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Development of geological studies in Lithuania: Imperatoria Universitas Vilnensis

Algimantas Grigelis

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After the third partition of the Polish–Lithuanian Commonwealth in 1795, the Lithuanian Main School underwent liberality and secularisation. In 1803, the structural reforms caused by the rapid development of science in Western Europe followed establishment of the *Imperatoria Universitas Vilnensis*. The General Charter of the Vilnius Education District reported that the University must have a full and systematised distribution of science. The emphasis on the mathematical and natural sciences increased, and ten top disciplines were taught in the Faculty of Physical Science and Mathematics. The self-dependent Mineralogy Department was introduced just also in 1803. Vilnius University became established as a well-funded and highly regarded institution of higher learning. Although the time-span of the University was rather short (1803–1832), – the University was famed for prominent professors, the high level of teaching, and students imbued with the principles of the Romantic Movement.

Key words: history of sciences, geology, mineralogy, Vilnius University, geological prospecting

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Algimantas Grigelis. Lithuanian Academy of Sciences, Vilnius, Lithuania. E-mail: grigelis@geo.lt

INTRODUCTION

In the early history of Lithuania's geological investigations, two basic concepts surfaced from the Medieval past. First, there were accomplished local masters and craftsmen who used to produce clay bricks and tiles, throw pots, use boulders for building castles, burn limestone or chalk to produce lime, knew the value of Baltic amber and Rudnia bog iron ore which was good even to forge Damask steel swords, and used Stakliškės mineral sources to get salt. All this practical knowledge passed from generation to generation, making important 'embryos' for later science. Second, there were chroniclers who worked for the sovereigns or the Church and described the main events of those times (i. e. political and economical life) and also described natural phenomena, including rocks, minerals or some interesting petrefacts. In 1570, the Jesuits came to Lithuania, and the works of educated monks replaced the chronicles. One such treatise was the *Historia naturalis curiosa Regni Poloniae, Magniducatus Lithuaniae* issued by Gabriel Rzączyński in 1721 in Sandomir (Rzączyński, 1721). The issue contains twenty chapters *(tractates)* describing the fauna, flora and *inanimate nature of Poland and Lithuania; salt springs of this land area are mentioned, too.*

ACADEMIA ET UNIVERSITAS VILNENSIS AND LITHUANIAN MAIN SCHOOL

In the eighteenth century, Antonio Skorulski[1] (in 1752–1755), Benedykt Dobszewicz[2] (in 1760–1763) and Joannes Chevalier[3]

[1] Anton Skorulski (1715–1780), doctor of free sciences and philosophy, theology and canon law, scholastic; expanded the course of nature philosophy, investigated astronomy systems and general physical elements: earth, water, air and fire, as well as described earthquake types, volcanoes, inanimate bodies (salts, stones, gemstones, metals and amber).

[2] Benedykt Dobszewicz (1722–?), doctor of free arts and philosophy, theology and canon law, examined nature philosophy; he was the first in Vilnius University who grouped nature sciences and introduced the terms 'geology', 'mineralogy'.

[3] Joannes Chevalier (1732–1780), doctor of free sciences and philosophy, theology and canon law, lectured ethics and philosophy, upholding views of Descartes about variability; he was inclined to explain geological phenomena by natural processes.

(in 1763–1773) gave lectures at the Vilnius University[4], divided natural philosophy into classes, confirming the differentiation of the sciences and their concepts (Plečkaitis, 1979; Paškevičius, 2003). In the second half of the eighteenth century, data about Lithuanian and Polish nature were presented in the well-known Alexander Buching's *Geographie* translated into Polish and Russian (Korolevstvo ..., 1775). The book contains some data on Lithuanian geology, amber from the Baltic coast, curative springs, iron ore, stone and gypsum; sinkholes known in Biržai region and getting around sixty foots in width are mentioned there.

One of the first authors to publish scientific information about the geological structure of the land surface in this region was the French botanist Jean Emmanuel Gilibert[5] who in 1781–1783 taught natural history and mineralogy to the Lithuanian Main School students in Vilnius (Vilniaus universiteto istorija, 1976) (Fig. 1). In 1780, in his report to Professor Pallas[6] in St. Petersburg Academy of Sciences, he added some remarks on Lithuania's mineralogy, saying, *"the land is covered with fine agate [i.e. quartz] sand"* (Gilibert, 1780; Fig. 2). This date may be considered to be the beginning of scientific geological ideas in Lithuania (Grigelis, 1979, 1981). After Gilibert, such famous scholars as Johann Georg Adam Förster[7], Stanisław Bonifacy Jundziłł[8], and Ferdinand Spitznagel[9] taught mineralogy at the Lithuanian Main School (Paškevičius, 2003).

