

## **Aspects of Antal Koch's Activity Depicted by His Correspondence**

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**Abstract:** The study of some unpublished documents – letters, official addresses, drawings and sketches dated 1884–1910 – from the personal archive of professor Antal Koch, geologist and founder of the Cluj university school, reveals his professionalism in approaching scientific research, adding details about his relationship with contemporary personalities. These inedited documents have recently been found in the Paleontology-Stratigraphy Museum's archive at the Babeş-Bolyai University in Cluj.

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The famous geologist, petrologist, mineralogist and palaeontologist was born in Sombor, present-day Serbia (known as Czoborszentmihály until the 16<sup>th</sup> century, in the former Hungarian Kingdom), in a family devoted to natural sciences (father – geographer, uncle – mineralogist, brother – chemist). In 1864 he graduated the University of Pest – mathematics and natural sciences, until 1868 when, after being a teacher at several secondary schools, he became Professor József Szabó's assistant at the Faculty of Geology at same university. In 1869 he was employed at the Institute of Geology in Pest. Getting a scholarship at the universities of Vienna and Bonn, he returned to Buda in 1871 as a secondary school teacher and in 1872 he was



appointed university professor at the Department of Mineralogy and Geology of the newly founded University of Cluj and Director of the Geology Institute. He was

awarded the *Doctor Honoris Causa* degree in 1874 and he was Rector of this university in 1891/1892 session.

He travelled a lot to perform his research in both Transylvania and Hungary, as well as in other European countries (Germany, France, England, Holland, Belgium, Switzerland). He published over 200 scientific works: monographs, studies, articles in scientific journals home and abroad, being a member of the editorial staff in some of them (*Földtani Közlöny* in Budapest – 1871–1873, and *Orvos és Természettudományi Értesítő* in Cluj – 1879–1895).

In 1895 he was appointed Professor at the University of Budapest, Department of Geology and Palaeontology, and during 1904–1910 he was President of the Hungarian Society of Geology (Magyar Földtani Társulat).

He was the most active member of the Natural Science Section of the Society of the Transylvanian Museum, and he succeeded through his activity to clarify some problems related to the geological evolution of Transylvania. He had also a significant contribution to the enrichment of the Mineralogy and Geology Museum's mineral collection from Cluj University.<sup>1</sup>

Some of the documents discovered as being part of his private archive as letters, official addresses, drawings and sketches, show the scrupulosity and rigour applied by this scientist to the topics of his research as well as the readiness to answer to his collaborators, to perform his working tasks and to respond to requests from people interested in different geological aspects of Transylvania (Gheorgheni, Praid).

### **Correspondence with Miksa Hantken**

The famous academician Miksa Hantken<sup>2</sup> returned the fossil material to Professor Koch, after identifying every specimen, accompanied by a letter comprising a listing of the determined species, some of them with notes added.

Many species of Bryozoa (also known as Ectoprocta) such as: *Cellaria sp.*, *Membranipora angulosa* Rss., *Batopora conica* Hantk., *Eschara papillosa* Rss., *Biflustra macrostoma* Rss., *Vincularia Haidingeri* Rss., *Acropora coronata* Rss., *Cupularia bidentata* Rss., *Lumulites quadrata* Rss., *Idmonea*, *Hornera*, *Entalophora* have been listed.

As referring to some species of Foraminifera found in Cluj, Hantken questions whether these are similar to those found in the marlstones in Buda (Budapest) and those found by Reuss in the Miocene deposits from Vienna, described as being the *Cerriopora globulus* strata (Fig.1).

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<sup>1</sup> Vanek Ferenc, "Koch Antal", in *Hivatás és tudomány: az Erdélyi Múzeum-Egyesület kiemelkedő személyiségei*, (Mission and science: outstanding personalities of the Transylvanian Museum Society) (Kolozsvár: Erdélyi Múzeum-Egyesület, 2009), 283–339.

<sup>2</sup> Palaeontologist, Professor at the University of Budapest and the first Director of the Institute of Geology in Budapest between 1869 and 1882.

