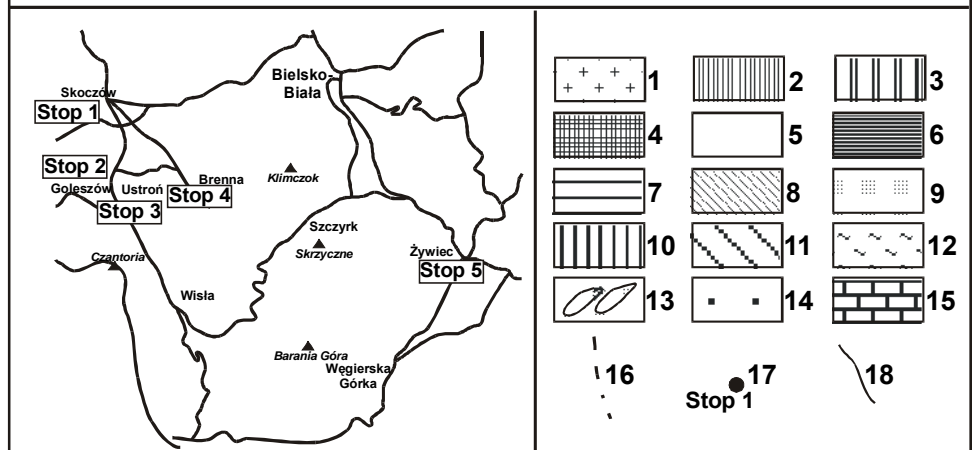
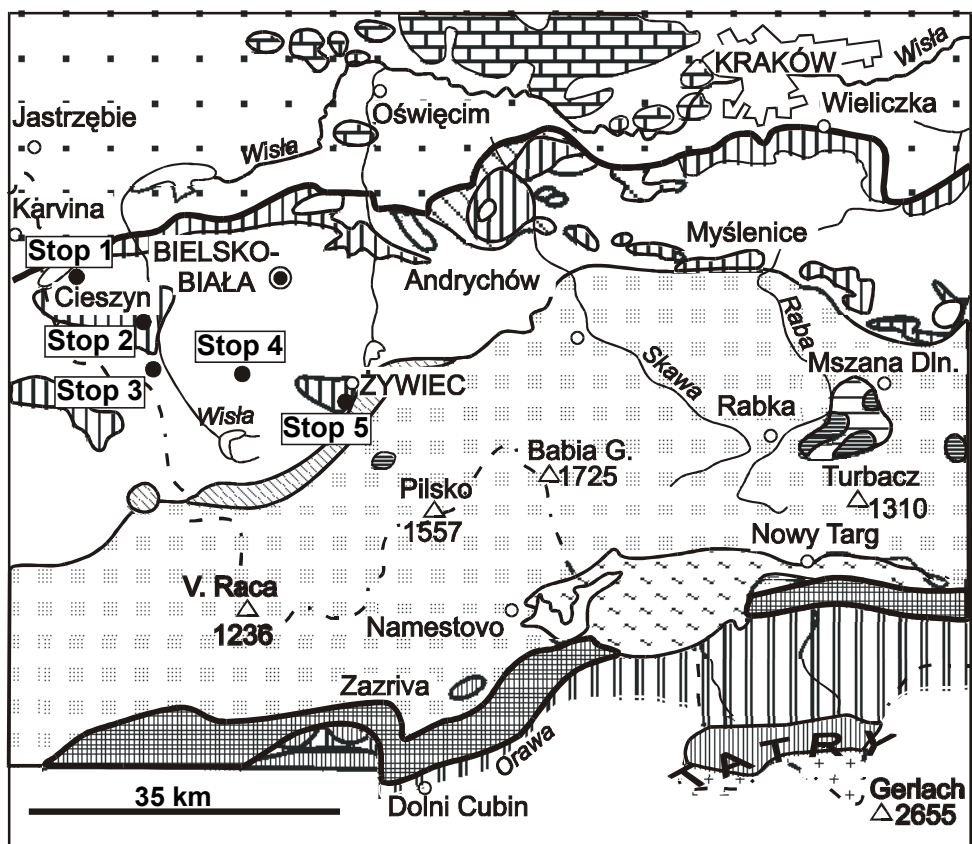


Location of the stops.

A. Geological map of western part of the Polish Carpathians. Inner Carpathians: 1 - cristaline massif of Tatra Mts., 2 - sedimentary cover (autochthonous deposits, Tatric and Sub-Tatric nappes), 3 – Central Carpathian Paleogene (Podhale Flysch). Outrer Carpathians: 4 – Pieniny Klippen Belt, 5 - Silesian Nappe, 6 – Grybów Nappe, 7 – Dukla Nappe, Fore-Magura Unit, 9 – Magura Nappe, 10 – Subsilesian Nappe, 11 – Skole Nappe. Miocene deposits on the flysch units: 12 – fresh-water deposits of the Orawa-Nowy Targ Basin, 13 – marine deposits. Carpathian Foreland: 14 – marine Miocene deposits of the Carpathian Foredeep, 15 – North European Platform. 16 – Thrusts: a – of the Carpathian domain, b – of nappes, c – of thrust-sheets. 17 - State frontiers. 18 - Location of stops.