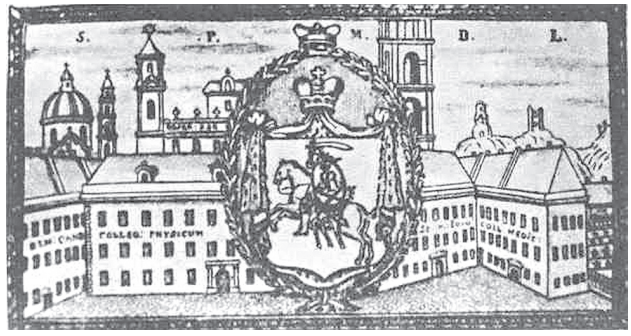
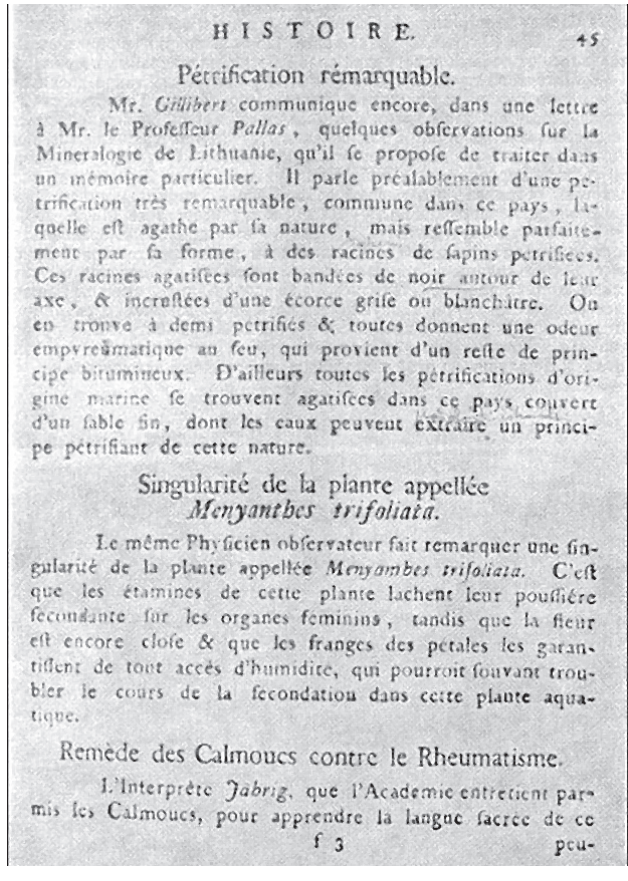


Fig. 1. View of Vilnius University in the 18th century
1 pav. Vilniaus universitetas XVIII a.



HISTOIRE. 45

Pétrification rémarquable.

Mr. *Gilibert* communique encore, dans une lettre à Mr. le Profeſſeur *Pallas*, quelques obſervations ſur la Mineralogie de Lithuanie, qu'il ſe propoſe de traiter dans un mémoire particulier. Il parle préalablement d'une pétrification très remarquable, commune dans ce pays, laquelle eſt agathe par ſa nature, mais reſſemble parfaitement par ſa forme, à des racines de ſapins pétrifiées. Ces racines agatiſées ſont bandées de noir autour de leur axe, & incruſtées d'une écorce griſe ou blanchâtre. On en trouve à demi pétrifiés & toutes donnent une odeur empyreumatique au feu, qui provient d'un reſte de principe bitumineux. D'ailleurs toutes les pétrifications d'origine marine ſe trouvent agatiſées dans ce pays couvert d'un ſable fin, dont les eaux peuvent extraire un principe pétrifiant de cette nature.

Singularité de la plante appellée *Menyanthes trifoliata.*

Le même Phyſicien obſervateur fait remarquer une ſingularité de la plante appellée *Menyanthes trifoliata.* C'eſt que les étamines de cette plante lachent leur pouſſiére fecondante ſur les organes feminins, tandis que la fleur eſt encore cloſe & que les franges des pétales les garantiſſent de tout accès d'humidite, qui pourroit ſouvant troubler le cours de la fecondation dans cette plante aquatique.

Remède des Calmoucs contre le Rheumatisme.

L'Interprète *Jabrig*, que l'Academie entretient parmis les Calmoucs, pour apprendre la langue ſacrée de ce

f 3 peu-

Fig. 2. Facsimile of J. E. Gilibert's first note on mineralogy of Lithuania (1780)
2 pav. J. E. Gilibert'o pirmojo pranešimo apie Lietuvos mineralogiją (1780) faksimilė

In 1784, writing about the Kuršas (Curonian) region, Jan Ferber, professor of Jelgava Gymnasium and a disciple of Carolus Linnaeus, mentioned north Lithuanian limestones, gypsum beds, and mineral water sources (Fischer, 1784). Saline water sources prompted the idea that salt could be extracted from them, and in 1787 the Lithuanian Main School professors Jozef Sartorius and Jozef Mickiewicz investigated saline sources along the Nemunas, while Stanisław Jundziłł determined salt content in Stakliškės mineral water (Jundziłł, 1792). At that time, investigations of saline sources, peat and bog ore deposits were important, since they had economic implications.

[4] The Academia et Universitas Vilnensis was established in 1579 by a privilege given of King Stephen Batory; since 1781 it was named a Lithuanian Main School (Main School of the Grand Duchy of Lithuania), and in 1803 – Imperial Vilnius University (Imperatoria Universitas Vilnensis).

[5] Jean Emmanuel Gilibert (1741–1814), doctor of medicine, naturalist, Montpellier University graduate, lectured in Lyons; in 1775, invited by Antoni Tyzenhaus came to Grodno and established a botanical garden and medical school there. In 1781–1783, he moved to Vilnius, where lectured nature history in the Main School, established a botanical garden (now Pilies St. 22) with about 2000 plant species. Published a five-volume treatise *Flora Lithvanica inchoata* (1781–1782). In 1783, came back to France. For some time he was Lyons' mayor.

[6] Petr Simon Pallas (1741–1811), academician, famous scientist and traveller, by 1767 became Head of Mineral Cabinet in the St Petersburg Academy of Sciences.

