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Research of the k.k. Geologische Reichsanstalt (Vienna, Austria) in Slovakia during the period 1850–1869

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Abstract

As early as two decades after the establishment of the k.k. Geologische Reichsanstalt in Vienna the entire Austro Hungarian Empire was researched and the overview geologic map at 1:576 000 scale was published. The research was based on stratigraphic data supported by paleontologic findings, on study of rock-forming minerals, on investigation of mineral deposits, on topographic surveys and other methods. Those who made the best contributions to the knowledge of the geology of Slovakia during this early period of research were D. ŠTÚR, F. FOETTERLE, F. ANDRIAN, C.M. PAUL, G. STACHE, F. HAUER, M.V. LIPOLD and H. WOLF. They and many other members of the "Vienna geological school" laid the foundations of the modern Carpathian geology.

Forschungsaktivitäten der Geologischen Reichsanstalt (Wien) in der Slowakei von 1850–1869

Zusammenfassung

Bereits zwei Jahrzehnte nach der Gründung der k.k. Geologischen Reichsanstalt in Wien im Jahre 1849 war die erste geologische Aufnahme des gesamten Hoheitsgebietes der Österreichisch-Ungarischen Monarchie abgeschlossen und eine geologische Übersichtskarte im Maßstab 1:576 000 wurde veröffentlicht. Die Aufnahmsarbeiten konnten sich sowohl auf grundlegende biostratigraphische bzw. paläontologische Studien stützen, als auch auf eine gründliche lithologische Bearbeitung sowie auf das Studium mineralischer Rohstoffvorkommen und topographischer Vermessungsarbeiten. Zu den Pionieren der frühen geologischen Erforschung der Slowakei zählen folgende Persönlichkeiten, die allesamt dem Mitarbeiterstab der Geologischen Reichsanstalt angehörten: DIONYS STUR, FRANZ FOETTERLE, FERDINAND von ANDRIAN, CARL MARIA PAUL, GUIDO STACHE, FRANZ von HAUER, MORIZ VINZENZ LIPOLD und HEINRICH WOLF. Diese sowie auch mehrere andere Persönlichkeiten der berühmten "Wiener geologischen Schule" legten den Grundstein für die moderne geologische Karpaten-Forschung.

Výskum c. k. Ríšskeho geologického ústavu (Viedeň, Rakúsko) na Slovensku počas rokov 1850–1869

Abstrakt

Už v prvých dvoch desaťročiach po založení k.k. Ríšskeho geologického ústavu vo Viedni bolo preskúmané celé územie Rakúsko-Uhorskej monarchie a vydaná prehľadná geologická mapa 1:576 000. Výskum sa opieral o stratigrafické údaje potvrdené paleontologickými nálezmi, štúdiom nerastov hornín, výskum ložísk nerastných surovín, topografické merania atď. O poznanie územia Slovenska sa najviac zaslúžili D. ŠTÚR, F. FOETTERLE, F. ANDRIAN, C.M. PAUL, G. STACHE, F. HAUER, M.V. LIPOLD a H. WOLF. Oni a mnohí ďalší príslušníci "viedenskej geologickej školy" vtedy položili základy modernej karpatskej geológie.

The mountain ranges that extend eastward from the Alps were known since the historic times for their rich mineralizations. Gold-bearing Kremnica (Kremnitz), silver-bearing Banská Štiavnica (Schemnitz), copper-bearing Špania Dolina (Herrengrund), Ľubietová (Libethen) and Smolník (Schmölnitz) – they all witness an old and famous mining tradition in the Western Carpathians. Although, the presence of precious and other metals in these mountains was well known, there was little knowledge of their geological structure. Until the first half of 19th century the information could only be obtained from the travel reports of I. BORN, J. E. FICHTEL, J. ESMARCK, CH. ZIPSER, F.S. BEUDANT, A. BOUÉ and other foreign researchers. These publications were basic for the construction of the first geologic review maps (F.S. BEUDANT, G.G. PUSCH, L. ZEJSNER, W. HAIDINGER). In order to obtain more information on the Western Carpathian geology, several scientists from the scientific institutions in Vienna, including those from the Mineralogical Cabinet of the Court Chamber and from the University, took part in the investigations. W. HAIDINGER described several minerals, such as tetradymite from Župkov and hauerite from Vigľašská Huta – Kalinka,

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Banská Štiavnica, Hliník and Smolník. Chemical composition of minerals was studied by A. PATERA; F. HAUER described several fossils and a meteorite from Orava.

