

Gröden-Formation / Gröden Formation

HANS P. SCHÖNLAUB

Validity: Invalid; the term was introduced by RICHTHOFEN (1860: p. 47) in the Dolomites of northern Italy.

Type area: Gröden Valley (Val Gardena) in the Dolomites.

Type section: No formally designated type section. Bletterbach near Aldein-Radein would be the best candidate (LEONARDI, 1949, 1967; BUGGISCH, 1978; CONTI et al., 1986; MASSARI et al., 1988).

Reference section(s): ÖK50-UTM, map sheet 3110 Kötschach-Mauthen (ÖK50-BMN, map sheet 197 Kötschach) near the small village of Lanz (1,038 m) NNE of Kötschach along the forest road from Lanz to Dellacher Alm and Riedgraben SW of the village of Paternion, respectively (KRAINER, 1990b).

Derivation of name: After the village of Gröden in the Gröden Valley, Italy.

Synonyms: Grödener Schichten, Gröden Sandstein, Griffener Schichten (cf. TOLLMANN, 1977; NIEDERMAYR & SCHERIAU-NIEDERMAYR, 1982; KRAINER 1985, 1987a).

Lithology: In the Naßfeld area the Gröden Formation is developed as marine clastic sediments with carbonatic intercalations (BUGGISCH, 1978). It is predominantly composed of a red, partly greenish-grey alternation of dolomitic mud- and siltstones. Intercalated are nodular dolomitic marls or dolomites. The transition into the overlying Bellerophon Formation is characterized by interbedded grey siltstones, red mudstones, and bituminous dolomite beds.

Remarks: The intensively red-colored pelites of the Gröden Formation are one of the most conspicuous lithologies in the Upper Paleozoic rock sequence. They disconformably overly various metamorphic rocks, as well as marine Upper Paleozoic deposits north and south of the Periadriatic Lineament. In the Southern Alps, the Gröden Formation may rest on lower Paleozoic rocks, on the upper Carboniferous Auernig Group, or on the Lower Permian Trogkofel Limestone. At the base of the Gröden Formation coarse breccias and conglomerates occur (Tarvis Breccia, Trogkofel Breccia) due to partial reworking of the underlying deposits.

Fossils: In the eastern Carnic Alps rare occurrences of stromatolites, smaller foraminifers, ostracods and gastropods.

Origin, facies: The depositional environment of the Gröden Fm. has been controversially discussed in the literature as either predominantly continental or mainly marine. BUGGISCH (1978) favored prevailing marine conditions from fossils and geochemical data. In the Naßfeld area at least short-term marine incursions can be inferred from the marine fauna and bioturbation. However, pedogenic concretions, hardpans and root traces hint to prolonged time of subaerial exposure (SCHÖNLAUB & FORKE, 2007).

Chronostratigraphic age: Generally, a late Middle Permian (Guadalupian) to early Late Permian (Lopingian) age can be inferred from the position between the underlying Trogkofel Limestone, an assumed prolonged interval of erosion and non-deposition and the more fossiliferous Bellerophon Formation above.

Biostratigraphy: For a precise correlation the available fossil data from the Dolomites, i.e., plants, tetrapod tracks, and rare cephalopods cannot be used. In addition,

in thin sections stromatolitic algae, smaller foraminifers, ostracods and gastropods were observed (BUGGISCH, 1978).

Magnetostratigraphy provides additional results for global correlation: The "Illawara Reversal-Event", which has been identified in the Paularo section (MAURITSCH & BECKE, 1983) as well as in the Dolomites (DACHROTH, 1988), is dated as 265 Ma (latest Wordian/Capitanian) by MENNING (2001).

Thickness: Ranging between 30 m in the Reppwand cliff and some 100 m northwest of Passo del Cason di Lanza.

Lithostratigraphically higher rank unit: -

Lithostratigraphic subdivision: -

Underlying unit(s): Tarvis Breccia, Trogkofel Limestone or Auernig Group west of the Naßfeld area, lower Paleozoic strata or weakly metamorphosed rocks in the eastern Dolomites and western Carnic Alps, respectively.

Overlying unit(s): Bellerophon Formation.

Lateral unit(s): -

Geographic distribution: Carnic Alps of northern Italy and southern Austria (Naßfeld area, surroundings of Straniger Alm and Passo del Cason di Lanza, area surrounding mountain Seikofel east of Sexten in the western Carnic Alps).

Remarks: Italian name of the Gröden Formation: Val Gardena Formation.

Complementary references: SCHÖNLAUB & FORKE (2007).

Bellerophon-Formation / Bellerophon Formation

HANS P. SCHÖNLAUB

Validity: Invalid; the term was introduced by HOERNES (1876: p. 38–44).