[7] Johann Georg Adam Förster (1754–1794), naturalist and traveller, in 1772–1775 together with his father took part in Captain's James Cook voyage around the world. Arrived to Vilnius from Kassel and replaced J. E. Gilibert, in 1784–1787 was professor at the Vilnius University Nature History Chair; established the Zoology Room. Within the nature history course he lectured mineralogy, botany and zoology. Having left Vilnius, he lived in Mainz, backed French revolution.

[8] Stanisław Bonifacy Jundziłł (1761–1847), naturalist, botanist, priest, studied in Vilnius, Vienna, Dresden, and Hungary. Philosophy doctor (1798), professor of Lithuanian Main School (from 1792) and Vilnius University in nature history and botany (1802–1824); reorganised the University Botanical Garden, was interested in geology, investigated mineral water springs, peat, prospected rock-salt and iron ores. Died in Vilnius.

[9] Ferdinand Spitznagel (1760–1826), medical man, Vienna University graduate, invited by the Rector Marcin Poczobut, lectured nature history in Vilnius University in 1792–1802, but he was not interested in scientific progress and neglected the botanical garden.

IMPERATORIA UNIVERSITAS VILNENSIS

The turn of the 18th and 19th centuries marks considerable changes for the Lithuanian Main School. After the third partition of the Polish–Lithuanian Commonwealth (*Rzeczpospolita Obojga Narodów*) in 1795, the Lithuanian Main School underwent liberality and secularisation, both formal and internal structural reforms. First, in 1797 under the so-called 'Repnin Reform'[10], three faculties (Physical Science, Medicine, and Ethics Science) were formed, replacing the earlier two faculties. A second reform followed on 4 April 4, 1803 under the *Ukaz* of Russian Tsar Alexander I, with the establishment of the *Imperatoria Universitas Vilnensis* as a temporal institution. The reform was caused by the rapid development of science in Western Europe, and prince Adam Jerzy Czartoryski[11], a favourite of Alexander I, was a considerable authority and contributed to the University's innovation. Czartoryski was appointed tutor of the Vilnius University; he was one of authors of the General Charter of the University and the Vilnius Education District, passed on 18 May 1803, reading that the University had to *'have a full and systematised distribution of science*'. The former three faculties then became four faculties: Physical Science and Mathematics, Medicine, Ethics and Politics, and Literature and Liberal Arts (Vilniaus universiteto istorija, 1977).

The reform in 1803 provided a strong incentive for the further development of Vilnius University, and the teaching programmes were significantly renewed. The emphasis on the mathematical and natural sciences increased, new disciplines were introduced and new professorships established. Ten top disciplines were taught in the Faculty of Physical Science and Mathematics, with ten professors to be employed in physics, chemistry, natural history, and botany, agriculture, advanced pure mathematics, advanced applied mathematics, theoretical astronomy, practical astronomy, and civic architecture. The conditions favoured a rapid development of university sciences. Thanks to Hieronim Stroynowski[12] who headed the University from 1799 to 1806, and especially to Jan Śniadecki[13] who was rector from 1807 to 1815, Vilnius University became established as a well-funded and highly ranked institution of higher learning. Although the time-span of the University was rather short (only 29 years, 1803–1832), the University was famed for prominent professors, the high level of teaching, and students imbued with the principles of the Romantic Movement and freedom of ideas, closely related to the society, with the recognition that education was of fundamental importance for the development of the country.

The self-dependent mineralogy discipline was introduced just during reforms in 1803 as a supplementary course in the natural history programme, at the Faculty of Physical Sciences and Mathematics (Grigelis, 2003; Narębski, 2003; Paškevičius, 2003). Mineralogy lectures were started in the same year; in 1804 the Mineralogy Cabinet (workroom) was established, with collections. At that time, mineralogy was already a popular discipline taught to naturalists, medicos, physicists, and chemists. Besides, the aristocracy were interested in mineralogy, and nobles wanted to possess collections of precious minerals. It was regarded as an honour to have them in the house. Fine minerals were also used in the church artwork (Grigelis, 2007b).

In 1803, the first mineralogy lecturer became Roman Symonowicz[14], a disciple of Abraham Gottlob Werner in *Bergakademie*, Freiberg, Saxony. Symonowicz earned fame by his 'mineralogical' travel in 1803 to Hungary and Transylvania, visiting the Szczawnica (Schemnitz) and Bystrica (Neusohl) ore deposits, the Kremnitz and Hronitz mints[15], and the Wieliczka[16] salt-mines (Grigelis, 2005). Rector Stroynowski took care of this travel, but he informed Curator Adam Czartoryski that Symonowicz was not well supplied with money[17]. Nevertheless, Symonowicz accomplished this trip and presented a detailed report in Polish to the Vilnius Imperial University Council[18]. Besides a detailed description of visited sites, Symonowicz noted an important role of mineralogical knowledge in Lithuania: "*... More than hundred students that attended my lectures on mineralogy, including twenty one who passed the exams, persuade the University that mineralogical knowledge in our country in a short time will become more popular than it has been so far. Many of them will study rock strata on the banks and valleys of our rivers, in order to satisfy various economic needs*".

Symonowicz published the first mineralogy handbook in Polish (1806) and compiled the first classification of minerals (Bogatko, 1815). He had in use one of the largest mineralogical collections of the Vilnius University–about 20 800 specimens, but the major part of this collection (12 643 specimens of minerals and rocks) belonged to him. This collection was considered by himself the fourth in Europe of that time, after Werner

[10] Nikolay Repnin (1734–1801), Duke, General, Russian statesman; after the third partition of the Polish–Lithuanian Commonwealth he was the first governor-general of Lithuania (1795–1797).