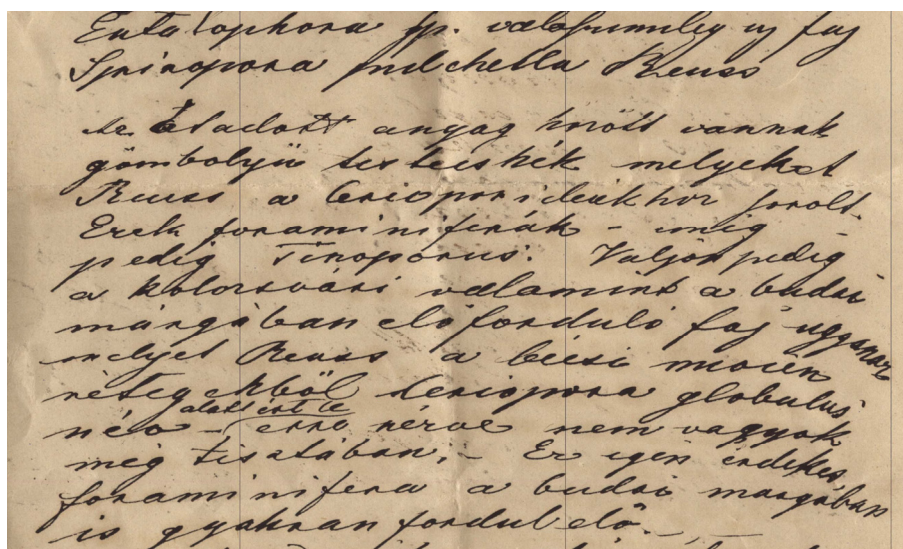


Fig.1: Facsimile of Miksa Hantken's letter fragment referring to some Bryozoa species

The Porcsesd (Porcești-Sibiu) Foraminifera have also been mentioned as belonging to the *Assilina* and *Nummulites* genera, with some doubts regarding their identification (*Assilina granulosa* or *Assilina mamillata*) but very certain about the age of the strata: those with *Assilina* are older than those with *Nummulites intermedia* (Fig.2).

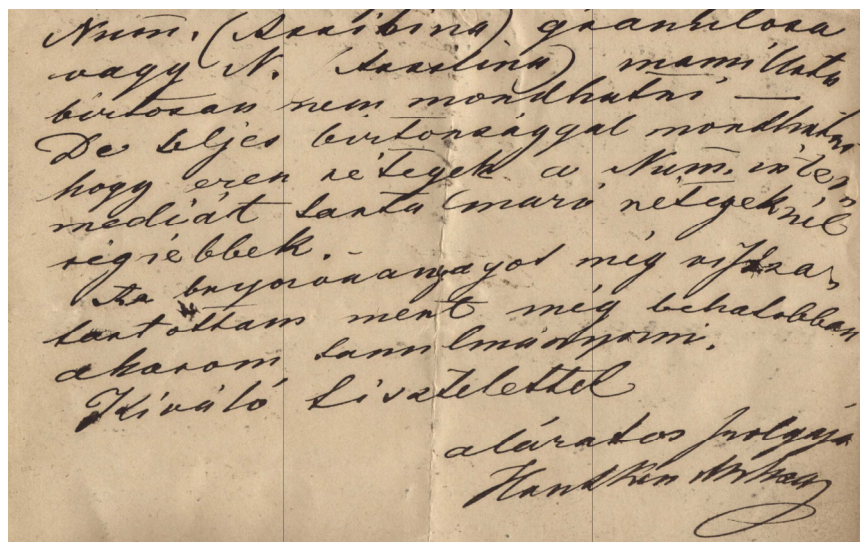


Fig.2: Facsimile of Miksa Hantken's letter fragment showing a reference to *Assilina* and *Nummulites* genera

### Correspondence with Theodor Fuchs

In the letter dated 24 December 1884, Fuchs communicated the result of identifying the fossils sent from Hídalmás (Hida – Sălaj) with delay due to busy schedule, and hoped that the material he sent returned safely in Cluj.

There is a comment about the age of Hida strata, as compared to other representative strata from some cities in Austria (Molt, Loebendorf, Karad?) (Fig.3). In this letter professor Koch was asked also to receive a scientific article of Fuchs to be published in a future issue of the Society of Geology<sup>1</sup> publication. At the end of the letter typical end-of-the-year wishes are addressed.

