phosed Upper Frasnian(?) and Famennian limestones, they must have formed prior to the Upper Devonian. Here a brief description and a preliminary kinematic interpretation of the mylonites are given.

The Kłodzko Metamorphic Unit represents a relatively small outcrop zone of the crystalline basement which occurs between the Góry Sowie massif and the Orlica–Śnieżnik dome. It is mostly surrounded by Upper Carboniferous to Permian deposits of the Intra-Sudetic Basin. Towards the east, it displays an intrusive contact against the Variscan Kłodzko–Złoty Stok granitoids. Eroded metamorphic rocks of the unit are unconformably covered in the NE by Upper Devonian strata which form the base of the Bardo succession.

The Kłodzko Unit consists of six smaller tectonic elements of different provenance and history, juxtaposed by thrusting and later ductile strike-slip faulting. The SW part of the unit comprises mostly meta-igneous rocks, whereas the NE part is composed of sedimentary and volcano-sedimentary successions. Metagabbros and associated gneisses and metarhyolitoids are exposed in the central SW part of the Kłodzko Unit, between the Orlica Hill and Gołogłowy. These rocks are accompanied by mylonites which are previously mapped as phyllites and hornblende schists (Fischer and Meister 1938; Wójcik and Gaździk 1958). A continuous transition from the metagabbros to mylonites are best exposed in an abandoned quarry on the NE slope of the Orlina Hill and in the valley SW of there. Massive, almost structureless metagabbros grade into mylonites at a distance of a few metres. This transition is associated with a rapid decrease in grain size and the development of intense foliation. Original plagioclase crystals are entirely transformed into an aggregate of albite, epidote and/or zoizite with subordinate prehnite. Hornblende, the main component of the metagabbro, is partly replaced by chloritized biotite, chlorite and fine needles of amphibole, and partly survived as large broken porphyroclasts. The metagabbros were equilibrated under peak metamorphism amphibolite-facies conditions, probably related to a thrusting event. The mylonitization was associated with significant retrogression and occurred under greenschist-facies conditions, indicated by the syn-kinematic growth of chlorite.

The Kłodzko Unit is generally characterized by WNW–ESE lineations and steep to vertical foliations. The mylonitic foliation and lineation are roughly parallel to the foliation and lineation produced by the earlier thrusting event. In several cases, at a scale of individual exposures and samples, the two sets of foliations and lineations display cross-cutting relationships. Furthermore, the mylonitic lineation locally overprints the older foliation, being obliquely superimposed on the earlier lineation. Kinematic indicators in the mylonites consistently show a dextral sense of shear. These are S-C structures, extensional shear bands and asymmetric pressure shadows. Lineation plunging ESE at low or medium angles is mostly related to a dextral strike-slip displacement along steep, S-dipping foliation. There is, however, a considerable top-to-WNW up-dip displacement component which suggests a general transpressive regime. The mylonite zone attains a thickness of up to few hundred metres, which seems to indicate a large magnitude of the displacement.

In the vicinity of Kłodzko, the age of the dextral transpressive event is constrained by the presence of pre-Upper Devonian angular unconformity. The lower time limit for the mylonitization is provided by the early Givetian age of fauna from the crystalline limestone in the NE part of the Kłodzko Unit (Hladil et al. 1999). Consequently, the timing of the dextral transpressive event seems to be restricted to the early Givetian – late Frasnian interval. The mylonitization was probably related to the displacement along the neighbouring Intra-Sudetic Fault interpreted by Aleksandrowski (1995) as a major dextral strike-slip zone. This would mean that the activity of that fault began as early as in Middle/Late Devonian times.

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Complex Investigation of Paleozoic Rocks from Stínava–Repešský žleb Locality (Drahany Upland, Central Moravia, Czech Republic)

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The Drahany Upland (a part of the Rhenohercynian belt of the Central European Variscides) is mostly composed of the Lower Carboniferous flysch formations (graywackes, shales, and conglomerates) with some incorporated bodies of Lower Paleozoic pre-flysch rocks (Silurian shales and carbonates, Devonian basalts, shales, carbonates and iron ores). The area with outcrops

of Devonian and Silurian rocks is called the Repechy Belt, and the famous locality is Stínava.

Black graptolitic shales and dark carbonates from the Stínava site contain tectonically deformed but still determinable Silurian macrofossils (graptolites, cephalopods, mollusks, ostracods and crinoids). A revision of graptolites and cephalopods has confirmed the presence of at least two Silurian stratigraphical levels at the locality of Stínava. The older one is associated with the upper Llandoverian – lower Wenlockian interval (spiralis Zone is clearly present, interval of griestonensis–crenulata to centrifugus–murchisoni zones is possibly present) and the younger one with the lower Ludlovian (nilssoni Zone is clearly present, interval up to the lower part of leintwardinensis is possibly present).