Type area: ÖK50-UTM, map sheet 3116 Sonnenalpe Naßfeld (ÖK50-BMN, map sheet 198 Weißbriach), Carnic Alps, Austria.

Type section: Not defined.

Reference section(s): Eastern part of Reppwand cliff below "Sauboden".

Derivation of name: After the frequently occurring gastropod genus *Bellerophon* in this unit of the Dolomites.

Synonyms: Bellerophonschichten (HOERNES, 1876); Bellerophonkalk (HERITSCH et al., 1934); Bellerophondolomit (KAHLER & PREY, 1963).

Lithology: The lower part consists of dolomite, dolomitic marls and rauhacke, followed by platy to coarse bedded dolomitic grain- and mudstones. Grainstones yield abundant smaller foraminifers, dasycladacean algae and intraclasts. Mudstones contain mainly ostracods and radiolarians.

Fossils: Smaller foraminifers, dasycladacean algae, ostracods, radiolarians, gastropods and few conodonts.

Origin, facies: The sedimentary environment reflects an alternation of evaporitic and high-energy, open marine environments in the lower part and restricted, low-energy conditions in the upper part (BUGGISCH, 1975).

Chronostratigraphic age: Late Permian (late Wuchiapingian/late Dzhulfian to Changhsingian/Dorashamian).

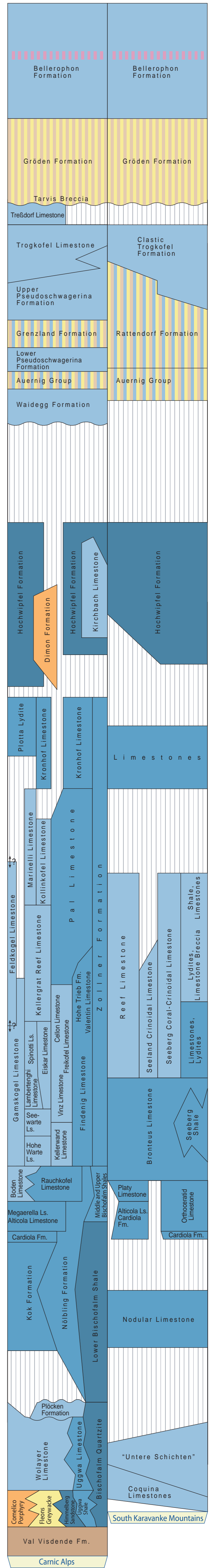
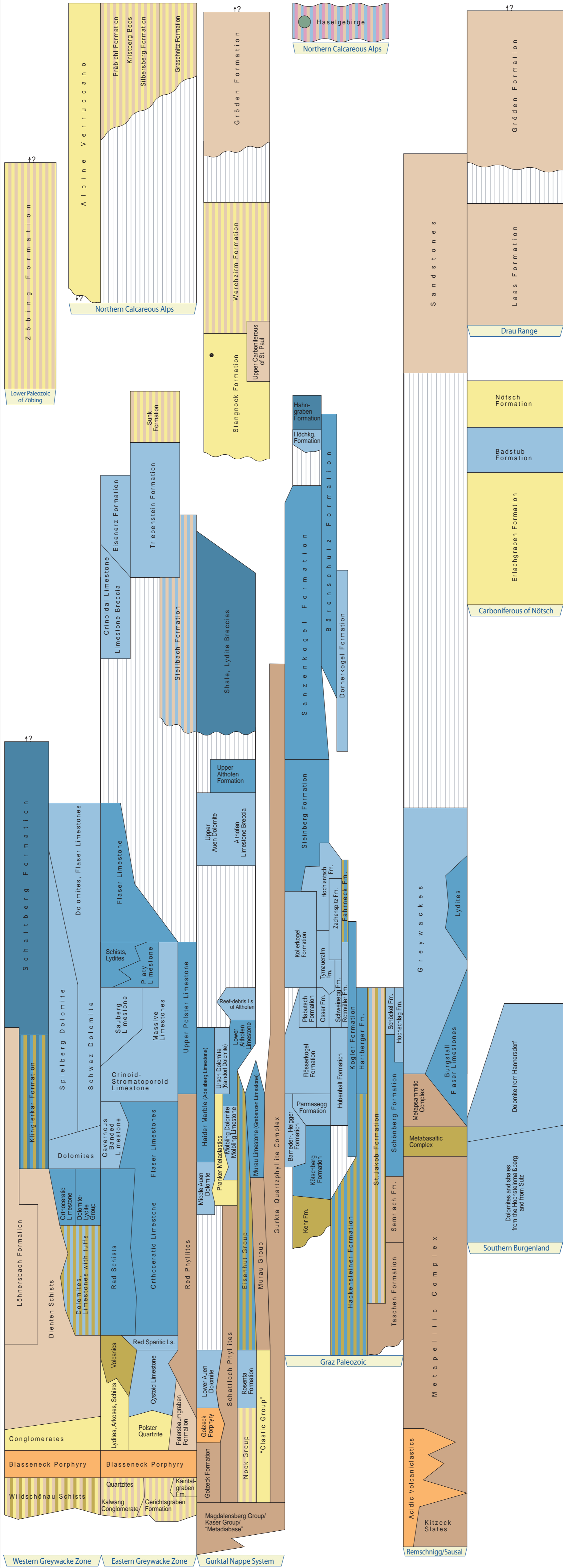
Austrian Stratigraphic Chart 2004 - Paleozoic