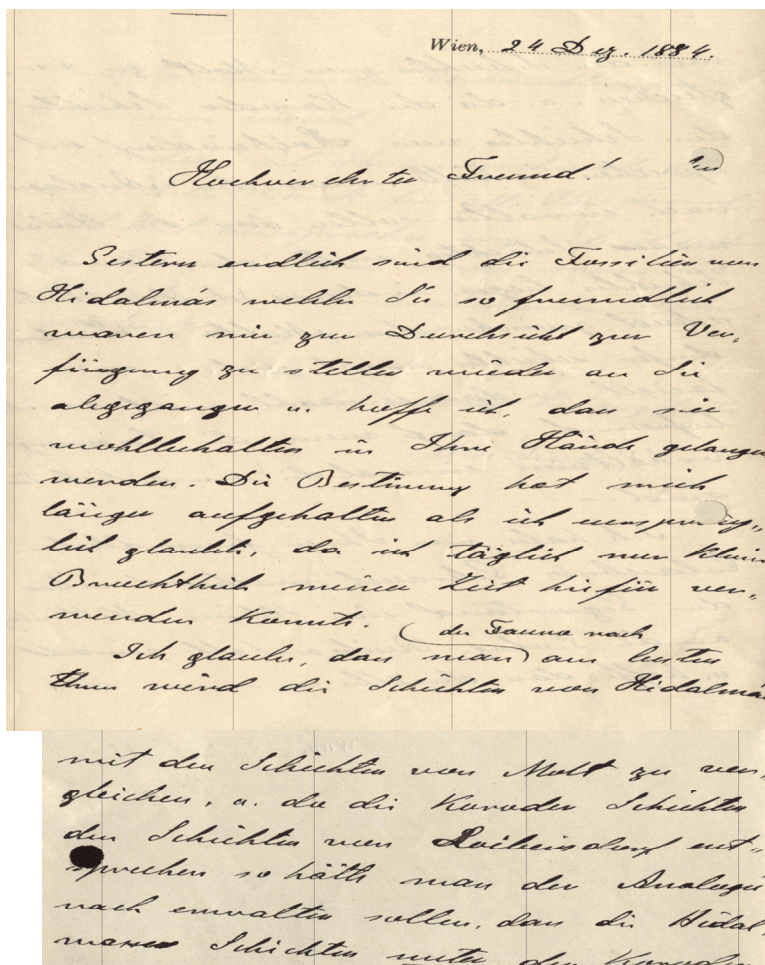


Fig. 3: Facsimile of Theodor Fuchs's letter – two fragments showing reference to Hida strata

<sup>1</sup> Reference is made to the Department of Natural Sciences of the Transylvanian Museum Society.

### **Correspondence of Alajos Gencsi – Gheorgheni 1885**

Alajos Gencsi, a notary from Gheorgheni, addressed his thanks to Professor Antal Koch (with utmost respect and special consideration) for the permission granted during a visit he paid in Cluj to ask questions on some rocks found in Gheorgheni area.

The letter reveals that two types of rocks were sent for analysis. One was light coloured, considered by Gencsi as being andesitic tuff (“andezit tuffaknak”), rich in sodium. Of this he sent also two cubes obtained by mixing this type of rock with lime resulting in a cement-like resistant waterproof material, which he considered as a replacement for natural puzzolanas (trass) (Fig.4). The purpose was to get the Professor’s confirmation to proceed with the licensing of this processing method and raise funds from an influential person.