[11] Adam Jerzy Czartoryski (1770–1861), Duke, politician, adviser to Tsar Alexander I, in 1803–1824 Curator of Vilnius University and Vilnius Education District comprising eight gubernias.

[12] Hieronim Stroynowski (1752–1815), bishop, economist, lawyer, liberal-minded, one of the authors of the University reform; Rector of the University from 1799 to 1806, member of Florence Academy. Died in Vilnius.

[13] Jan Śniadecki (1756–1830), mathematician, astronomer, enlightener, Krakow University professor (1781–1803); in 1806 moved to Vilnius, lectured astronomy. Rector of the University from 1807 to 1815, member of the St. Petersburg Academy of Sciences. Died in Jašiūnai near Vilnius.

[14] Roman Symonowicz (1763–1813), born in Vilnius, doctor of philosophy and medicine, vice-professor of anatomy in the Lithuanian Main School (1797); since 1 September 1803, lecturer of mineralogy in Vilnius University, adjunct, organiser of Mineralogy Department (*VUB RS*, F2-KC3). Travelled in Transylvania, Hungary, Poland, studied in Freiberg, Saxony. Died in Vilnius on 29 January 1813.

[15] Present Banská Štiavnica, Banská Bystrica, Kremnica, Hronec, Slovakia, respectivelly.

[16] Wieliczka, near Cracow, Poland.

[17] Archiwum i Zbior Rękopisów, Biblioteka Książąt Czartoryskich, Cracow, *RKPS*, BCz, 6395 t. 2, l. 11–14 (22.06.1803), l. 15–17 (25. 06. 1803).

[18] Department of Manuscripts, Library of Vilnius University, *VUB RS*, F 2, KC 337, l. 1–5, 10. Translation from Polish.

in Freiberg, De Drée in Paris, and Van der Nulle in Vienna[19]. In 1810, Symonowicz wrote to the University Curator Adam Jerzy Czartoryski that the University should pay him additionally for the use of his personal collection at the public lectures on mineralogy and support its upkeep (Grigelis, 2007a). After Symonowicz's death, his brother Jacob sold the collection to the University for 10,250 Roubles in silver.

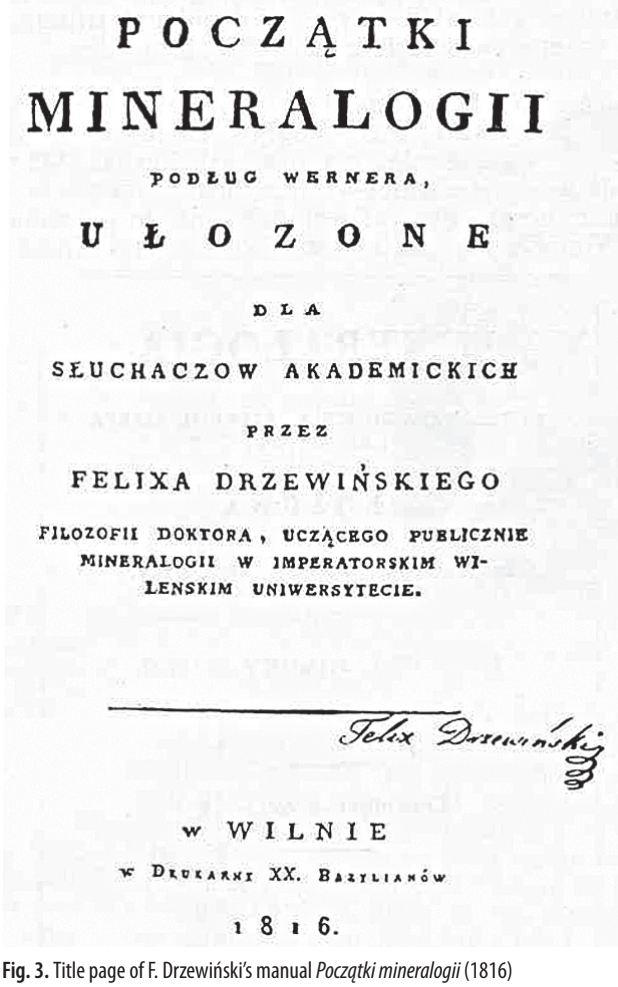
Roman Symonowicz's report to the University Council about his mineralogical travel, published nowadays in Lithuanian and in English (Grigelis, 2005, 2007a), shows Symonowicz's broad sophistication and scientific intelligence and, on the other side, specific features of metal deposits and stone-salt exploration in Central Europe. Symonowicz is called the pioneer of geological sciences in Lithuania (Grigelis, 1981).

TEACHING AND RESEARCH

The published and archival data show that from the very first day of its establishment, the Vilnius University Mineralogy Department was active in both teaching and research. The mineralogy taught there as a supplementary discipline from 1803 formed conditions favourable for the subsequent development of geological science in the Vilnius Education District. The University Council elevated this course to the rank of department in 1822, after the chair of mineralogy was approved.

Mineralogy was a popular discipline during the early period of Vilnius University (1803–1832) with such famous chemistry, physics and mineralogy professors, all graduates of Vilnius University, as Roman Symonowicz, Andrzej Sniadecki[20], Felix Drzewiński[21], Ignacy Horodecki[22], Joseph Jundziłł[23], Ignacy Jakowicki[24], and Karl Eduard Eichwald[25]. In his mineralogy handbook, Drzewiński (1816) mentioned the Grodno chalk, Upytė gypsum, as well as gneiss and granite boulders on the hills near Vilnius (Fig. 3).