An ambitious project to geologically investigate the whole territory of the Austro-Hungarian Empire was launched in 1849, as soon as the k.k. Geologische Reichsanstalt (GRA) was established in Vienna. However, at the beginning only a small team of courageous workers, lead by W. HAIDINGER and later by F. HAUER, undertook this project that also included the research into the Western Carpathian geology. To follow the pathways of those pioneers, let us review the first 20 volumes of the GRA, the bibliography of J. KOLIHA (1919) and of other authors, as well as the Explanations of geologic overview map of Czechoslovakia at 1:200 000 scale since the establishment of the GRA until 1869 when the first detailed and scientific concepts of the Western Carpathian geological structure came to being.

An *overview geological research* into the regions of Western and Central Slovakia was carried out by F. FOETTERLE, D. ŠTÚR, F. ANDRIAN, H. WOLF and A. KORNHUBER, while F. HAUER, F. RICHTHOFEN, F. HINGENAU and A. GLÓS investigated the region east of the Hornád river (F. HAUER, 1869). In 1851 F. FOETTERLE constructed the map of the Oravská Župa (Orava District) and published an information on the coal deposits and on the so called Carpathian sandstone. He also described anatase mineral from Banská Štiavnica and, in 1853, the occurences of fassaite, spinel and other minerals from Hodruša. The composition of tetrahedrites from Smolník was studied by K. HAUER. In 1853 F. FOETTERLE investigated the regions of Western Slovakia and Malé Karpaty Mts. as a follow up of his works made in Southern Moravia. He also worked in the Nízke Tatry Mts. and published the reports in 1854. In the same year V. ZEPHAROVICH described the cinnabarite from the ore veins in Banská Štiavnica. F. HAUER and F. FOETTERLE published in 1855 a monograph entitled "Geologische Uebersicht der Bergbaue der oesterreichischen Monarchie", the first integrated work that also described the ore-deposits in Slovakia.

Since 1852 F. FOETTERLE carried out the research works for the Wernerverein. First he made researches in Southern Moravia and then in Moravian-Silesian Beskydy and Javorníky Mts. H. WOLF helped him during these ventures. South of them, at the Moravian – Hungarian frontier, worked D. ŠTÚR. Equipped with a rich experience from the Alpine terrains and from the southern part of Bohemian Massif, he continued in 1858 to research the areas of Bratislava, Lower and Upper Nitra, Trenčín, Turiec, Liptov and Orava Districts. He also solved geologic setting of the Lower Váh river area and of the region between Váh river and Malé Karpaty Mts. In 1859 he presented a geologic overview map of the Váh and Nitra rivers areas. He also investigated Liptov and Turiec basins, characterized several sedimentary formations of the NW Carpathians and described mineral water spring in Liptovský Ján. In 1859 his paper on "Kössen Member of the northwestern Hungary" was published. His complete report on the results of the geological mapping in the Váh and Nitra river areas was published in 1860. In it he characterized for the first time the general structure of the Western Carpathians, compared it to the Alps and specified 9 core mountains (krystallinische Inseln). In the same year his information on the occurrences of Jurassic rocks in the NW Hungary and his paper on *Congeria* and *Cerithium* beds in Malé Karpaty Mts. were also published. F. FOETTERLE worked in the Lower Nitra and Zvolen Districts, while H. WOLF in Hont and Novohrad Districts. F. HOCHSTETTER investigated SE part of the Carpathians. F. HAUER made the research into Šariš District and constructed an overview map of NE Hungary. In March 1859 F. FOETTERLE presented a geologic overview map of NW Hungary that covered an area of 785.8 sq miles. The map was compiled using the backgrounds from F. FOETTERLE, D. ŠTÚR, H. WOLF, F. ANDRIAN and A. KORNHUBER who mapped the surroundings of Bratislava. But older materials were also used. In 1859 F. ANDRIAN reported the results of geologic overview mapping of the Slovak Ore Mountains area in the Spiš and Gemer Districts. He also described the deposits in Spiš and Gemer and the structures surrounding Dobšiná. F. HAUER worked within the Torysa and Hornád rivers drainage areas. In 1858 he, together with F. RICHTHOFEN, published a report. In 1860 F. RICHTHOFEN characterized in detail Tertiary eruptive rocks of Hungary (from Štiavnické vrchy hills and Eastern Slovakia) and Transilvania, as well as their development and relationship to metallic ore deposits. K. HAUER published chemical analyses of mineral and thermal water from several spas.