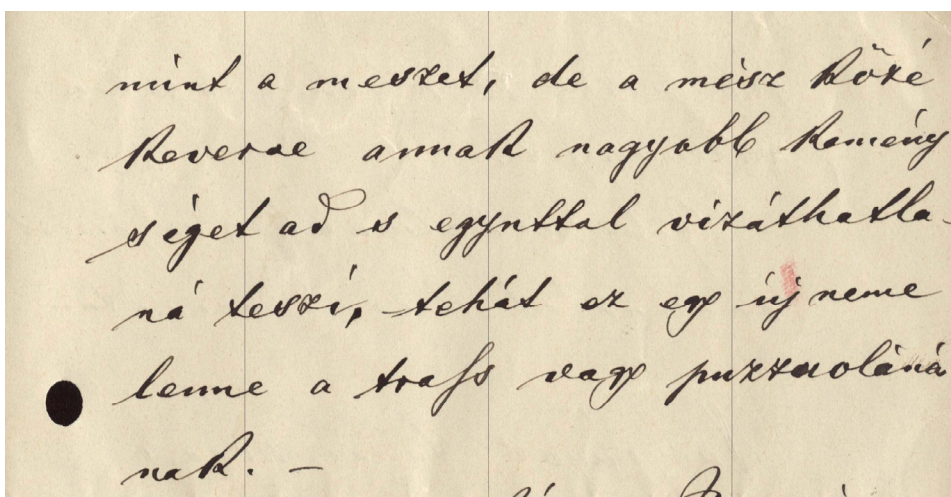


Fig. 4: Facsimile of Alajos Gencsi’s letter fragment

The other rock he sent was considered cupriferous („rézkovand”), but looked different from the known ones. The letter concludes with the request addressed to Professor Koch to express his opinion on the sent samples.

### **Correspondence between János Boeckh (Böckh)<sup>1</sup> and Antal Koch – October–November 1886**

The letter sent by the Director of Budapest Institute of Geology (János Boeckh) is addressed to the head of Cluj University’s Institute of Geology and Mineralogy (Koch A.) in answer to a request of the latter to receive a collection of rocks by donation. This answer came very fast after the request (there is only one day between the request and the answer), with the specification that the 173 pieces of the collection were already prepared for expedition to Cluj. Thanks are then expressed for the promise to send also from Transylvania such donations of minerals and rocks

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<sup>1</sup> János Böckh (1840–1909), Director of the Geological Institute of Hungary in 1882.

that were not displayed at the Institute of Budapest, such as syenite with nepheline from Ditrău, but also gemstones (displaying these minerals and rocks in collections of Budapest Institute of Mineralogy would improve the image of Transylvania).

Professor Koch's answer to this letter (which looks like a draft) was sent on 14 November 1886, confirming he received the donation from Budapest and included it in Cluj University's Institute of Geology and Mineralogy collection. Professor Koch also announced sending to Budapest some fossils collected by himself from the area of the thachytic rocks at Szentendre–Visegrád (Hungary) until the moment when he can keep the promise to gather and send the mineralogical material from Transylvania (syenite with nepheline from Ditrău and samples of gemstones).

### **Correspondence of Károly Herepei – 24 December 1886**

Károly Herepei,<sup>1</sup> a teacher at Aiud College, made the first description of the morphology and geology of the south-western part of the Transylvanian Plateau in 1865, accompanied by a geological sketch. Then in 1896 he published in Aiud the monograph of Alba County, assigning a whole chapter to the geology of the county. He addressed a letter to Professor Koch mentioning the issue of the fossils found at Felső Orbó (Gârbova de Sus – Alba). In his letter he stated that in this location a larger quantity of fossils had been found (hundreds of pieces) and he believed that "there are some fossils among them that haven't been yet described". The importance of *Clypeaster* genus was emphasized (Fig.5).

