

The Wenlock/Ludlow Boundary Based on Biostratigraphical and Geophysical Data of Poland

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Silurian deposits in Poland of the graptolite facies are some of the best developed in the world which has long entitled the authors to express their opinions on stratigraphy and further more to define the boundaries of stages.

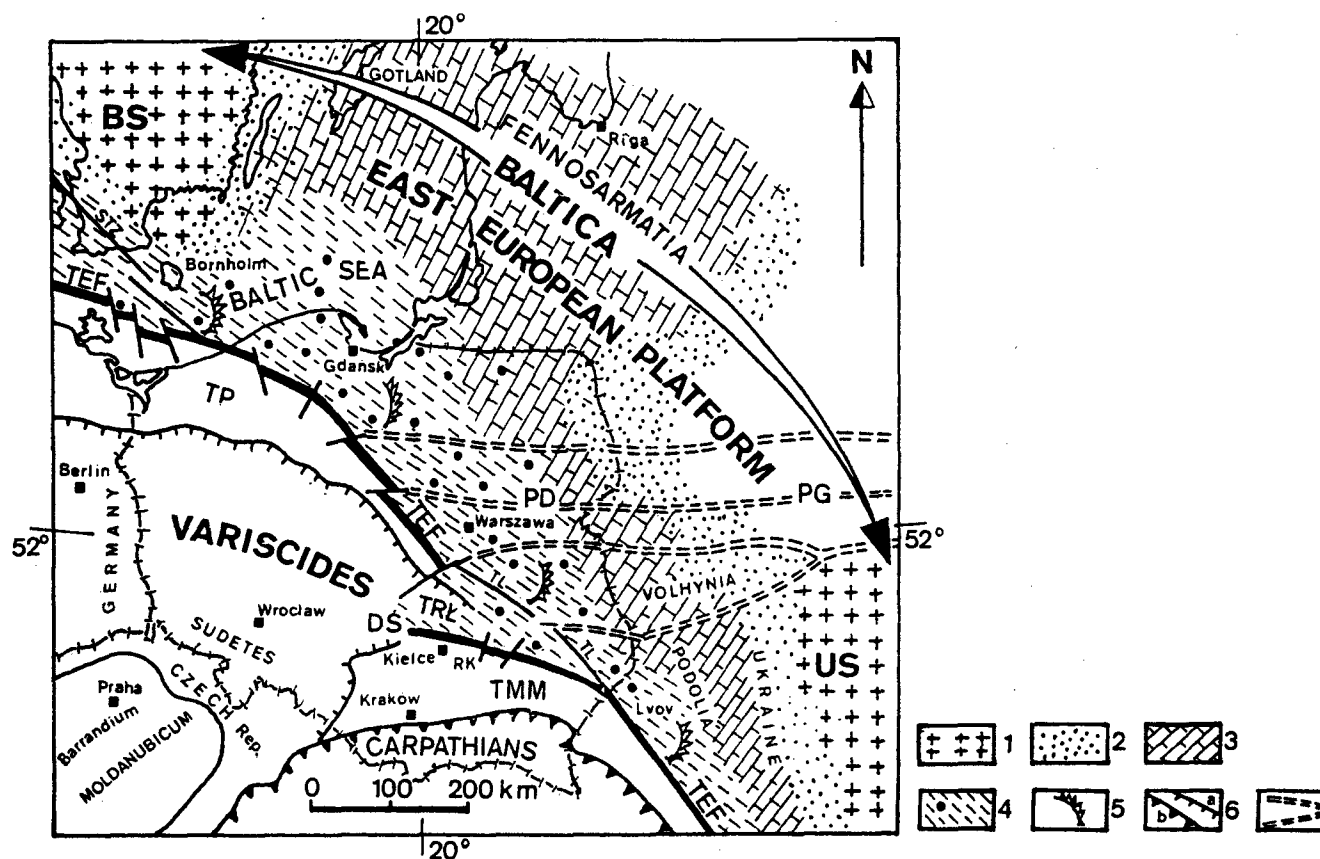


Fig. 1: The tectonic scheme and geological map of Silurian sediments of the Poland. 1: crystalline basement; 2: shelf deposits mainly terrigenous; 3: shelf deposits mainly carbonate; 4/5: clay deposits of graptolite sea or deeper continental slope with locations of the main boreholes; 6a: Front of the Variscides; 6b: Front of the Alpides; 7: Dip-slip fault and strike-slip zones of Bretonian phase movements. BS: Baltic shield; US: Ukrainian shield; TEF: Trans-European Faultbordered the East European Platform from the South-West; TL: Teisseyre Line; STZ: Sorgenfrei-Tornquist Zone; PD: Podlasie Depression; PG: Prypets Graben; TP: Pomeranian terrane; TRL: Lysa Góra Region terrane; DS: Swietokrzyska Holy Cross dislocation; TMM: Malopolska Massif terrane including RK: Kielce Region.

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The boundary between the Wenlock and the Ludlow at the base of *nilssoni* Zone which has recently been launched by the British geologists, is not commonly accepted. This boundary should be retained according to the criteria worked out by the outstanding British researchers G. Elles and E. Wood (1901-1918), namely between *Cyrtograptus lundgreni* and *Monograptus vulgaris* Zones (sensu lato).

Detailed studies of the *lundgreni* graptolite assemblage made possible the inclusion of *testis* Zone only in the Wenlock (Tomczyk, 1956-91). Towards to the end of its range the majority of graptolites mainly Wenlockian in age have disappeared, bringing their stage of development to the end *Testograptus*, *Cyrtograptus*, *Monoclimacis*; *flexilis* and *flemingi* groups and others. These facts were also noticed by Jaeger (1959, 1976) who distinguished the interval of claystones above the top of *Cyrtograptus lundgreni* Zone called "*nassa-dubius interregnum*" to which the author has also lately attributed the term "big crisis" (Jaeger 1991).

The Polish Silurian profiles entirely confirm this opinion, which was many times stressed and supported by the authors (Tomczyk 1970; Tomczykowa 1988, Tomczykowa and Tomczyk 1979 a,b). The big crisis of the organic world which happened at the boundary between the Wenlock and the Ludlow was marked by the decline of graptolites and by the occurrence of new taxons of benthic fauna (*Gothograptus*, *Spinograptus*, *Plectograptus*, *Holoretiolites* and *Neoretiolites* and others as well as trilobites and brachiopods).

This phenomenon is observed in very numerous core profiles along the Fennosarmatia (Baltica) shelf over a distance of about 1000 km (Fig. 1) mainly in Poland: south-east from Bornholm up till the Lvov Basin in the western part of Ukraine (Pozaryski and Tomczyk, 1968, 1993). The Silurian profiles of this area based on the graptolite fauna shed light on the stratigraphy of the classical Silurian of the shallower carbonate shelf on the Gotland Island, in the Baltic countries, in Volhynia and Podolia and also in the Holy Cross Mts., mainly Lysa Góra Region (Fig. 1). The changes which had taken place at that time are emphasized by the distinct anomalies in the geophysical measurements *gamma* and *neutron gamma* in the logging records ranging from 4 to 10 - 14 m occurring in the *G. nassa* Zone which is dominant within the argillo-marls deposits constituting the base of the Ludlow (Tomczyk 1956, 1970, 1991; Tomczykowa and Tomczyk 1979a,b). The term of the big crisis sensu H. Jaeger (1991) has connection with the global bioevents.