

GEOLOGICAL INVESTIGATIONS AND MEETINGS
IN THE PIENINY MOUNTAINS

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The Pieniny Klippen Belt of Poland was the object of interest to many geologists since the beginning of the XIXth century¹. In the first half of this century A. Boué (1830, 1834), L. Zejszner (1831, 1858), G. G. Pusch (1833) and L. v. Lilienbach (1834) did not clearly recognize the independence of the Podhale- and Magura Flysch on the one side, and the carbonate Jurassic-Cretaceous members of the Klippen Belt proper on the other. The generally accepted view was that the Klippes were forming intercalations in the flysch. The morphological character of the calcareous Klippes forming steep rocks mantled by soft marls, shales, flysch deposits etc, attracted many geologists, e.g. S. Staszic (1815), and influenced their views. D. Štúr (1860) compared the Klippes with the reefs, and V. Uhlig (1890) thought that at the end of Neocomian the Klippes represented fragments of an old mountain chain (Inselgebirge) forming islands surrounded by the deposits of the Upper Cretaceous and Palaeogene seas.

An independent group of opinions involved endogenic processes as responsible for the formation of the Pieniny Klippen Belt. It was E. W. Beyrich (1844) who explained the origin of this geological unit mostly by volcanic processes. His opinions were soon abandoned, and starting with E. Mojsisovics (1867) tectonic processes are regarded the major factor acting in the formation of the Klippen Belt. C. M. Paul (1868) recognized anticlinal character of the Belt, and M. Neumayr (1871) thought the variable competition of rocks forming the Belt subjected to tectonic pressure as responsible for its present structure. This author was the first to recognize two major facies in the Mesozoic deposits of the area, known to-day as the Pieniny Series *sensu lato* and Czorsztyn (Subpieniny) Series.

The modern investigations of the geological structure and origin of the Pieniny Klippen Belt were introduced by M. Lugeon (1902, 1903) who regarded the Klippes as being frontal parts of the nappes of the Tatra Mts. An independent opinion was set forth by M. Limanowski (1905, 1913) who regarded the Klippes as borne by great nappes from an area situated south of the Tatra Mts. However, it was V. Uhlig (1907) who determined the proper position of the tectonic units of the Carpathians (Pieniny Klippen Belt included), which still serves as the background for modern tectonic interpretations of the area.

The modern interpretations devote much attention not only to the structural position, but also to the relative age of orogenic phases which influenced the formation of the Klippen Belt. This was already marked in the paper by V. Uhlig (1890), but it was M. Limanowski (1922) who first distinguished two main phases of orogenic movements, the first directed to the N (before Cenomanian), and the other directed „backwards”, to the S (after the Palaeogene).

¹ Editorial Note: For more information on the history of geological investigations of the Pieniny Klippen Belt the reader is referred to papers by K. Birkenmajer (1953 a, 1958 a, 1960 a, b, 1963 a, d), Sokołowski (1954 a), H. Świński (1962), M. Książkiewicz (1963) and others (see the references).

After the World War I the synthetic conclusions as to the formation of the Klippen Belt are based on systematic field investigations and on detailed geological mapping. We may trace the evolution of views in the papers by F. Rabowski (1922, ... 1929) and, especially, by L. Horwitz (1922, ... 1938, and 1963) and D. Andrusov (1926, ... 1961). Of the most recent date are the investigations by K. Birkenmajer (1951, ... 1963) who started detailed mapping of the Pieniny Klippen Belt of Poland in 1950. Recently he distinguishes five Klippen Series (as well as the Haligowce Series and the Exotic Series) and claims to the presence of two main orogenic phases: Laramide Phase and Savian Phase.

The XXXVIth Annual Meeting of the Geological Society of Poland in 1963 is the third meeting of geologists in the Pieniny Mts. The first, in 1903, was connected with the International Geological Congress, Vienna. During the Congress Excursion to the Pieniny- and Tatra Mts. there appeared an opportunity to prove M. Lugeon's views versus those of V. Uhlig, which influenced so many geologists...

During the Annual Meeting of the Geological Society of Poland, 1929, in the Pieniny Mts., L. Horwitz and F. Rabowski on the one hand, and D. Andrusov on the other, presented their conflicting opinions, and the discussion started which allowed to show the problems not adequately elucidated so far.

The third, present meeting of geologists in the Pieniny Mts. allows to discuss the problems of the Pieniny Klippen Belt of Poland in wider aspect of its position in the geological structure of the Carpathians.

Geological Survey