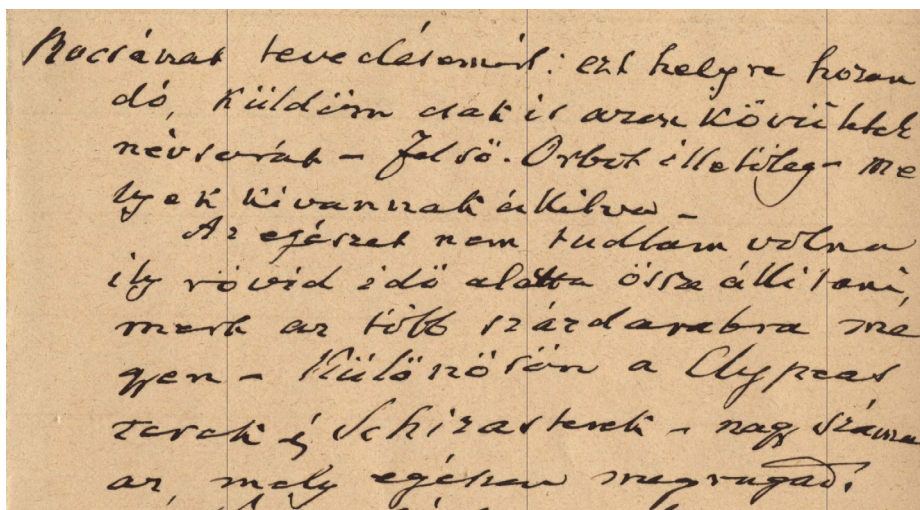


Fig. 5: Facsimile of Károly Herepei's letter fragment

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<sup>1</sup> Károly Herepei (1817–1906) attended the Academy of Mining and Forestry, Selmechánya (Schemnitz, Banská Štiavnica – Slovakia)

**Correspondence of engineer Béla Zsigmondy** – Budapest, 20 March 1887

In this letter, engineer Zsigmondy, who was responsible for the drilling works at Püspökfürdő (Báile 1 Mai), reports to professor Koch about the stage of the works and difficulties he encountered (delays due to technical flaws). The report states that the samples were regularly taken, while three of them were sent out for study (depths of samples have also been reported: 72.54 m, 83.23 m and 85.83 m). The depth of 76 m has been noted to show a change in the composition of the material extracted. Current depth at report's date was 87 m.

Eng. Zsigmondy supposed the samples taken and sent were a limy shale, and asked Professor Koch to confirm his opinion and to let him know if he knew this type of rock and its geological origin (Fig.6).

