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Titl:

On the Problem of Intermalmian Gravitational Sliding in the area of Hallein-Berchtesgaden

Clays of Upper Permian Haselgebirge, exposed in the area of the cement-quarry St. Leonhard-Gartenau south of Salzburg, form the core of a N-S striking anticline in a length of one kilometer. Because of its position it can be co-ordinated with the salt-bearing clays of the zone Hallein-Berchtesgaden of Hallstatt facies. Above the sedimentary contact between the Haselgebirge and the clayey, pelagic Oberalm beds (Tithonian-Berriassian), building up the flanks of the anticline, there are rhythmically intercalated breccias rich in components of Upper Permian Haselgebirge clay together with allo-dapic limestones. That the Haselgebirge of the anticline-core, underlying these sediments of mudflow, grainflow and turbidity currents, was brought in syndepositorily by an Inter-Malmian gliding, was confirmed by the results of a drilling sunk for salt in the mentioned anticline (Fig.1). The drilling showed, that a sedimentary Klippe slid into the Malmian Oberalm beds, consists of Upper Permian Haselgebirge, Upper Triassic dolomite, dark Carnian shales and spotted Liassic marls, -rocks, which are known in the area of Hallstatt facies.

The components of Hallstatt facies in the clastic intercalations of the Oberalm beds and Roßfeld beds (Hauterivian) as well as the olistholiths of Hallstatt facies overriding these Roßfeld beds show, that during the Jurassic and Lower Cretaceous a submarine elevation was formed by salt-diapirism and caused the rhythmic sliding into the basin sediments (Fig.2). This diapirism might be related with Late-Kimmeridgian movements. Such movements are indicated by tilting of the southern marginal parts of the Osterhorn group and on the Göll massif. Besides the known transgression of Oberalm beds on the zone mentioned, E of Kuchl a silicious, limy Roßfeld sandstone unconformably overlying Oberalm beds was observed and a discordance between Oberalm beds and Schrambach marls on the Mehlweg road in the Berchtesgaden area.

The Tirolian Oberalm beds surrounding the Hallstatt facies zone of Hallein-Berchtesgaden are equivalent to Oberalm

beds containing Haselgebirge S St. Leonhard. As the components of the clastic intercalations (Haselgebirge, Malmian reef limestone ecc.) were moved to a certain degree also there, it seems possible, that the whole Hallstatt mass of the Hallein-Berchtesgaden zone was brought in by Intermalmian gravitational sliding too (Fig.3). A drilling in the Nesseltal anticline ("A" in the section of Fig.3) could easily clear the problem, whether this Hallstatt mass was brought into the Tirolicum like the Klippe S St.Leonhard by sliding or whether a Hallstatt facies belt within the Tirolicum caused elevation by salt diapirism. Independent of these two possibilities the Limestone Alps as a whole were thrust en block over Flysch and Helvetikum in the Lower Tertiary. At any case there are several facts, which tell in favour of a Malmian gliding mass.