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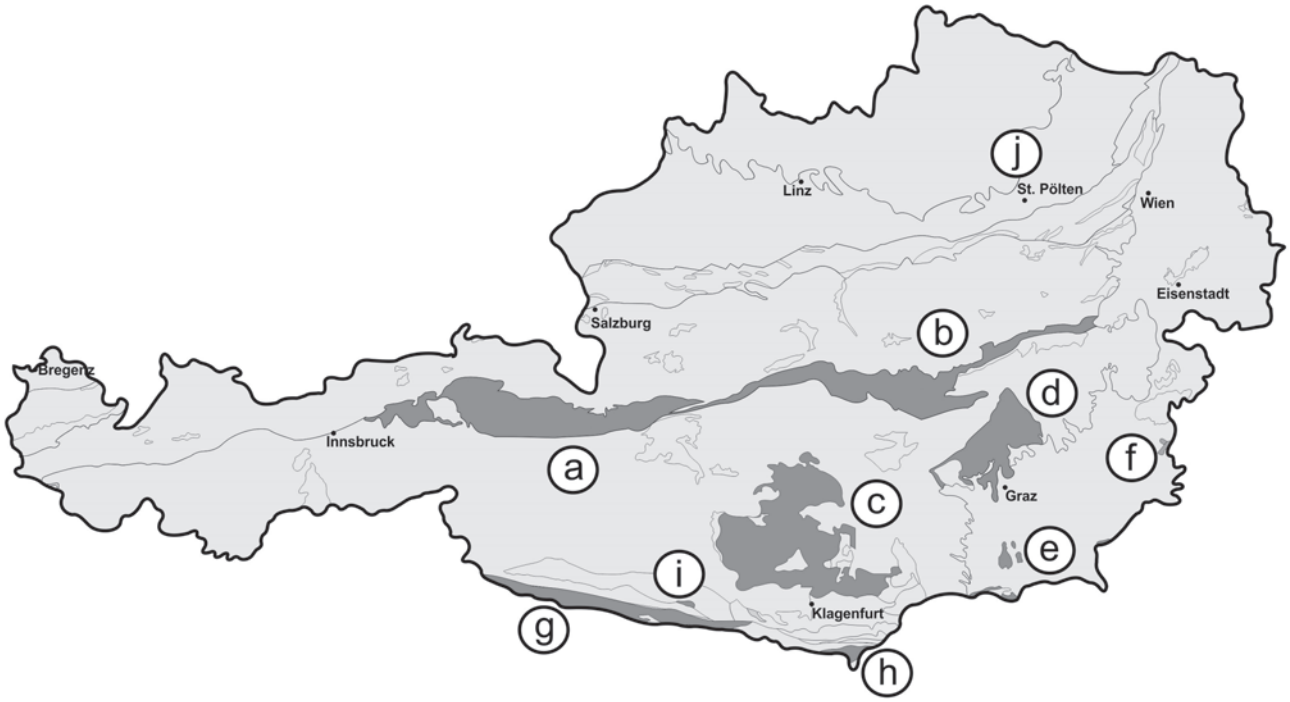
The lithostratigraphic units of the Austrian Stratigraphic Chart 2004 (sedimentary successions) – Vol. I – The Paleozoic Era(them)

Introduction

Profound studies of Paleozoic successions within Austria's territory go back to an amazingly long period of more than 150 years of research history. To the end of the first half of the 19th century all systems of the Paleozoic erathem (with the exception of the Ordovician) had been established thus enabling a systematic recognition and correlation of time-equivalent strata over different countries. As early as in 1843 Franz UNGER, paleobotanist at the Joanneum in Graz, recognized Devonian rocks (only four years after establishment of the system!) in Austria. A few years later, particularly during comprehensive geological mapping by the Austrian Geological Survey ("Geologische Reichsanstalt"; after the breakdown of the Austrian-Hungarian Monarchy the "Geologische Bundesanstalt"), Silurian successions were recognized by Franz HAUER in 1847. Permian rocks containing fusulinids were identified by Guido STACHE in 1872 and Ordovician strata, also by STACHE, in 1884. The Carboniferous ("age of carbonaceous limestone") was for a long time well-known in Alpine geology, however, for several decades this system remained a vast bin for unidentified Paleozoic rocks.