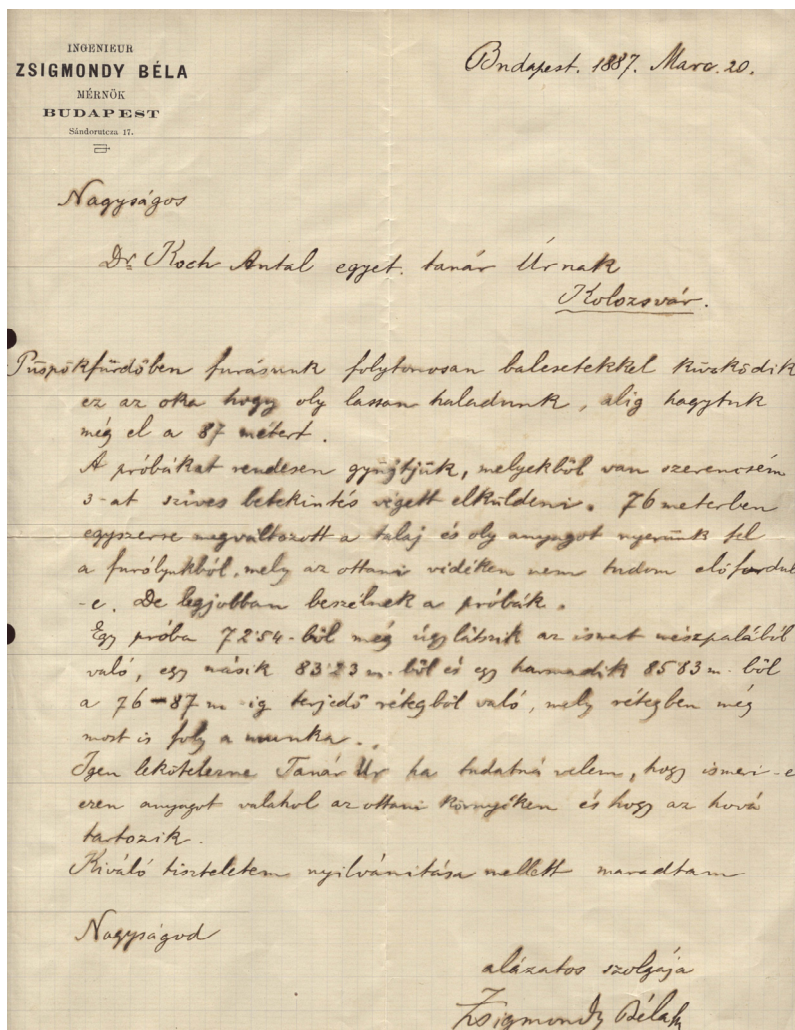


Fig.6: Facsimile of Béla Zsigmondy's letter

**Letter addressed to the Minister of Cults and Public Education in Budapest – 18 March 1893**

This is the copy of the letter mailed by Antal Koch to the Minister of Cults and Public Education in Budapest as a consequence of the ministerial measures received in December 1892 and February 1893 (order no. 55261/10 Dec. 1892, and order no. 8191/18 Feb. 1893, respectively) to make and send to Budapest a copy of the items inventory register belonging to the Institute of Mineralogy and Geology in Cluj, after possible annulments.

In this letter the pattern of recording the Institute's items was described together with the inventory and annulment list for lost or damaged items. He also tried to explain the losses and disappearance of some items and instruments belonging to the Institute because they were left behind by students' negligence after lab classes in the same areas where the collections of the Transylvanian Museum were displayed and visited by the public who might have been tempted to steal them.

*„...Thus it could happen that by mere negligence some items and instruments were left behind and exposed to view, so that during summer when the collections of the Transylvanian Museum were being visited by a public they might have been stolen...”*

He assured the leaders of the ministry that he took concrete safety measures to protect the inventory items and to avoid such incidents in the future. Professor Koch dared to get the annulment approval without being charged for the losses by simply reminding that the quantity of items donated by him to the Institute exceeded the lost ones.

**Official letter of the Dean of the Faculty of Mathematics and Natural Sciences, Dr Gyula Farkas**

The official letter (registered at no. 13800 in the registers of the Ministry of Cults and Education in Budapest) of the Faculty of Mathematics and Natural Sciences Dean, Dr Gyula Farkas<sup>1</sup> to Professor Koch Antal as full University Professor and Director of Cluj University Institute of Mineralogy and Geology was dated 16 April 1893. In this letter annulment of some items from the inventory, including the material recorded in 1892, has been confirmed and the existence of an annexed list with the specified item prices is emphasized. The Director of the Institute was announced that he could carry on with the action in accordance with Minister-Counsellor Sándor Leövey's order (dated 5 April 1893), the copy of that order being attested in Cluj on 15 April 1893, by the notary János Balogh (registration no. 380-1982/3) (Fig.7).

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<sup>1</sup> Gyula Farkas – Professor at the Theoretical Physics Department at the University of Cluj since 1887 until 1915; probably the most cited mathematician and physicist of this university.