The mineralogy lecturing at Vilnius University was at a high level, and the mineralogy manuals compiled by R. Symonowicz, F. Drzewiński and I. Jakowicki gave mineral classifications, descriptions and definitions (Fig. 4). The Mineralogy Department staff and alumni prospected for minerals, creating a scientific heritage with rich collections and a library, and many written sources (Grigelis, 2006). Unfortunately, the property of the Mineralogy Department (collections, library, etc.) was dispersed after the University was closed (in 1832), and the fate of the collections still remains almost unknown.



POCZĄTKI
MINERALOGII
PODŁUG WERNERA,
UŁOZONE
DLA
SŁUCHACZOW AKADEMICKICH
PRZEZ
FELIXA DRZEWIŃSKIEGO
FILOZOFII DOKTORA, UCZĄCEGO PUBLICZNIE
MINERALOGII W IMPERATORSKIM WI-
LENSKIM UNIWERSYTECIE.
Felix Drzewiński
W WILNIE
W Drukarni XX. Bazyliánów
1816.

Fig. 3. Title page of F. Drzewiński's manual *Początki mineralogii* (1816)
3 pav. F. Drzewińskio veikalo *Mineralogijos pradmenys* (1816) titulinis lapas

[19] Department of Manuscripts, Library of Vilnius University, *VUB RS*, F 2-KC 3, l. 264.

[20] Jędrzej Sniadecki (1768–1838), chemist, biologist, medical man, studied in Krakow, Padua, Edinburgh; professor of Vilnius University (1797–1832), one of the most prominent people of the Vilnius Enlightenment period. Died in Vilnius, buried in Jašiūnai beside his brother Jan Śniadecki.

[21] Felix Drzewiński (1814–1817), adjunct, doctor of philosophy, lectured mineralogy in 1814–1817, published a mineralogy manual (1816); in Paris he was improving his knowledge in physics (1817–1819), from 1823 he was Vilnius University professor in physics; from 1841 lived in Moscow and died there.

[22] Ignacy Horodecki (1817–1824), philosophy doctor, adjunct of chemistry, professor of mineralogy, graduate of Vilnius University where from 1800 he lectured physics and chemistry; from 1817 to his death in 1824 he lectured mineralogy; extraordinary professor of mineralogy (1823). Died in Vilnius.

[23] Joseph Jundziłł (1824–1825), master of philosophy, adjunct of botany and later professor of Vilnius University, Head of Botanical Garden; improved his skills in Germany, England and France, one year lectured mineralogy (1824–1825). Died in Vilnius.

[24] Ignacy Jakowicki (1825–1832), philosophy master, mineralogy adjunct, lectured mineralogy (from 1825); composed mineralogical manuals, took part in Eichwald's expedition in Volyn' and Podole. Died in Vilnius, buried in Bernardines Cemetery.

[25] Karl Eduard Eichwald (1795–1876), graduated from Dorpat (Tartu) University, studied in Berlin (1814–1817), Paris (1818), took a degree of doctor of medicine in Vilnius University (1819); worked in Dorpat, Kazan', took part in expeditions to the Caspian Sea, Caucasus, Azerbaijan, from 1827 professor of zoology and comparative anatomy of Vilnius University and Medico-Surgicial Academy (1827–1832–1838); he was an evolutionist, composed a three-volume handbook on *Zoologia specialis* (1829–1831), was interested in geology and palaeontology; in 1829 he organised the University's nature research expedition in Volyn' and Podole; in 1838 he moved to St. Petersburg. Member of the Russian Academy Science. Died in St. Petersburg.