Samples representing the most common lithology of Silurian rocks were studied with the aim of finding organic-walled microfossils (OWM, such as spores and cryptospores, the Acritarcha group, Mazuelloida group and/or chitinozoans). No determinable OWM were found in slides (prepared by usual palynological methods). Tectonically deformed specimens of chitinozoans were observed in oriented thin sections prepared from non-calcareous black graptolite shale; taxonomical classification on species or genus levels is not possible because of the poor preservation of all observed specimens.

Gamma-ray activity of the Silurian (and Devonian) rocks was studied. Comparison between radioactivity (laboratory gamma-ray spectrometry analysis) of rocks from the Stínava locality and Barrandian Silurian rocks shows different contents of radioactive elements. Lower content of Ra and high Th/Ra ratio at Stínava can be explained by different sources.

The Devonian volcano-sedimentary ore mineralization (Lahn–Dill) contains an unusual ore association, with prevailing chlorite–siderite ores and low content of magnetite ores in deeper parts of the ore lens. The ore body was strongly affected by quartz metasomatism in the chlorite facies, causing siderite chloritization and silicification of the whole ore body. An unusual specimen of an oolitic phosphate from this locality was also described. The Stínava iron-ore deposit was exploited in several separate historical stages. The main period of mining in the 16th century is very well documented (written documentation, dated tools and dendrochronological datum – 1551).

Geophysical field research shows a very complicated tectonic pattern at the locality.

Based on structural data, the fold tectonics of the whole area seems to be subcylindrical. The pre-flysch sequence is situated in the axial depression(!) of the assumed large structure. Tectonics of the pre-flysch rocks was studied at three outcrops in deep valleys. It was found that the pre-flysch formation is, contrary to the previous views, situated in the core of a syncline or in the outer part of the Culm anticline. These settings correspond to the various parts of the folded thrust plane along which the pre-flysch sequence was thrust over the flysch complex. Devonian rocks form small tectonic sheets along the folded thrust plane.

General Remarks on Variscan Tectonics in the Sudetes Mts. and their Foreland

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In the last years, the Sudetic geology is under fire especially created by those investigators who deal mainly with geochemical analyses, problematic existence of subduction zones, the meaning of kinematic indicators and so on. Such activities bring a lot of new information and are fashionable; however, sombody may get an impression that the geology of the end of the 20th century rests in geochemistry.

Fortunately, a wealth of data from classical geology have been published till now. After some release of these data, a change of our understanding of the Variscan scenario of tectonic events in the Sudetes and its neighborhood is obvious. I would like to stress only some points.

In the Sudetes Mts. and also in larger areas of southern Poland, an existence of divergent imbrication structure is evident. This structure has its suture in the Niemcza Zone (Pin et al.1988 expressed another opinion that the Nowa Ruda ophiolite and Ślęża ophiolite are remnants of a suture between Saxothuringian and Moldanubian zones) with ophiolite bodies. To the east, this imbrication of large-scale geological units also involves the Upper Silesian Coal Basin with its basement inclined to the west. Similarly, the Devonian cover rocks of Małopolska Massif exhibit higher thickness in the western part than the eastern one. The imbrication structure in the Sudetes proper was descriebed and published years ago in Geologia Sudetica (Mierzejewski 1993) and therefore will not be portrayed here once again.

The imbrication process, which started in the Upper Devonian and proceeded till the Carboniferous, leads to large-scale horizontal and vertical movements It was the reason for rapid erosion of Sudetic blocks and for the formation of thick succession of Lower Carboniferous continental clastic cyclothems inside the Sudetes in Intra-Sudetic Basin. These cyclothems were extremely well described by Andrzej Teisseyre (1975). In the Sudetes proper, the Lower Carboniferous deposits were folded only in those units (Kaczawa Mts. – Haydukiewicz, pers. comm., and Bardo Mts. – Wajsprych 1986), which are suspected to be of allochtonous nature. An extended beld of Lower Carboniferous marine flyschoid deposits, situated outside the Sudetes and outside the Fore-Sudetic Block is also treated as the result of these vertical movement. This belt is an extension of the Rhenohercynian Zone in Germany.

It should be mentioned that the Niemcza suture zone (with remains of oceanic crust) of that great imbrication edifice, is situated within the Saxothuringian Zone, and not at the border between ST and RH zones. Therefore, one can imagine, that during the first stage of the Wilson cycle, an old continental crust was divided into different blocks with oceanic crust in between. Then, after inversion of convection currents during