AUER, M., GAWLICK, H.-J., SCHLAGINTWEIT, F. & SUZUKI, H. (2009): Spatial and temporal development of siliceous basin and shallow-water carbonate sedimentation in Oxfordian Northern Calcareous Alps. - Facies, **55**/1: 63-87, Erlangen.

GAWLICK, H.-J., SCHLAGINTWEIT, F. & SUZUKI, H. (2007): Die Ober-Jura bis Unter-Kreide Schichtfolge des Gebietes Sandling-Höherstein (Salzkammergut, Österreich) - Implikationen zur Rekonstruktion des Block-Puzzles der zentralen Nördlichen Kalkalpen, der Gliederung der karbonatklastischen Radiolarit-flyschbecken und der Entwicklung der Plassen-Karbonat-plattform. - Neues Jb. Geol. Paläont. Abh., **243**/1: 1-70, Stuttgart.

The Drei Brüder klippen structure - part of the major Trisselwand allochthonous unit (Salzkammergut/central Northern Calcareous Alps)

AUER, M.[1], SCHLAGINTWEIT, F.[2] & GAWLICK, H.-J.[1]

[1] University of Leoben, Department of Applied Geosciences and Geophysics, Prospection and Applied Sedimentology, Peter-Tunner-Strasse 5, 8700 Leoben, Austria;
[2] Lerchenauerstr. 167, 80935 München, Germany

The Drei Brüder Kogel mountain range north of Lake Grundlsee is situated in the eastern part of the Trisselwand massif (Fig. 1). The latter extends over an area of about 3 times 10 km, constituting the largest relic of the Plassen Carbonate Platform of the Northern Calcareous Alps. New investigations have shown that the bipartite structural build with a fault at the base of the Plassen Formation, known from the western carbonate massif (SCHÄFFER 1982, Geologische Bundesanstalt 2001), applies for the whole complex. In the east, however, this klippen-type geometry is found at higher altitude due to relative block uplift along a high-angle fault. In fact it is only preserved in the Drei Brüder structure with Plassen Formation on top of an Oberalm Formation + Barmstein Limestone succession. There is microfacial, biostratigraphical and structural evidence that these Late Jurassic to earliest Cretaceous carbonates do not form a primary depositional sequence but there was a post-depositional juxtaposition of the different Plassen Group formations.

The Drei Brüder Kogel constitutes the main summits of a N-S-oriented ridge on the eastern Trisselwand plateau. In contrast to the pelagic limestones of the Oberalm Formation with Barmstein Limestone carbonate breccia intercalations, forming the plateau, the Plassen Formation of the Drei Brüder Kogel mountain ridge is obviously more massive and less well bedded. The strata dip moderately towards north and are at an angle to the subhorizontal to shallowly dipping basinal strata underneath. Thin section analysis proved the hidden contact surface to be of secondary origin, at the same time excluding a simple sequence boundary hiatus with a prograding depositional system on top. The occurrence of *Kilianina*? *rahonensis* FOURY & VINCENT in the Drei Brüder Plassen Formation sequence indicates a Kimmeridgian age. In contrast, Late Tithonian calpionellids (*Crassicollaria*) were found in the footwall Oberalm Formation. Thus we clearly face an older-on-younger situation. The depositional setting of the Drei