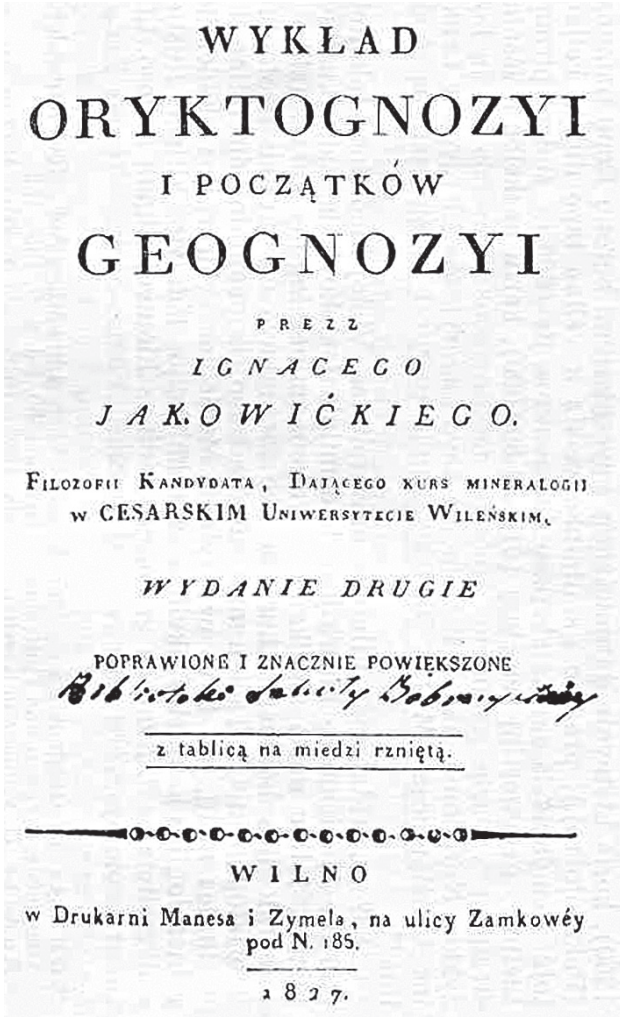

WYKŁAD
ORYKTOGNOZYI
I POCZĄTKÓW
GEOGNOZYI
PREZZ
IGNACEGO
JAKOWIĆKIEGO.
Filozofii Kandydata, Dającego kurs mineralogii w CESARSKIM Uniwersytecie Wileńskim.
WYDANIE DRUGIE
POPRAWIONE I ZNACZNIE POWIĘKSZONE
z tablicą na miedzi rzniętą.
WILNO
w Drukarni Manesa i Zymela, na ulicy Zamkowéy pod N. 185.
1827.

Fig. 4. Title page of I. Jakowicki's book *Wykład oryktognozyi i początkow geognozyi*, Second edition (1827)
4 pav. I. Jakowickio knygos *Geognozijos pradmenų ir oriktognozijos išdėstymas,* Antroji laida (1827) titulinis lapas

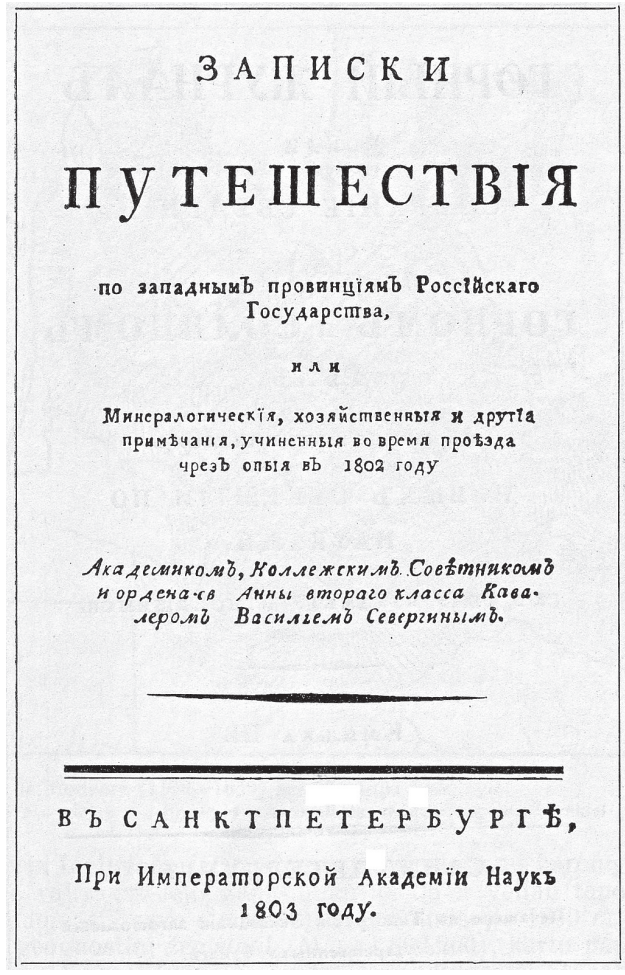

ЗАПИСКИ
ПУТЕШЕСТВІЯ
по западнымъ провинціямъ Россійскаго Государства,
или
Минералогическія, хозяйственныя и другія примѣчанія, учиненныя во время проѣзда чрезъ оныя въ 1802 году
Академикомъ, Коллежскимъ Совѣтникомъ и ордена Св. Анны втораго класса Кавалеромъ Василіемъ Севергинымъ.
ВЪ САНКТПЕТЕРБУРГѢ,
При Императорской Академіи Наукъ
1803 году.

Fig. 5. Title page of V. Severgin's book *Zapiski puteshestviya* ... (1803). [Travel notes ...]
5 pav. V. Severgino knygos *Kelionės užrašai*... (1803) titulinis lapas

GEOLOGICAL PROSPECTING

After the third partition of Rzeczpospolita in 1795, Lithuania's territory came under the rule of Tsarist Russia. At the beginning of the nineteenth century, the Russian Mining Department, based in St. Petersburg, appealed to the region's citizens and asked them to inform the local governments about salt sources. This was an attempt to encourage the prospecting of salt, coal, and iron ore deposits in the area. One of the first descriptions of the region's mineralogy was performed by the Academician Vasiliy Severgin[26] who in 1802 made a trip from St. Petersburg via the western region of the Russian Empire to the Siemiatycze estate of Countess Jabłonowska[27]. During this trip, Severgin recorded his observations on relief and soils and detected large boulder areas in the Vilnius region (Severgin, 1803; Fig. 5). In 1809, Alexander von Humboldt travelled by stagecoach along the Kuršių Nerija (Curonian Spit) from Berlin to St. Petersburg and described the legendary beauty of the Neringa 'sand kingdom' (Gudelis, 1959).