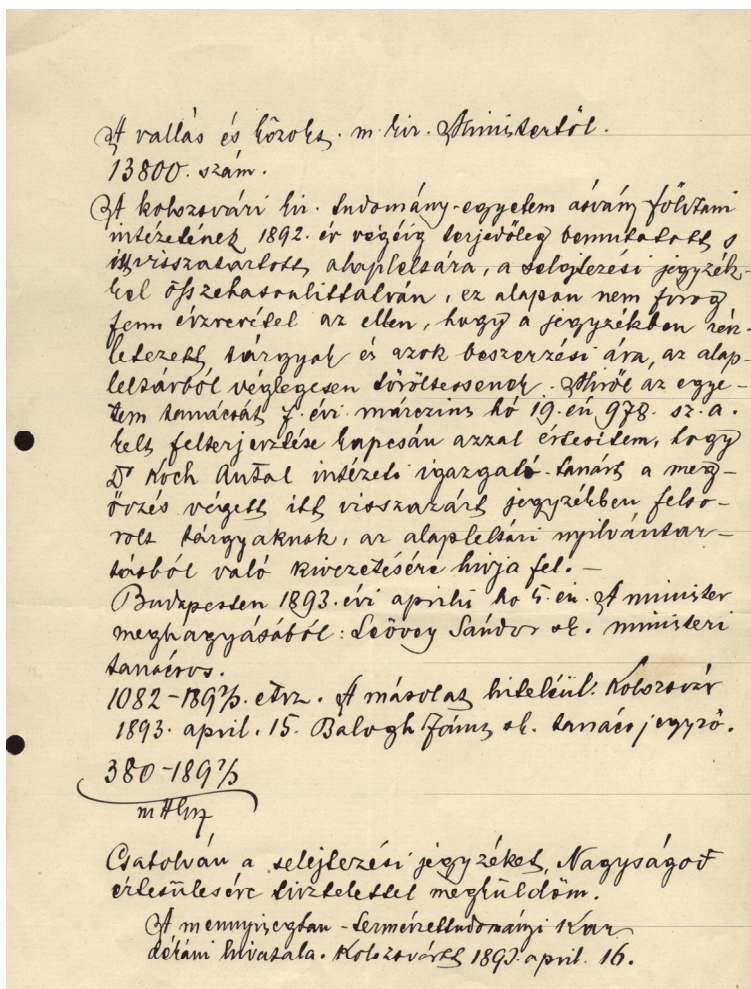


Fig. 7: Facsimile of Gyula Farkas's letter

**Kálmán Benedek's correspondence – Praid, 28 April 1908**

The answer of the person in charge from the Praid Salt Mine to an official letter of Professor Koch dated April 25<sup>th</sup> (register no. 57) refers to the lack of a geological map for the salt mine area and its surroundings, except for two maps showing salt layers and their inclination, one for in-depth works at 1:500 scale and one for Erzsébet (Elisabeth) gallery at 1:1399 scale. It has been mentioned that in order to make a geological map, drillings would be needed. If the existent maps were helpful, copies would be sent to Cluj.

As regarding some sketches and drawings discovered as part of Professor Koch's personal archive, they are mostly illustrations (personal drawings, reproductions of other drawings) of some significant topics found in his studies:

- ❖ Description of trachitic formations in the Danube area (right side, close to Visegrád)<sup>1</sup>;
- ❖ Description of an extinct volcano (Roderberg – near Rolandseck, near Bonn), a volcanic lake in the Mountains of the Rhine Valley (Laach See), and also volcanic formations of Siebengebirge chain<sup>2</sup> mountains;
- ❖ Sketches of some basalt bodies from Remagen am Rhein (Scheidsberg),<sup>3</sup> in Aussig – Switzerland (Wargotsch), from Ramersdorf, near Bonn (Casseler Ley) and from the Balaton area (Somlyóhegy);
- ❖ Landslides from Sóllyomkő area (Şinteu – former County of Cojocna);
- ❖ Illustration of pluvial erosion land forms at Râpa Roşie (Sebeş – Alba County)<sup>4</sup>;
- ❖ Drawing of the Străjuţ Hill (Mehadia) – called here “the porphyritic hill”, belonging to Mehadia rhyodacites;
- ❖ Drawing of the volcanic mountain Monte Nuovo in Italy (view from Pozzuolli), erected after a volcanic eruption in 1538;
- ❖ Drawing of the volcano Mount Vesuvius (apparently dated 13 September 1881, in a dormant state), capturing the last (at that time!) effusive-blasting eruption in 1872.

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<sup>1</sup> Antal Koch, *A Dunai trachytcsoport jobbparti részének (Sz. Endre - Visegrád - Esztergomi hegycsoport): földtani leírása* (Geological description of the trachitic formation of the right side of the Danube) (Budapest: Mag. Tudom. Akad. Könyvkiadó, 1877), 299.

<sup>2</sup> Siebengebirge = volcanic mountain chain in the Rhine valley with approximately 40 peaks South-East of Bonn.

<sup>3</sup> Drawing after H. Möhl's work: *Der Scheidsberg bei Remagen am Rhein, Beitrag zur vulkanischen Entstehung basaltischer Gesteine und Fixirung unserer jetzigen Kenntnisse über die Zusammensetzung der Basalte*, published in vol. XIII of the publication *Bericht des Offenbacher Vereins für Naturkunde* (1870?).

<sup>4</sup> Râpa Roşie = Geological reservation of 10 ha, 3 km NE of Sebeş (Alba) is a high wall of ~ 100 m, with sculptural shapes (columns, towers, pyramids), on the right bank of the Secaş, shaped by torrents on a various substrate (gravels, quartz sands, sandstones).