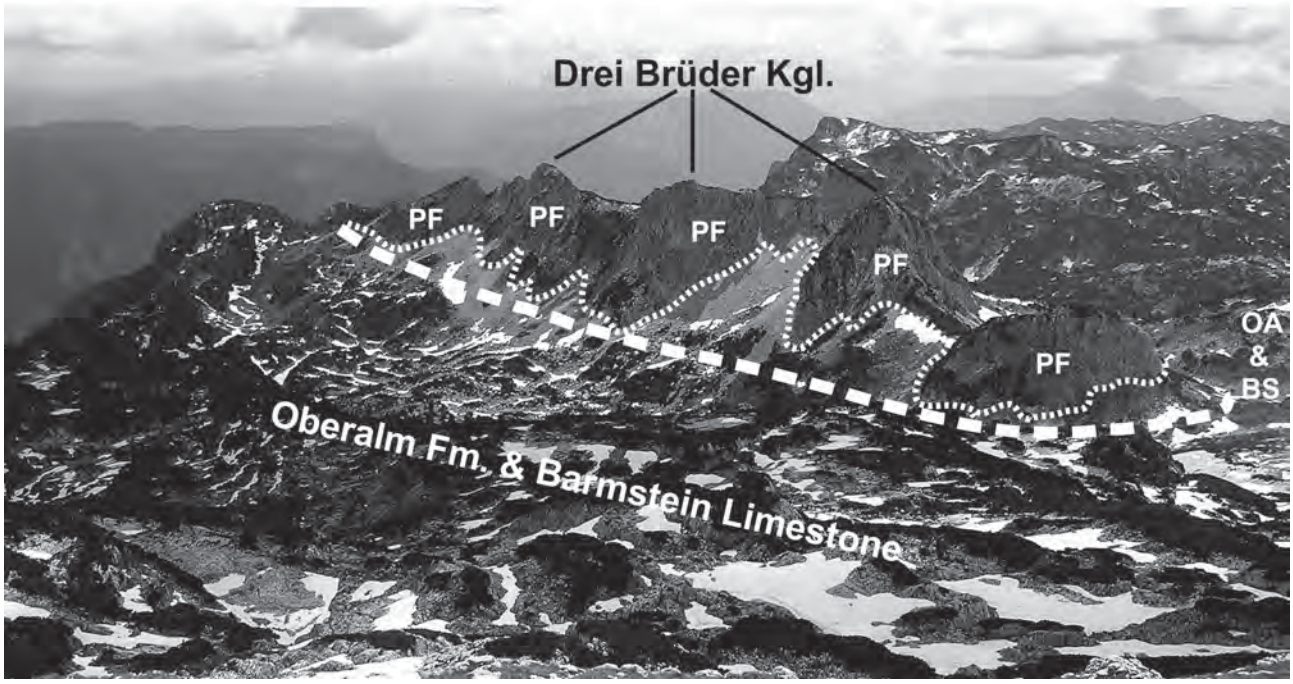

Fig. 1: View towards southwest on the Plassen Formation (PF) mountain ridge on top of the eastern Trisselwand plateau, with the Drei Brüder Kogel forming the main summits. The older stratigraphic age and the basal truncation of the beds clearly prove the allochthonous position of the Plassen Formation on top the Oberalm (OA) Formation + Barmstein (BS) Limestone sequence making up the eastern plateau. This general structural build applies for the complete Trisselwand Plassen Formation occurrence with the basal fault in topograpically lower position and locally older strata in the hangingwall in the central and western part of the massif.

Brüder Plassen Formation dominated by lagoonal sediments additionally precludes the possibility of a prograding platform sequence downlapping on basinal strata.
There are different options to explain the situation of the Drei Brüder Plassen Formation lid: mega-slide, thrust sheet or extensional allochthon. Considering the complete Trisselwand complex with the far better constrained klippen structure situation along the southern margin - yet unknown (SCHÄFFER 1982) occurrences of Early Jurassic to Oxfordian strata could locally be proven between the Oberalm Formation + Barmstein Limestone succession and the Plassen Formation - and the sheer size of the lid of approx. 30 km^2, the first possibility can be excluded.
A discrimination between an emplacement due to a reverse or a normal fault movement is difficult. The geometry with inclined strata truncated along a hangingwall ramp allows both interpretations. A normal movement, of course, would need a precursor thrust movement since older strata rest on younger ones. Pre-extensional nappe stacking was a prerequisite in this case. Nonetheless regional geometries to the south and occurrences of pre-Plassen Formation debris on the southern plateau are easier to explain with the two-phase extensional allochthon model. Normal faulting within the Northern Calcareous Alps is not digressive. Recently extensional tectonics have been Mount Rettenstein southwest of the Dachstein massif. There, substantial normal fault movement is well constrained by a significant upward jump in the thermal state across a fault (AUER et al. 2009, AUER & GAWLICK this volume).
Our investigations have shown that the complete Plassen Carbonate Platform occurrence of the Trisselwand massif is not in-situ but was secondarily transported to its current location. The Drei Brüder klippen structure is part this Trisselwand allochthonous tectonic unit, nicely showing its structural build en miniature and in three dimensions. The finding of the transported origin of the Trisselwand Plassen Carbonate Platform rocks adds up to a number of similar conclusions for other Plassen Formation occurrences within the Upper Tirolic unit. It constitutes an important step for a better understanding of the Late Jurassic palaeogeography, helping to solve fundamental facial-geometrical problems in the present-day distribution of the Plassen Carbonate Platform related sedimentary rocks.