Since lithostratigraphic units are the basic entities of geological maps specific names were assigned to distinct lithological sequences already during early periods of geologic surveying. Initially naming was very general and frequently used in a dual sense to combine lithological features with (relative) age implications (e.g., "Uibergangskalk" or transitional rocks, placed between the "uranfängliche Gebirge" [= basement rocks containing no fossils] and the "Flötz-Gebirge" [= stratified and low-dipping rocks often holding fossils] in the sense of Abraham Gottlob WERNER'S stratigraphy). Following the fundamental ideas of Hollis Dow HEDBERG during the mid-1970s lithostratigraphic units more and more were based on their observable physical features only and not on their inferred age. Since 1999 a "Recommendation (guideline) to the handling of the stratigraphic nomenclature" (STEININGER & PILLER, 1999) exists which (at least) should regulate (new) designations. However, a synoptical compilation of lithostratigraphical units ("formations") as given herein, uncovers still a large number of the lithostratigraphical terms to be invalid.

Areas within Austria's borderlines exhibiting anchizonal to lower greenschist metamorphosed Paleozoic successions are remnants which were dismembered during Variscan and Alpine orogeneses and incorporated into the complicated Alpine nappe system. Today these Paleozoic areas are irregularly distributed (Text-Fig. 1). Within the Alpine mountain belt sequences belong to the "Upper Austroalpine Nappe System" (i.e., the Western Greywacke Zone (Tyrol, Salzburg), Eastern Greywacke Zone (Styria and Lower Austria), the Carboniferous of Nötsch, the Gurktal



Text-Fig. 1.
Regions of anchizonal to lower greenschist metamorphosed Paleozoic strata in Austria.
(a) Western Greywacke Zone; (b) Eastern Greywacke Zone; (c) Gurktal Nappe System; (d) Graz Paleozoic; (e) Remschnigg and Sausal areas; (f) Southern Burgenland; (g) Carnic Alps; (h) Karavanke Mountains; (i) Carboniferous of Nötsch; (j) Lower Paleozoic of Zöbing.