(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	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	330	DEVONIAN	UPPER DEVONIAN		
				FRASNIAN	335				
				GIVETIAN	340				
		EIFELIAN	345						
		DEVONIAN	LOWER DEVONIAN	EMSIAN	350				
				LOCHKOVIAN	355				
		PERMIAN	DEVONIAN	LUDFORDIAN / GORSTIAN	359.2			DEVONIAN	MIDDLE DEVONIAN
				HOMERIAN / SHEINWOOD	365				
				TELYCHIAN	370				
				AERONIAN	375				
RHUDDANIAN	380								
DEVONIAN	LOWER DEVONIAN			HIRNANTIAN	385				
				LLANDOVERY	390				
PERMIAN	DEVONIAN			WEN-LOCK / LOW	395	DEVONIAN	LOWER DEVONIAN		
				WEN-LOCK / LOW	400				
				WEN-LOCK / LOW	405				
		WEN-LOCK / LOW	410						
		WEN-LOCK / LOW	415						
		DEVONIAN	LOWER DEVONIAN	WEN-LOCK / LOW	420				
				WEN-LOCK / LOW	425				
		PERMIAN	DEVONIAN	WEN-LOCK / LOW	430			DEVONIAN	LOWER DEVONIAN
				WEN-LOCK / LOW	435				
				WEN-LOCK / LOW	440				
WEN-LOCK / LOW	445								
DEVONIAN	LOWER DEVONIAN			WEN-LOCK / LOW	450				
				WEN-LOCK / LOW	455				
PERMIAN	DEVONIAN			WEN-LOCK / LOW	460	DEVONIAN	LOWER DEVONIAN		
				WEN-LOCK / LOW	465				
				WEN-LOCK / LOW	470				
				WEN-LOCK / LOW	475				
		DEVONIAN	LOWER DEVONIAN	WEN-LOCK / LOW	480				
				WEN-LOCK / LOW	485				
		PERMIAN	DEVONIAN	WEN-LOCK / LOW	488.3			DEVONIAN	LOWER DEVONIAN
				WEN-LOCK / LOW	490				
				WEN-LOCK / LOW	495				
				WEN-LOCK / LOW	500				
DEVONIAN	LOWER DEVONIAN			WEN-LOCK / LOW	505				
				WEN-LOCK / LOW	510				
PERMIAN	DEVONIAN			WEN-LOCK / LOW	515	DEVONIAN	LOWER DEVONIAN		
				WEN-LOCK / LOW	520				
				WEN-LOCK / LOW	525				
				WEN-LOCK / LOW	530				
		DEVONIAN	LOWER DEVONIAN	WEN-LOCK / LOW	535				
				WEN-LOCK / LOW	540				
		PERMIAN	DEVONIAN	WEN-LOCK / LOW	542			DEVONIAN	LOWER DEVONIAN
				WEN-LOCK / LOW	545				
				WEN-LOCK / LOW	550				
				WEN-LOCK / LOW	555				
DEVONIAN	LOWER DEVONIAN			WEN-LOCK / LOW	560				
				WEN-LOCK / LOW	565				



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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Cutout and English adaptation of the "Die Stratigraphische Tabelle von Österreich 2004": Geological Survey of Austria

The Austrian Stratigraphic Chart 2004 - Paleozoic is a supplement of:
 Hubmann, B., Ebner, F., Ferretti, A., Kido, E., Krainer, K., Neubauer, F., Schönlaub, H.-P. & Suttner, T.J. (2014): The Paleozoic Era (them), 2nd edition. - In: Pillner, W.E. (Ed.): The lithostratigraphic units of the Austrian Stratigraphic Chart 2004 (sedimentary successions) - Vol. 1 - Abhandlungen der Geologischen Bundesanstalt, 66, 9-133, Wien.

Printing: Graßl Druck & Neue Medien GmbH, Bad Vöslau 2014

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