B. Location map of the field trip area: 18 - location of stops, 19 – main roads.



STOP 1

ROMAN WŁODYKA

Location: Rudów (Zamarski) near Cieszyn

Tectonic unit: Silesian Nappe

Formation: Cieszyn Beds: Upper Cieszyn Shales

Age: Late Valanginian

In the Polish Western Carpathians outcrops of the volcanic bodies are scarce; the most common rock type in this region termed as teschenite will be presented in Rudów village, north of Cieszyn. The massive central parts of the Rudów sill can be observed in the small, abandon quarry while in the Piotrkówka stream section the upper margin and contact between sill and sediments are also visible. The top 0.2-0.3 m of this sill is chilled teschenite, containing numerous microphenocrysts of clinopyroxene and olivine (largely pseudomorphed) with a morphology suggesting rapid growth from the melt. Relatively large patches of analcite, zeolites, albite, adularia, and calcite are present. The fine-grained matrix consists mainly of kaersutite, biotite, Ti-magnetite and pyroxene microlites with subordinate amount of feldspars replaced by albite and adularia. The small, elongated phenocrysts of Ti-augite show well-developed hour-glass structure with the signs of their amphibolization. The upper sill grades from the very fine chilled margin through fine-grained mafic (augite) teschenite to the typical medium-grained teschenite over about 2-3 m, which is formed of elongate plagioclase laths sub-ophitically intergrown with purplish red in colour and sector-zoned titanaugites. Amphibole is a relative common phase, it occur as single crystals or epitaxial overgrowths on clinopyroxene. The amphibolization of pyroxene is frequently find; it starts from the margins and sometimes the whole of the grains is amphibolitized. This type of teschenite rock is mainly exposed in the closed quarry. With a very gradual increase in grainsize, the variations of proportion between felsic mesostasis (plagioclase, alkali feldspars and nepheline) and mafic phases (clinopyroxene and amphibole) are observed. In mafic teschenite the amount of pyroxene and amphibole is maximum. In syenoteschenite the felsic phases dominates over the mafic ones (see Table 1). This type of rock often forms pegmatitic horizons which alternate with medium-grained teschenites in the central parts of the sill presented. The syenites, which can occur as small irregular bodies with sharp boundary in the upper unit of the sill or as veins cross-cutting the upper or lower chilled margins are absent in these outcrops.

Table 1. Modal mineral variations in the Rudów sill; 1- mafic teschenite, 2, 3- teschenite, 4- syenoteschenite, 5- syenite

	1		2		3		4		5	
Pyroxene	35.9	74.6	41.8	60.7	45.6	50.0	17.8	43.6	10.1	13.0
Amphibole	32.0		8.9		3.6		22.7		2.0	
Biotite	1.1		1.3		0.2		0.4		0.8	
Ti-magnetite	5.6		8.7		0.6		2.7		0.1	
Feldspar	4.9	24.6	3.5	37.9	20.9	49.7	14.7	55.2	30.8	85.7
Zeolite	19.6		34.4		28.8		38.8		51.7	
Nepheline							1.7		3.2	
Titanite			0.3							
Apatite	0.9		0.9		0.4		1.2			
Calcite									1.3	

The pyroxenes belong to the most abundant minerals (up to 70 vol. %) in all rock types of the teschenite sill. They vary from microlites (< 0.35 mm) in chilled margins to prismatic euhedral crystals about 1.5 mm across and 5 mm long in teschenite and syenoteschenite. Generally, the clinopyroxene from teschenite and syenoteschenite are subsilicic diopsides while the clinopyroxene from syenite has a composition of hedenbergite. Some of the syenoteschenite pyroxenes show complex zoning, core is diopside in compositions while the outer reactionary rims are hedenbergite. Amphiboles vary in modal abundance from 2 % (syenite) to 30 vol. % (mafic teschenite). They change from microlites (< 0.3 mm, chilled margins) to prismatic, euhedral crystals (up to 6 mm, teschenite and syenoteschenite) and needle-like crystals (up to 10 mm, syenite). The amphibole range in composition from kaersutite (teschenite) to ferro-kaersutite (syenite). The later, reactionary green rims with hastingsite compositions, occurring through the whole vertical section of the Rudów sill were probably originated during reaction with the latest residuals, analogously to pyroxenes. The plagioclase grains have homogeneous cores ($\approx \text{An}_{58}$) with zoned rimes up to An_{23} . Rims of alkali feldspars occur on the lath-shaped grains of plagioclases in teschenite rocks while the separate, bar-shaped grains of K-rich feldspars ($\text{Or}_{72-52}\text{Ab}_{28-48}\text{An}_0$) dominate in syenoteschenite and syenite rocks. This Na-sanidine as well as plagioclase grains were replaced by adularia-albite paragenesis; the zeolitization process (analcimisation) was later than deuteric feldspar formation.