The geologic overview mapping of the Austro-Hungarian Empire was completed in 1862.

Since 1863, the research works continued at full rate by *detailed mapping* that included revisions and amendments to existing maps. As early as in 1863 F. FOETTERLE published 6 sections through Malé Karpaty Mts. F. ANDRIAN and C.M. PAUL also took part in these activities (several papers published in 1863 and 1864). F. BABÁNEK also participated in the mapping of the Lower Váh basin. C.M. PAUL presented geologic map showing the area between Morava river and Malé Karpaty Mts. Besides, he informed about the remnants of *Ursus spelaeus* found near Plavecký Sv. Mikuláš and solved the geological setting of the Strážovské vrchy Mts. near Žilina. F. HAUER, together with B. WINKLER, worked in the Tríbeč Mts. and in its surrounding, in the Tekov District. F. HAUER characterized the formations near Trenčianska Teplá. D. ŠTÚR explained the mechanism of a rare natural phenomenon – periodic spring near Stratená.

In 1863 and during the following years the research campaigns in the Western Carpathians were strengthened by young specialists (D. ŠTÚR, 1886).

Geologic research in the area of SW Slovakia continued in 1864. F. ANDRIAN and C.M. PAUL characterized in detail both, the crystalline rocks and the younger formations of the Malé Karpaty Mts. Their work was supported by sections and topographic surveys. The research into Tertiary fossils was made by M. HÖRNES. H. WOLF studied the Miocene sediments from the Biele Karpaty Mts. F. HAUER constructed the geological map showing the surrounding of Trenčín, Piešťany and Nitra; he also reported on the results of investigations made in the Tríbeč Mts., as far as the boundary of Neogene volcanic rocks in the Pohronský Inovec and Vtáčnik Mts. The area around Trenčín was investigated by J. ČERMÁK and F. POŠEPNÝ, while the area of Strážovské vrchy Mts. by C.M. PAUL. The Váh river region in the northern part of Trenčín District was studied by F. BABÁNEK and the area lying more to the south by A. HOŘÍNEK. The whole map of the Trenčín District was compiled by F. FOETTERLE. G. STACHE took part in the research into the geology of Považský Inovec Mts. and, together with J. ČERMÁK, they investigated the Upper Nitra and areas along the margins of Strážovské vrchy Mts. and Malá Fatra Mts. F. ANDRIAN also worked in the Fatra Mts. and in Turiec basin, but also started to research the Neogene volcanic rocks of Kremnica and its surroundings. G. STACHE continued from the Upper Nitra area easterly, as far as the Kremnické vrchy hills. E. WINDANKIEWICZ published the results of research into metallic ore veins of Banská Štiavnica.

In 1865 F. HAUER presented the results obtained from the Bánovce basin, as well as from the area between Nitra and Považský Inovec Mts. and Tríbeč Mts. NE of Nitra, where he was assisted by B. WINKLER. C.M. PAUL together with A. HOŘÍNEK and F. BABÁNEK continued their geologic studies of the Trenčín District. The area of Strážovské vrchy Mts. was mapped by F. FOETTERLE. G. STACHE investigated the area of Upper Nitra, but also studied the crystalline rocks of the Žiar, Malá Magura and Suchý Mts. J. ČERMÁK co-operated with him and character-

ized the Handlová coal-bearing formations. Having finished his research works in Turiec basin and in the Malá Fatra Mts., F. ANDRIAN continued in the area between Nová Baňa and Pukanec in the SW part of Central Slovakian, Neogene, volcanic region. C. M. PAUL worked in its eastern part, in the surroundings of Krupina, Zvolen, Sliač and as far as Lučenec. By the end of this year, F. ANDRIAN presented a map showing large tracts of Central Slovakian volcanics of Neogene age and of their surrounding. The area of Hont and Novohrad Districts, particularly the surroundings of Krupina and Lučenec, were investigated by F. FOETTERLE, M. RACZKIEWICZ and O. HINTERHUBER. E. WINDANKIEWICZ characterized in detail the metallic ore vein Grüner in Banská Štiavnica. The sulphur deposit near Kalinka was investigated by W. GÖBL.

