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Deformation of Createaceous Complex in the Eastern Part of the Intra-Sudetic Basin and Nysa Graben (SW Poland) – a Geological Map Analysis

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Cretaceous complex in eastern part of the Intra-Sudetic Basin and Nysa Graben (SW Poland) is dominantly composed of sandstones and calcareous mudstones and claystones, interpreted as a littoral-to-shelf succession which formed between the Upper Cenomanian and Santonian (Wojewoda, 1997). Its present thickness varies from about 350 m in the Góry Stołowe Mts. area up to 1200 m in the Nysa Trough. The thickness variation of the complex is due to differences in paleotopography of the Cretaceous basin and its variable capability of sediment accommodation in different parts, as well as to subsequent tectonic deformation and erosion. As a result of the latter, the complex is locally discontinuous, cut by faults and locally rotated up to vertical position or even overturned (Don B. and Don J., 1960, Don J., 1996). In the area studied, Cretaceous deposits overlie both crystalline and older sedimentary rocks.

Based on information on the strike and dip of Cretaceous beds displayed on the detailed geological maps of the Sudetes at the scale of 1:25,000, the orientation of beds was analysed and its dependence on basement type and depicted tectonic structures was studied. The interpolation of dip values allowed to plotting isolines of equal inclination of beds. The accuracy of this interpolation depended upon the amount and correctness of the bed orientation measurements, therefore it varies between the map sheets.

The Cretaceous complex is dominantly flat-lying, dipping at the angle of 0–15 . Only in a few localities anticlinal or synclinal structures of a broad width and small height are remarkable. Beds steepen significantly, up to vertical or overturned position, at most of mapped contacts with exposed crystalline basement, suggesting fault boundaries with the latter and the steepening being due to fault drag. This is also supported by a remarkable congruence of high angle isolines with strikes of major faults plotted on the maps and a higher inclination of beds in the vicinity of those faults. The trends of high angle isolines may, thus, indicate the position of fault zones within and around the Cretaceous complex. In places where the complex borders (on the ground surface) on older sedimentary complexes, no bed steepening is observed.

Most of the steeply inclined areas of the analysed structural unit corresponds to the occurrences of fine-grained sediments, i.e., calcareous mudstones and claystones. Sandstone bodies lie generally flat – in places even close to fault boundaries of the complex. This may imply that during tectonic deformation coarse-grained sediments responded in a more brittle way in comparison to fine-grained ones. Besides the fault zones, the deposits remain flat both on the crystalline and sedimentary rock basement. This suggests that the Cretaceous complex has been displaced vertically together with the individual fault-separated blocks of the basement at different heights and, as a result, it was eroded at different structural levels. The latter is confirmed by varying isoline values at the mapped boundaries between the complex and its basement.

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AMS and Deformation Patterns in The Jawornickie Granitoids, Rychlebske Hory – Preliminary Data

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During the last two decades, a number of studies has shown that the magnetic properties of rocks, especially anisotropy of magnetic susceptibility (AMS), can be used as a tool for grain fabric characteristic (Richter et al., 1993), as a strain indicator (Borra-