510							
		515							
		520							
		525							
		530							
		535							
		540							
		545							
		550							
PERMIAN	LOWER CAMBRIAN	555	PERMIAN	LOWER CAMBRIAN					
		560							
		565							
		570							
		575							
		580							
		585							
		590							
		595							
		600							



- 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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