During the summer season 1866 D. ŠTÚR, as the Chief Geologist of the 3rd department, resumed specialized geologic research in the Western Carpathians. The investigations took place in the broader surroundings of Banská Bystrica and Brezno, between the Hron and Váh rivers and included Nízke Tatry Mts., northern part of Vepor Mts., and Veľká Fatra (surroundings of Ružomberok). D. ŠTÚR informed about the fossils found in Ľupča and about the Nízke Tatry Mts. granite massif. Meanwhile, H. WOLF prepared the geologic map showing northern part of Liptov and Turiec Districts and C. M. PAUL worked in the eastern part of Štiavnica Mts. and in the Southern Slovakian basin north of Matra Mts. There he studied mainly the Tertiary units. F. FOETTERLE carried out the research in the surroundings of Rimavská Sobota and presented a map showing the geology of the Balassa-Gyarmat area. During the research into the Cserhát Mts., G. STACHE marginally touched our territory. F. ANDRIAN presented the geologic map showing SW part of Central Slovakian Neogene volcanics, including the basin near Žiar nad Hronom and started to research the geology of the Matra Mts. The geologic map of the surroundings of Lučenec was presented by O. HINTERHUBER. F. FOETTERLE described fossils from the open pit in shales near Mariatal and in the following year F. HAUER characterized the ammonite fauna from the same locality. M.V. LIPOLD constructed a section through the Banská Štiavnica ore district. F. GRÖGER described the mines in the vicinity of Vyhne, E. WINDANKIEWICZ described the gold and silver mines in Kremnica and O. NEUPAUER the iron deposits near Cínobaňa. At the GRA meetings D. ŠTÚR informed about the earthquakes that shocked Slovakia in 1858 and 1866.

The activities of all three GRA departments in Slovakia continued in 1867. D. ŠTÚR led the investigations in the Orava region, on the map sheet Námestovo. He mapped the Liptov area on the map sheet Ružomberok and in the same year he described the Gault (Albian) development in Orava and in the surroundings of Ružomberok. Then he reported on the results of geological researches obtained fom the vicinity of Liptovská Lúžna and from Korytnica in the Revúca valley. R. MEIER assisted him as a substitute for wounded H. WOLF. D. ŠTÚR published an important paper on the flora of freshwater quartzites and on *Congeria* and *Cerithium* facies of the Vienna and Hungarian basins. R. MEIER reported the results obtained in the area surrounded by Ružomberok, Kraľovany and Dolný Kubín. In the same year F. FOETTERLE published data concerning the Trenčín District geology, but also intensively mapped the area near Rimavská Sobota (a map presented in 1867). Besides, he studied the area surrounded by Tisovec, Jelšava, Hron river valley and Muránska planina plain, as well as the eastern part of Nízke Tatry Mts. In 1868 he presented an overview map of the northern part of Gemer District. Meanwhile, R. PFEIFFER mapped the Upper Hron valley region and G. STACHE in both, Liptov basin and Western Tatra Mts. In the same year he presented an overview geologic map of the Hungarian part of Vysoké Tatry Mts., and described a broader area that included eastern part of Nízke Tatry Mts. and parts of Liptov and Poprad basins. C.M. PAUL worked in Orava and in Malá Fatra Mts. and presented a map of northern Orava. E. MOJSISOVICS investigated flysch and klippen belts in northern Orava, Liptov and on Polish side of Vysoké Tatry Mts. and also studied their eastern continuations in Šariš District near Plaveč. In the same year he presented a map showing the western part of Vysoké Tatry Mts. and Choč Mts. The research into the area of Liptov and Turiec Districts was carried out by H. WOLF, who also began to investigate Tokaj Mts. F. ANDRIAN not only worked in the northwestern part of Spišsko-gemerské rudohorie (Spiš-Gemer Ore Mountains), but also in the eastern part of Nízke Tatry Mts. in the broader surroundings of Vernár and Liptovská Teplička and near Dobšiná and Štítnik. M.V. LIPOLD investigated the rocks, metallic ore veins and minerals of the Central Slovakian Neogene volcanics in the areas of Banská Štiavnica, Píla, Nová Baňa, Pukanec and Rudno. To construct his geological map he also used data obtained from staff of particular mines, and from the Heritage tunnel. His knowledge he summarized in the publication "Der Bergbau von Schemnitz in Ungarn". During 1867–1869 K. HAUER analysed feldspars from the Neogene volcanic rocks from Štiavnica Mts. and from Estern Slovakian Dubník near Prešov.