Most important, however, were attempts at geological prospecting for useful minerals. In 1825, Oberberghauptman Jan von Ulman carried out a geognostic review of the Vilnius, Minsk, and Grodno administrative regions, described the Papilė iron ore and limestone, the Biržai and Pasvalys gypsum with sinkholes [*karst. -AG*], as well as saline sources of Druskininkai, Stakliškės and Birštonas. He mentioned also that sediments [*orig. – 'nanosy'*] are widely distributed in this region and are as thick as 100–400 feet (Ulman, 1827). In 1828, the Papilė iron ore (Jurassic siderite in modern terms) was studied in detail by the geognost Kun, but the quality of ore was found to be poor

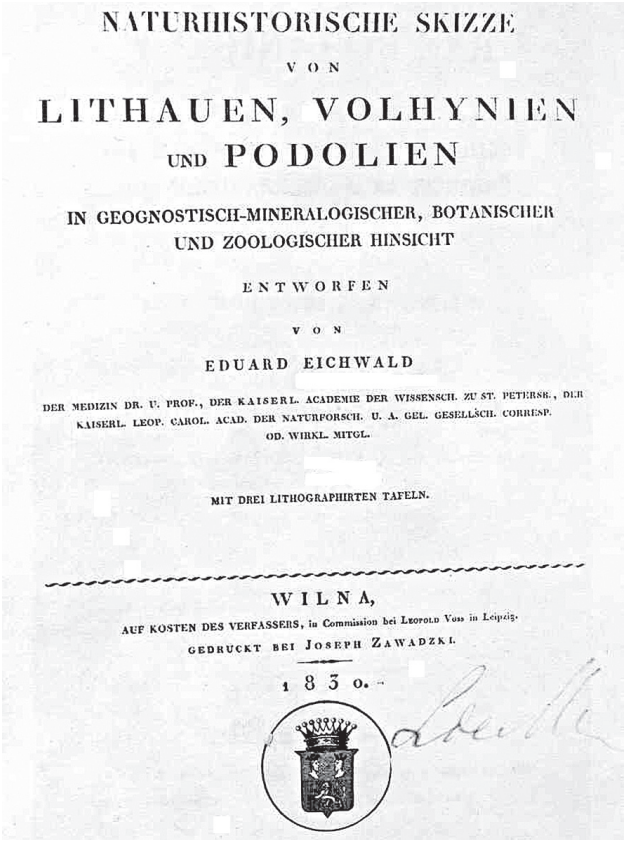
[26] Vasiliy M. Severgin (1765–1826), academician, naturalist, mineralogist, director of the Mineral Cabinet (1807–1826); was sent to Siemiatycze to take over Anna Jabłonowska's collections, which were packed by him and assistants in six weeks into 101 large packages and transported to Moscow University by 15 carriages drawn by four horses each.

[27] Anna Paulina Jabłonowska (1728–1800), Countess, a famous collector and sponsor, widow of Braclaw's wojewoda Jan Kajetan Jabłonowski (1699–1764). In her Siemiatycze (Eastern Poland, Podlasie district) estate, she had the zoology, mineralogy and botany collections, the richest in Europe, as well as works in physics, archaeology and numismatics. The prominent Polish naturalist Aleksander Sapieha is related to Siemiatycze (1773–1812). After her husband died, in order to cover debts to Russian treasury, Jabłonowska sold all scientific collections valued at 50 000 ducats. On 8 February 1802, Alexander I approved this contract and donated all the collections to Moscow University (established in 1755).

(iron made up 10–27%), and the idea to exploit the iron ore here was abandoned (Grigelis, 1981). In 1828, N. Dmitriyev wrote about the geology of Vilnius and its environs, with sand and clay strata being seen in numerous exposures, with underlying conglomerates in some places (Dmitriyev, 1828). Salt deposits were not found in the vicinities of saline (mineral) sources. However, chemical analyses of the Druskininkai mineral water revealed its curative properties (Fonberg, 1835), and the Druskininkai Spa was established in 1837 (Griškaitė, 2003). Mineral sources in Smardonė had previously been investigated by the talented chemistry scholar Theodor von Grotthus (1816)[28].

In 1829, Vilnius University organised a comprehensive geological–mineralogical–botanical–zoological expedition to Lithuania, Volyn' and Podolia, led by Eduard Eichwald (Eichwald, 1830*b*; Jakowicki, 1831; Fig. 6). The researchers described the Vilnius region geomorphology, the sandstone, tuff, and conglomerate exposures, mineral water resources; rock collections were made. In 1830, Eichwald also described finds of ammonites taken from Papilė exposures (Eichwald, 1830*a*). Many geological data were collected by Frederik Dubois de Montpereaux[29] (1798–1850), the agent of Baron von Ropp in Pakruojis, who described the geomorphology and useful minerals of the district and compiled the first geognostic map of Lithuania (Dubois, 1830). The age of rocks at that time was determined approximately by applying the Werner system (*Urgebirge*; *Übergangsgebirge*; *Flözgebirge*; *Aufgeschwemmte Gebirge*; Grigelis, 2003). However, the fossil fauna collections were sent to famous palaeontologists elsewhere. Leopold von Buch defined fossils collected by Dubois and Eichwald in 1830. After Eichwald's descriptions of ammonites, Georg Pusch[30] determined the Jurassic age of the Papilė exposures (Pusch, 1837), which was later confirmed by Leopold von Buch (1841). Papilė became one of the most famous Jurassic fossil sites in East Europe (Helmersen, 1841).

The geological set-up of Central and North Lithuania was described in detail by the famous 1841 expedition of Roderick I. Murchison and Eduard de Verneuil in European Russia and the Urals (Murchison, 1845; Murchison, Verneil & Keizerling, 1849). The Palaeozoic fauna collected during the expedition was described by Alexander Keyserling, and some identifications were made by Christian Pander, whereas Jurassic (Papilė) and Cretaceous molluscs were described by Alcide d'Orbigny (Murchison, de Verneuil & de Keyserling, 1845). However, the reference to *Pentamerus* limestone occurrence in Šiauliai environs was based on Silurian boulders, not on *in situ* finds. Describing the Quaternary rocks, Murchison referred to boulders, including granite, porphyry and other (Swedish) rocks, as well as Silurian limestone with corals and shells, observed on the hill slopes and tops (up to 200–300 feet) in the environs of Babtai Post Station (near Kaunas).


