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Basin in two parts: to the NW, a relatively undisturbed basin thinning out towards the Jura and filled essentially with USM deposits. To the SE, an older and deeper basin where UMM sediments are present and overlain by thick thrusted USM deposits. This configuration resembles that recently described from seismic in the Molasse Basin of Central and Eastern Switzerland.

The Mesozoic strata in the Swiss Molasse Basin: An overview

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Based on surface data and on 8000 km of seismic lines, 24 exploration wells have been drilled within the last 30 years through Swisspetrol and its partners in the Swiss Molasse Basin and adjacient regions. Of these wells 19 drilled into or through the Mesozoic strata.

Two characteristic stratigraphic sequences, mainly influenced by basinal facies in Western Switzerland and platform facies in Eastern Switzerland, show the different evolution during Mesozoic times. The Mesozoic sediments are bordered by two main unconformities. Below the underlaying "Base Triassic Unconformity" cristalline basement or permocarboniferous sediments are found. Above the predominantly carbonaceous sediments of Mesozoic age, the clastic Molasse sequence is overlaying the "Base Molasse Unconformity". These two unconformities mark not only two tectonic events but also a change in the depositional environment.

The facies and distribution of Mesozoic sediments in the Swiss Molasse Basin show the migration of the trough axis and the depositional environment during time. These movements are induced by tectonic movements along different tectonic trend lines. Transpressive faulting is an important process in forming the Mesozoic realm in the region of the future Swiss Molasse Basin.

The Basal Tertiary unconformity in the Helvetic realm

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In the Helvetic domain, including the Aar Massif, the onlap of shallow water sediments on the basal Tertiary unconformity which occurred between the Middle of the Paleocene and the Late Eocene, reflects the progradation of the coastline in NW direc-

tion and the onset of the perialpine basin which, by further migration was subsequently becoming the Molasse basin. Origin, evolution and migration of this basin is mainly the effect of the overload caused by the arriving higher nappe units. During the late Eocene subsidence is enhanced by the formation of SW-NE striking normal faults which controlled the pattern of sedimentation during that period.

The two first transgressive events in the middle and at the end of the Paleocene are restricted to southeastern areas and the corresponding sediments in many areas underwent erosion during the following regressive phases, thus reflecting mainly eustatic sea level changes. The Einsiedeln Formation of Cuisian age covers wide areas in the highest nappes of Eastern to Central Switzerland and, after a phase of strong subsidence, is followed by the hemipelagic Globigerina marls of Middle Eocene age. The unconformity at the base of these Paleocene and Eocene formations shows virtually no effects of subaerial erosion. Further to the North and to the West the Middle Eocene Bürgen and Klimsenhorn Formations reflect two subsequent transgressive events, both induced by sea level rise, but followed by strong subsidence of the corresponding areas during the Late Eocene. In northwestern direction increasing traces of subaerial erosion are noted and, in the Helvetics of Western Switzerland and at the northern border of the Aar Massif in Central Switzerland, strong carstic erosion of the Mesozoic limestones occurred prior to the Late Eocene transgression. The arrival of the higher nappe units therefore not only produced a strong subsidence of the foreland but at the same time a corresponding forebulge uplift in the adjacent northwestern areas.

Special conditions are noted in the north-helvetic areas of Western Switzerland where the Basal Tertiary subcrop map shows some undulations, and the Aiguilles Rouges Massif was strongly uplifted, tilted and deeply eroded in its southern part during the Late Eocene.

Mesozoic subsidence analysis from the Jura to the Helvetic realm

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Based on a palinspastic restoration of the Helvetic realm, the Swiss Plateau and the Jura, the Mesozoic subsidence history is reconstructed from outcrop and borehole data for more than 70 sections. The following parameters were taken into account for each lithological unit: age of sediments, compaction corrected sediment thickness (Sclater & Christie 1980), depositional depth estimations, erosion and eustatic sealevel corrections (long term curve of Haq et al. 1987). (See Funk 1985, Wildi et al. 1989 and Loup, this volume, for more technical details).

After removal of the sediment loading effect, tectonic subsidence curves can be constructed; they allow the investigation of the driving mechanisms of subsidence.