In 1868, this large team work was about concluded. D. ŠTÚR published an extensive "Report on the geologic mapping of the Upper Váh and Upper Hron river regions" and presented the geologic map. Together with R. MEIER they worked in the Spiš-Gemer Ore Mountains, in the area among Hornád, Slaná and Bodva rivers. R. MEIER mapped the area of Spišská Nová Ves. At a meeting D. ŠTÚR discussed the structure of the Volovec and Galmus Mts., north of Smolník, in the Spiš-Gemer Ore Mountains. F. FOETTERLE presented geologic overview map showing northern part of Gemer District and including a part of Slovak Ore Mts. and eastern part of Nízke Tatry Mts. F. ANDRIAN concluded his researches in the area between Dobšiná and Štítnik. G. STACHE characterized Kössen beds in the area of Vysoké Tatry Mts. and investigated tectonic setting of klippen located in the surroundings of Stará Ľubovňa. Then he determined the age and the composition of rocks exposed north of Vysoké Tatry Mts. U. SCHLOENBACH described ammonites from the surroundings of Párnica in Orava. M. NEUMAYR's first works also dealt with the fossils found in the klippen belt and in his publications of 1869 and 1871 he presented detailed descriptions of the fauna from Pieniny part of klippen belt. H. HÖFER investigated the boundaries between Spiš and Šariš Districts, described the klippen near Plaveč and studied the melaphyre rocks in the Nízke Tatry Mts., and their chemical composition. During the period 1868–1870 C.M. PAUL worked in northern part of Šariš and Zemplín Districts, between Prešov and Bardejov. He also mapped the Humenské vrchy Mts. and presented a geologic map of this area. H. WOLF made investigations in the Bodrog valley, Slanské and Tokajské vrchy Mts. In the Jahrbuch R. MEIER published an extensive paper on the gold-stibnite mines in Magurka, Nízke Tatry Mts. F. VIVENOT described quartz crystals from Banská Štiavnica that were later exposed in the GRA museum; in the next year he published a contribution to the topographic mineralogy of Austria and Hungary and together with J. FAUSER they reported on fauserite finds in Hodruša.

In 1869 the geologic activities in Slovakia, then northern Hungary, came to an end. D. ŠTÚR published the "Report on the geologic mapping in the surroundings of Smolník and Gelnica" and also described the breccias with ammonites collected near Korytnica. G. STACHE presented the geologic map of Pieniny klippen belt and started to solve geologic setting of the broader surrounding of Užhorod. Apart from the area north of Vihorlat Mts., C.M. PAUL also investigated the Eastern Slovakian flysch in the Šariš, Zemplín and Užhorod Districts and the Mesozoic

rock outcrops near Humenné. M. NEUMAYR investigated the Magura flysch in the Užhorod District. H. WOLF worked in the surroundings of Košice and Prešov, and also made researches into the area of Slánske vrchy Mts. He published the explanations of geologic maps of broader surroundings of Tokay and Zemplín Mts., Eastern Slovakia. F. FOETTERLE constructed geologic map showing South Slovakian karst in the area between Turňa nad Bodvou and Szendrö. F. VIVENOT added several mineral identifications in the topographic mineralogy of Slovakia. E. GLASEL published the results of chemical analyses of mineral water from Rajecké Teplice.

On the basis of gathered information F. HAUER compiled in 1869 the geologic map of the Western Carpathians, sheet III, at a scale 1:576 000. At the same time he summarized the explanation of this map using dozens of publications of various types and scopes. The synthesis was based mainly on stratigraphy. D. ŠTÚR and other scientists made tremendous efforts to correctly identify fossils, therefore, most definitions of lithostratigraphic and biostratigraphic units are still valid. Finally, the mosaic of partial and regional data was summarized and an outline of the Western Carpathian geologic structure and of the relationships between the Austrian Alps and Carpathians (D. ANDRUSOV, 1958) was made.

It is needless to guess how much experience from the Alpine and other regions the GRA geologists used to make their lithostratigraphic correlations in Slovakia. But their fingerprints are clearly seen in the Western Carpathian geology in such terms as Gutenstein limestone and dolomite, Lunz and Werfen Members, Reingraben shales, Hierlatz, Reifling and Wetterstein limestones and many others. On the other hand, they invented a number of local new terms, such as Orlové sandstone, Praznov Member, Púchov marls, Súľov and Upohlav conglomerate (D. ŠTÚR, 1860), Veterník limestone (C.M. PAUL and F. ANDRIAN, 1864), Czorsztyn limestone and Choč dolomite (E. MOJSISOVICS, 1867) that are still in use.

