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Middle Triassic Paleotectonics of the Eastern and Southern Alps

Synsedimentary tectonic events seem to be responsible for the development of corresponding facies sequences of the Middle Triassic of the Eastern and Southern Alps. Taphrogenesis may have stimulated tectonic activity, the formation of simultaneous reef-basin systems, and the synchronous appearance of volcanism. The Middle Anisian, The Anisian-Ladinian boundary, and the Lower Carnian were periods of accelerated tectonic processes.

The sequences of the Alpine Triassic were deposited on an unstable shelf ("labile shelf"), which can be considered as an early stage of a geosynclinal development. With the end of the Triassic the shelf was finally transformed into a deep-sea-region. The deposits of the Alpine Triassic indicate a changing continental margin between the European platform and an opening ocean. The paleostructures examined follow approximately the E-W direction (rotations not included) and can be considered a post-Hercynian tectonic pattern persisting from Permian to Jurassic.

After the end of the mainly acidic magmatic activity (Bozner Quarzporphyr etc.) a basic alcaline (Na-rich) magmatism begins in the Upper Permian and continues until the base of the Middle Triassic (Reichenhall beds). A maximum of this magmatic activity was reached in the Ladinian. This principally alcali-basaltic volcanism takes place synchronously in the Southern Alps, the Drau Range and the Northern Calcareous Alps. This development of sodium-rich basic magmatites into alcalibasalts coincides with characteristics of rifting. Later, in the Jurassic, strong evidence of rifting is encountered in the north, in the Penninic area, but not in the Austroalpine region.

The general correspondance of facies sequences, synsedimentary tectonic events, and volcanism on both sides of the Periadriatic lineament is an important argument that a) the East- and Southalpine tectonic units were formerly in close vicinity, and b) the Periadriatic lineament had no great importance at that time.

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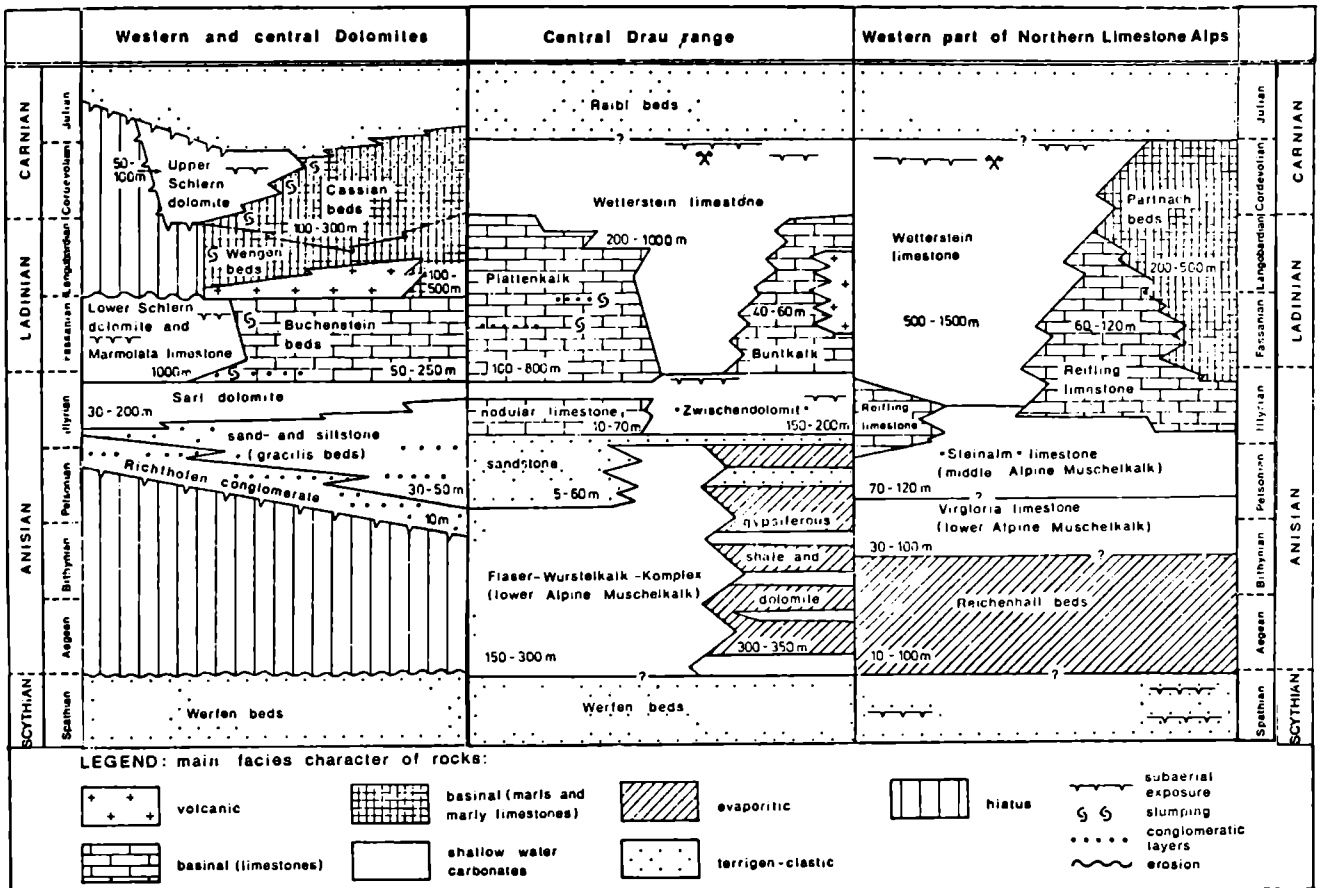
Western and central Dolomites
Central Drau range
Western part of Northern Limestone Alps
CARNIAN
LADINIAN
ANISIAN
SCYTHIAN
Julian
Cordevolian
Longobardian
Fassanian
Illyrian
Pelsonian
Bithynian
Aegean
Spathian
Raibl beds
50-100m
Upper Schlern dolomite
Cassian beds
100-300m
Wengen beds
100-500m
Lower Schlern dolomite and Marmolata limestone
1000m
Buchenstein beds
50-250m
Wetterstein limestone
200-1000m
Plattenkalk
100-800m
40-60m
Buntkalk
Wetterstein limestone
500-1500m
Partnach beds
200-500m
60-120m
Reifling limestone
Sarl dolomite
30-200m
sand- and siltstone (gracilis beds)
Richthofen conglomerate
30-50m
10m
nodular limestone
10-70m
Zwischendolomit
150-200m
Reifling limestone
sandstone
5-60m
Steinalm limestone (middle Alpine Muschelkalk)
70-120m
Virgloria limestone (lower Alpine Muschelkalk)
30-100m
gypsiferous shale and dolomite
Flaser-Wurstelkalk-Komplex (lower Alpine Muschelkalk)
150-300m
300-350m
Reichenhall beds
10-100m
Werfen beds
Werfen beds
LEGEND: main facies character of rocks:
volcanic
basinal (limestones)
basinal (marls and marly limestones)
shallow water carbonates
evaporitic
terrigen-clastic
hiatus
subaerial exposure
slumping
conglomeratic layers
erosion