

## Section 9

### **The Spießnägel Section in the Graywacke Zone of Tyrol** (figs. 24, 25)

by Hans Peter Schönlaub

As far as general geology and stratigraphy of this part of the Graywacke Zone are concerned we refer to the introductory paper by H.P.SCHÖNLAUB & H. HEINISCH in this volume.

According to H. MOSTLER and his working team who have studied the Tyrolean part of the Graywacke Zone in great detail during the past 30 years, the area south of the line from Kitzbühel to Kirchberg und Brixen is dominated by an Ordovician shale sequence with intercalations of volcanoclastics (see fig. 24). In the Upper Ordovician they are followed by acid volcanics, the so-called Blasseneck Porphyroid. Although there are no data available concerning the precise position of the Ordovician/Silurian boundary in that area, the Silurian succession is fairly well known due to conodont occurrences and some other fossils such as graptolites.



Fig. 24: General geology of the Graywacke Zone southwest of Kitzbühel, Tyrol (Black: Porphyroids; dashed: Silurian carbonates; dotted: Triassic; white: Wildschönau Formation with greenschist intercalations). After AL-HASSANI & MOSTLER 1969.

The section at the southern peak of the Spießnägel mountain is one of the most important successions in which a detailed transition from graywackes of presumably latest Ordovician age to basal Silurian strata has been documented (N. AL HASANI & H. MOSTLER 1969; fig. 25). The Silurian sequence starts with a 0.85 m thick bed of arenaceous and tuffitic limestones of the *P. celloni* Zone. Within this bed a 6 cm thick tuffitic interbed occurs which is followed by well bedded brownish bioturbated and crinoidal limestones. To a varying degree these limestones are mineralized. The lower 0.65 cm portion of these limestones are bioturbated mudstones with varying amount of clastic and tuffaceous input. Starting with sample no. 75 some 0.70 m above the base of the limestone section fossil debris becomes significantly enriched forming wackestones. Of special interest is the occurrence of superficial ooids which can be found in the upper part of this bed. According to the authors these ooids consist of a crinoid nucleus or shell debris of bivalves which were superficially coated.

The basal part is succeeded by 1.10 m of brownish well bedded to noduliferous limestones with up to 0.25 thick shaly layers containing some limestone lenses. This part represents packstones with lumachelles-like debris of bivalves, brachiopods, ostracods and in particular echinoderms in the upper portion. Fairly abruptly, this sequence grades into greyish and yellowish laminated dolomitic rocks.

The limestone sequence below the dolomites correspond to the interval from the the *P. celloni* to the *P. amorphognathoides* Zone. Hence, they reflect the environment of the Upper Llandovery and the transition to the Wenlock. According to H. MOSTLER the base of the overlying dolomites represent the *K. patula* Zone of the early Wenlock.

Fig. 25: The Spießnägel Section after AL HASANI & MOSTLER (1969); a: Subgraywackes of Wildschönau Formation; b: Limestone with tuffaceous layers; c: Grainstone with coated grains; d: Bioclastic grainstone; e: Well sorted echinodermal limestone; f: laminated dolomite