F. HAUER (1869) reported on the geologic staff engaged in the Western Carpathians between 1863 and 1869. It included the following chief geologists: F. FOETTERLE, M.V. LIPOLD, D. ŠTÚR and F. HAUER and the department geologists: G. STACHE, H. WOLF, F. ANDRIAN, C.M. PAUL, E. MOJSISOVICS and M. NEUMAYR. The Ministry also allocated mining engineers and practitioners, F. BABÁNEK, J. ČERMÁK, L. HERTLE, A. HOŘÍNEK, F. POŠEPNÝ, J. RACHOY, F. RÜCKER, F. STERNBACH, E. WINDANKIEWICZ and B. WINKLER in 1863; J. BÖCKH, A. GESELL, W. GÖBL, F. GRÖGER, O. HINTERHUBER, O. NEUPAUER, A. OTT and M. RACZKIEWICZ in 1864; J. HOFMANN, H. HÖFER, E. LANGER, R. MEIER, A. PALLAUSCH and R. PFEIFFER between 1866 and 1867 (in: D. ŠTÚR, 1886). In addition, unpaid volunteers Prof. C. HOFFMAN, Dr. A. MADELUNG, F. VIVENOT and K. GRIESBACH were engaged in the projects (D. ŠTÚR, l.c.; J. TIBENSKÝ et al., 1988). Traditionally, the graduates from the Mining Academy in Banská Štiavnica (among which were also F. HAUER, M. V. LIPOLD, F. FOETTERLE and D. ŠTÚR) co-operated with the GRA. Other close co-operators were professors J. PETTKO and G. FALLER from the Academy and professor J. SZABÓ of the Budapest University (Š. BUZALKA, 1981).

Dr. G. ZECHENTER and J.B. KLEMENS, the members of contemporary Slovak intelligentsia, also contributed to a common goal. In appreciation of their love for the nature D. ŠTÚR appointed them corresponding members of the GRA. Another scientist that took part in some ventures was F. HAZSLINSZKY. Dr. A. KENNGOTT and prof. A. KORNHUBER investigated the surroundings of Bratislava. Thanks to prof. KORNHUBER, the Scientific Association of Bratislava (founded in 1856) co-operated with the GRA.

Unfortunately, it is beyond the scope of this paper to mention all those who helped promote the Western Carpathian geology. The activity of one of them, D. ŠTÚR, appointed Director of the GRA in Vienna, was summarized on the occassion of 100th Aniversary of his death (O. MIKO & O. SAMUEL, 1994).

Several GRA employees made barometric and trigonometric measurements as parts of research programmes, thus, they contributed to the geographic knowledge of Slovakia. They are cited in the papers of A. SENONER, H. WOLF, F. FOETTERLE, D. ŠTÚR, F. ANDRIAN, C. M. PAUL, A. RÜCKER and others. The Quaternary glaciation is shown in the geologic map of Tatry Mts. compiled in 1867 by G. STACHE. To inform domestic readers about the geology and geography of Slovakia, D. ŠTÚR published in 1862 a popular-scientific paper "Geologic-geographic scheme of Slovakia". This publication was fundamental for the concept of a modern orographic division of the Western Carpathians.

The works of the GRA in Slovakia were concluded in 1869 and the activities of the GRA were relocated to other parts of the monarchy. In the same year the Hungarian Royal Geological Institute (Magyar Kiraly Földtani Intézet) was established in Budapest. However, the scope of its activities was not focused on geologic mapping, but on the research, exploration and mining of mineral deposits. During the following years many Austrian geologists came back to Carpathians and as a result, several publications were issued, including the UHLIG's well known "Bau und Bild der Karpaten" published in 1903 as part of "Bau und Bild Österreichs".

The second half of 19th century saw an enormous progress in the earth sciences. The GRA always stayed abreast with these trends. Since its establishment it made ambitious steps towards organized scientific research based on the collection of data and interpretation of results. The exchange of information and international co-operation also played an important role. And its point was always to implement the obtained scientific knowledge in practice.

All those undaunted knowledge hunters that for years strolled with hammers, maps and notebooks across the Slovak mountains, fields and mines laid the foundations of Carpathian geology and of Slovak science. During the period 1850–1869 the renowned "Vienna geological school" achieved in Slovakia a success to be remembered forever.

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