AUER, M., GAWLICK, H.-J., SCHLAGINTWEIT, F. & SUZUKI, H. (2009): Spatial and temporal development of siliceous basin and shallow-water carbonate sedimentation in Oxfordian Northern Calcareous Alps. - Facies, **55**/1: 63-87, Erlangen.

GEOLOGISCHE BUNDESANSTALT (2001): Provisorische Geologische Karte der Republik Österreich 1:50.000, Blatt 97 Bad Mitterndorf. - Geofast, Geologische Bundesanstalt, Wien.

SCHÄFFER, G. (1982): Geologische Karte der Republik Österreich 1 : 50.000, Blatt 96 Bad Ischl. - Geologische Bundesanstalt, Wien.

Der Kokardendolomit in der Spatmagnesitlagerstätte Hohentauern/Sunk (Grauwackenzone/Österreich)

AZIMZADEH, A.M. & EBNER, F.

University of Leoben, Department of Applied Geosciences and Geophysics, Peter-Tunner-Strasse 5, 8700 Leoben, Austria

In der Spatmagnesitlagerstätte Hohentauern/Sunk in der Veitscher Decke der steirischen Grauwackenzone treten Kokarden-(Kugel-)dolomite (KD) in einer Bank des ehemaligen Tagbaues auf der orographisch rechten Bachseite im Bereich der Etagen XIV bis XI auf.
Namengebend sind überwiegend im Hangenden der Bank auftretende, mm bis dm-große, hell anwitternde, kugelige bis länglich-ovale Dolomitaggregate (Kokarden), die in einer dunkelgrauen, feinkörnigen Dolomitmatrix eingebettet sind. Sie zeigen konzentrischen, lagenförmigen Aufbau aus radialstrahlig oder spätig strukturierten Dolomitkristallen, die unregelmäßig geformte, eckige Kerne aus dunklem mikritischen Dolomit oder Spatmagnesit umgeben (Abb. 1, 2). Im Liegenden der Bank sind in den dicht gepackten Kokarden relativ große, eckige Magnesitkerne eingeschlossen. Die im Hangenden regellos auftretenden Kokarden haben nur vereinzelte, geringer dimensionierte Magnesit-Fragmente als Kerne. Gute Aufschlüsse befinden sich im Abbaubereich der ehemaligen Hangendbank auf Etage XI, wo die z. T. schichtparallel im Pinolitmagnesit eingelagerte KD-Bank eine Mächtigkeit von 1 m erreicht. Nach N abwärts in Richtung Etage XIV verliert sie sich.
Die KD wurden seit der Ersterwähnung und Deutung als Brekzien (REDLICH 1935) mehrfach als schichtparallele, synsedimentäre oolithische Bildungen um aufgearbeitete Dolomitmikrite und Spatmagnesite (HADITSCH 1968, SIEGEL & FELSER 1973) bzw. als synsedimentär-frühdiagenetische Bildungen in einem feinstkörnigen Dolomitsediment angesehen (KRALIK & KIESL 1992). Entsprechend diesen Interpretationen implizieren die Spatmagnesitkerne eine syn- bis frühdiagenetische Bildung des Spatmagesits. Post-sedimentäre Sm/Nd-Bildungsalter des Spatmagnesits (268-325 Ma; AZIM-ZADEH et al. 2009) widerlegen eine synsedimentäre Bildung der KD.

Abb. 1: Einlagerung von Kugeldolomit im Magnesit.