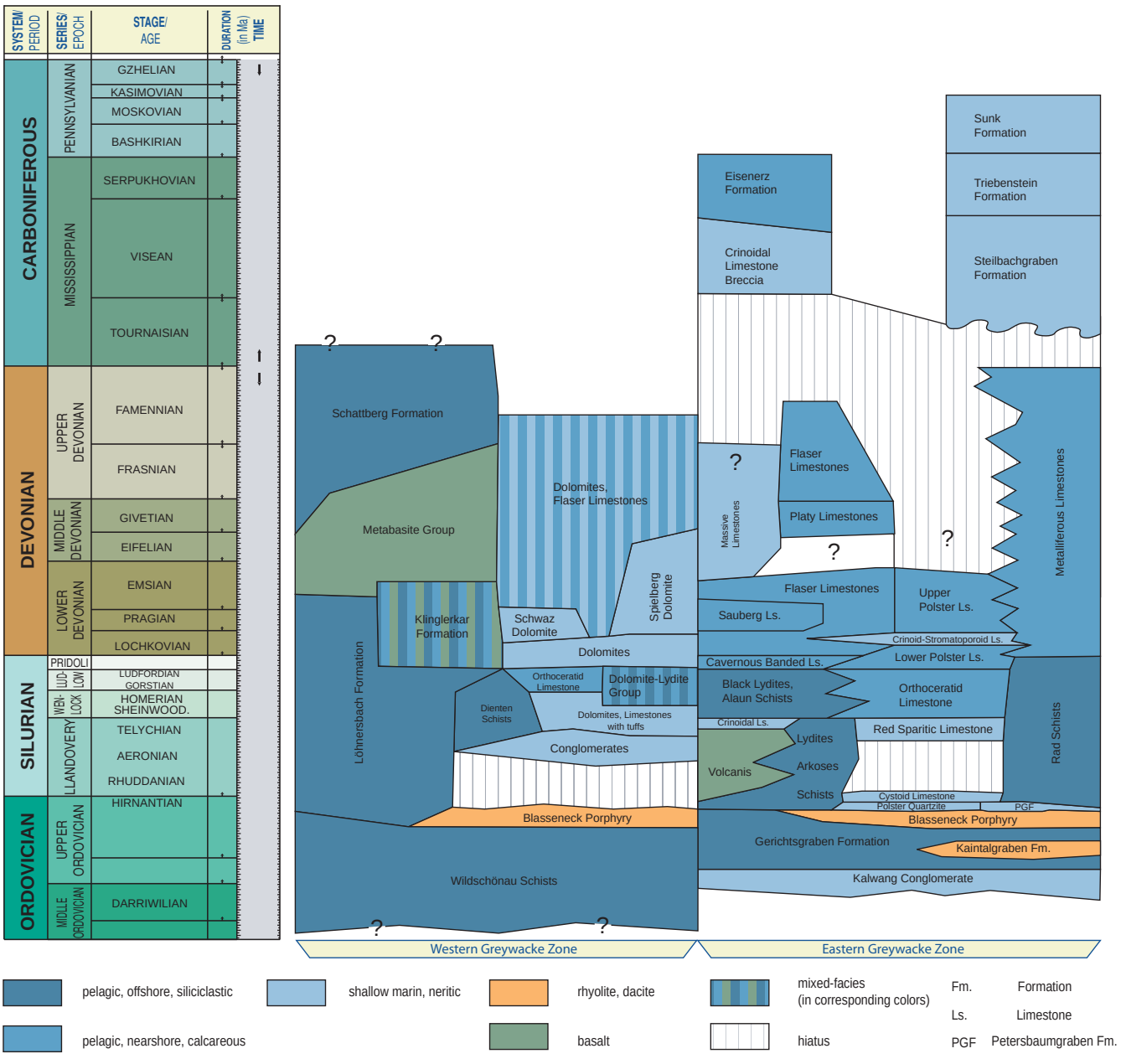
Nappe System, the Graz Paleozoic and some isolated outcrops in southern Styria (Remschnigg/Sausal) and Burgenland as well as the Southern Alpine System (Carnic Alps and the Karavanke Mountains; Southern Carinthia). Outside the Alpine region an isolated upper Paleozoic (Carboniferous, Permian) occurrence is known resting on crystalline units of the Bohemian Massif.

All Paleozoic occurrences together constitute a surface ratio of less than 10 % of the Austrian territory. More than 40 % of the Paleozoic area is covered by the Greywacke Zone, one-third by the Gurktal Nappe System; the Graz Paleozoic takes little more than 10 % and the Carnic Alps less than 10 % of the Paleozoic area.

Geologic units do not stop at national borders. Therefore a number of Italian colleagues kindly co-operated describing lithostratigraphic units of the Carnic Alps which are outcropping on both sides of the Austrian-Italian border.

In the following 191 lithostratigraphic units are briefly described. Some typological errors of lithostratigraphic names and graphic mistakes concerning stratigraphic ranges of formations as illustrated in the ASC 2004 had to be corrected. The Greywacke Zone featured too many inconsistencies and made a revision necessary which resulted in a differing conceptual base for the lithostratigraphic arrangement (Text-Fig. 2). The reader interested in the Greywacke Zone therefore is kindly requested to use the new graphic chart. Note also that explanatory remarks of the Greywacke Zone are only provided on lithostratigraphic units which are illustrated in the new concept (Text-Fig. 2).

Bernhard Hubmann



Text-Fig. 2.
Revised lithostratigraphic chart of the Western and Eastern Greywacke Zone.

Austrian Stratigraphic Chart 2004 - Paleozoic

(sedimentary successions)

Austrian Stratigraphic Commission

ASC

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

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

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