

Young faults inside and east of the Rhine Valley tending to the northern foreland are demonstrated using new geological maps of Vorarlberg in preparation (1 : 100 000 and 1 : 200 000)

Oberhauser, R.

Marxergasse 36 / 2 / 6 / 30, 1030 - Wien, Austria

We consider the fault crossing the "Luzensteig" from south to north towards Liechtenstein to be a prolongation of the "Churer Lineament". Supporting the elevation of the western Alps it brings in a side by side position Upper Jurassic rocks of the Penninic Falknis nappe against Lower Cretaceous ones of the Helvetic Säntis nappe and cuts off the connection between the Prätigau- and the Triesenflysch.

The main prolongation of the „Churer Linament“ to the Lake of Constance is covered by post-glacial sediments. As we see in the west of Sevelen, another one towards the "Sax – Schwendi Bruch" is also possible.

This well studied fault structure is crossing the Säntis massif. The fault structure demonstrates synergising of faulting with folding. The western part was elevated and moving it to the left. But it is not crossing today's boundary of the Subalpine Molasse. This means that it ends in a southern part of it which later in Miocene time was covered by the prograding alpine edifice.

Towards the Lake of Constance inside the valley the "Kummen" mountain demonstrates past activities in prolongating the "Churer Lineament" northwards. Here, close to the axis of the Rhine valley depression of the northern Säntis nappe, the NNW looking frontal part of a prolongation of the down-sinking "Götzis fold" is elevated for several hundred meters.

Partly visible in excellent outcrops when entering and leaving the rocky mountain slope, the "Emsrütti fault" separates the higher mountains from the "Hohenems fold" (or nappe) for a distance of 4,5 km from Hohenems to Dornbirn. Causing in part a straight furrow in the landscape, the "Emsrütti Fault" is also visible from higher up on the slope.

The elevated "Hohenems fold" (or nappe) is dominated by steep rocks towards the Rhine Valley. Its inverted sequence from Seewerkalk to Schratenkalk is quarried at the "Rhombberg Steinbruch". It was not the "Emsrütti" region and the slope behind, dominated by Eocene beds with Nummulites and the block of the "Breite Berg", which was lifted up.

It was the "Hohenems fold" in front of it, dominated by inverted sequences. It was elevated for several hundred meters, like before the frontal part of the "Kummen" mountain !

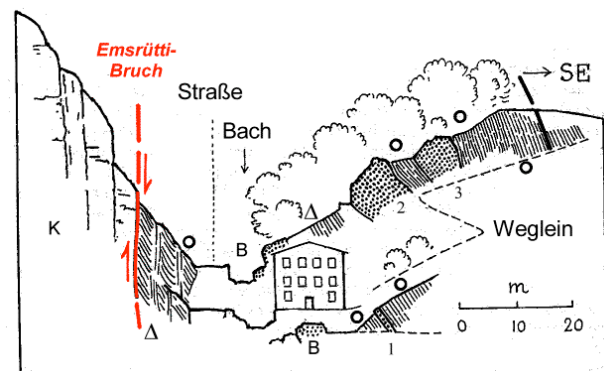


Figure 1: Der beginnende Straßenanstieg nach Emsrütti mit dem die Eozänschuppen gegenüber der Falte von Hohenems absetzenden Emsrütti Bruch. K = Kieselkalk + Drusbergsschichten + Schratenkalk + „Gault“ + Seewerkalk (zerlegt), A = Amdener Schichten, O = Globigerinenmergel des Mitteleozän, 1, 2, 3 = glaukonitische Nummulitenkalke, z. T. mit Roterz, B = Blöcke davon, (nach einer nachgelassenen Skizze von Arnold HEIM).

See the drawing of Arnold HEIM from before 80 years (from OBERHAUSER 2005, p. 132).

This also took place after a very complicated folding of the frontal parts of the "Säntis nappe" and probably after the folding of the Subalpine Molasse. Therefore we try to insert the prolongation of the "Emsrütli Bruch" beneath the young sediments of the Rhine-valley in-between the Subalpine- and the Foreland Molasse, acting in uppermost Miocene to Pliocene time.

The left-side moving „Ostergunten Störung“ cutting off the Quintner Kalk of the Canisfluh to the east, works like the "Sax – Schwendi Bruch" and therefore it does not enter the Subalpine Molasse in the situation of today.

The also left-side moving "Gargellen Störung" crosses the Prätigau flysch, the Silvretta-Kristallin and parts of the Northern Calcareous Alps until it reaches the Lech Valley near the village of Lech. It looks like being not irritated by strike slip movements inside Montafon- and Klostertal valleys.

It is difficult to connect it with the important fault structures inside the Iller Valley, in part crossing the Molasse boundary. Here we encounter the western end of a northernmost part of the Northern Calcareous Alps. Their former western prolongation was eroded after its elevation, which was supported by this fault system.

REFERENCES

- OBERHAUSER, R.: Blatt 110 St. Gallen Süd und 111 Dornbirn Süd der Geologischen Karte der Republik Österreich 1 : 25 000, Wien 1982, Erläuterungen hiezu mit Beiträgen von I. DRAXLER (Pollenanalyse), W. KRIEG (Höhlen) und W. RESCH (Flußspat): 72 S., 13 Abb., 2 Tab., 4 Tafeln - Geol. B. A., Wien 1991.
- OBERHAUSER, R. mit Beiträgen von R. HANTKE, P. HERRMANN, H. LOACKER und W. RESCH : Blatt 110 St. Gallen Nord und 111 Dornbirn Nord der Geologischen Karte 1 : 25 000 der Republik Österreich. - Geol. B. A., Wien 1994.
- OBERHAUSER, R., RATAJ, W., : Geologisch –Tektonische Übersichtskarte von Vorarlberg 1 : 200 000, mit Erläuterungen von R. OBERHAUSER, 42 Seiten, 4 Falttafeln - Geologische Bundesanstalt und Vorarlberger Landesmuseumsverein, Wien 1998.
- OBERHAUSER, R. : Zur Geologie der Staufenspitz-Gruppe südlich Dornbirn. – Forschen und Entdecken **16**, S. 109 – 152, 20 Abb., Inatura Dornbirn 2005.