NATURHISTORISCHE SKIZZE

VON

LITHAUEN, VOLHYNIEN

UND PODOLIEN

IN GEOGNOSTISCH-MINERALOGISCHER, BOTANISCHER UND ZOOLOGISCHER HINSICHT

ENTWORFEN

VON

EDUARD EICHWALD

DER MEDIZIN DR. U. PROF., DER KAISERL. ACADEMIE DER WISSENSCH. ZU ST. PETERSB., DER KAISERL. LEOP. CAROL. ACAD. DER NATURFORSCH. U. A. GEL. GESELLSCH. CORRESP. OD. WIRKL. MITGL.

MIT DREI LITHOGRAPHIRTEN TAFELN.

WILNA,

AUF KOSTEN DES VERFASSERS, in Commission bei Leopold Voss in Leipzig.

GEDRUCKT BEI JOSEPH ZAWADZKI.

1830.

Fig. 6. Title page of E. Eichwald's report *Naturhistorische Skizze ...* (1830)
6 pav. E. Eichwaldo ataskaitos *Gamtos istorijos bruožai...* (1830) titulinis lapas

CONCLUSIONS

By the mid-nineteenth century, Devonian, Jurassic, Cretaceous and Tertiary rocks, as well as Ordovician and Silurian boulders had been described in Lithuania. Least attention was paid to the Quaternary: only hilly areas and a notable occurrence of boulders were reported. The drift hypothesis prevailed, and no Lithuanian observers up to that time deployed Agassiz's idea of the Ice Age to account for the occurrence of numerous loose boulders (erratics) in the region.

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[28] Theodor Christian Johann Dietrich von Grotthus (1785–1822), chemist, founder of electrochemistry, theory of electrolysis; was owner of Gedučiai manor in Biržai County and lived in it; in 1816 he published some data about the Smardonė spring water chemistry, determined the chemical elements that dissolve gypsum and how karst sinkholes are formed in Biržai environs.

[29] Frederik Dubois de Montpereaux (1798–1850), French naturalist and traveller, compiler of the first geological map of Lithuania (1830); later travelled in the Caucasus and other regions.

[30] Georg Gottlieb [Jerzy Bogumił] Pusch (1790–1846), born in Kohren-Salis in Saxony, studied in Bergakademie in Freiberg (since 1806), worked in Kielcy (1816–1826) and Warsaw (since 1826); author of the treatise *Polens Paläontologie* (1836).

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Algimantas Grigelis

GEOLOGIJOS TYRIMŲ RAIDA LIETUVOJE: *IMPERATORIA UNIVERSITAS VILNENSIS*

S a n t r a u k a

Po trečiojo Lietuvos-Lenkijos valstybės padalijimo Vyriausioji Lietuvos mokykla buvo liberalizuota ir supasaulietinta. Struktūrinių reformų, nulemtų sparčios mokslo raidos Vakarų Europoje, išdava – 1803 m. įsteigiamas *Imperatoria Universitas Vilnensis*. 1803 m. gegužės 18 d. patvirtintuose Vilniaus universiteto ir Vilniaus edukacinės apygardos Bendruosiuose nuostatuose skelbiama, kad universitetas privalo „turėti savyje pilną ir sistemingą mokslo išdėstymą“. Universitete stiprinami matematikos ir gamtos mokslai, dešimčia naujų disciplinų pasipildė Fizikos ir matematikos fakultetas. Nuo 1803 m. įtraukiama ir savarankiška mineralogijos disciplina; skaityti šį kursą pavedama adjunktui Romanui Simonavičiui. Vilniaus universitetas tampa gerai aprūpinta ir aukštai vertinama aukštojo mokslo institucija. Nors jis gyvavo visai neilgai (1803–1832), tačiau garsėjo įžymiais profesoriais, aukštu mokymo lygiu ir studentijos, persiėmusios romantizmo dvasia, laisvėmis.

Альгимантас Григелис

РАЗВИТИЕ ГЕОЛОГИЧЕСКИХ ИССЛЕДОВАНИЙ В ЛИТВЕ: ИМПЕРАТОРСКИЙ ВИЛЬНЮССКИЙ УНИВЕРСИТЕТ

Р е з ю м е

После третьего раздела Литовско-Польского государства главная школа Великого княжества Литовского подверглась либерализации и секуляризации. В итоге структурных реформ, обусловленных стремительным развитием науки в Западной Европе, в 1803 г. была учреждена *Imperatoria Universitas Vilnensis*. В Уставе Вильнюсского университета и Вильнюсского просветительского округа, утвержденном 18 мая 1803 г., провозглашается, что университет должен обеспечить полное и систематическое изложение наук. В университете усиливается значение математических и естественных наук, на Физико-математическом факультете вводится десять новых дисциплин. С 1803 г. вводится и самостоятельный курс минералогии, читать который поручается адъюнкту Романасу Симонавичюсу (Romanas Simonavičius). Вильнюсский университет становится хорошо оснащенной и авторитетной институцией высшего образования. Несмотря на то, что время существования университета было весьма непродолжительным (1803–1832 гг.), университет был известен выдающимися профессорами, высоким уровнем преподавания и свободами студенчества, проникнутого духом романтизма.