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BOTANY IN KRZEMIENIEC: PEOPLE, TEACHING, RESEARCH WORK

In Krzemieniec, a small Volynian town lying at the foot of a hill range called the Miodobory, there was an important botanical research centre, active in the years 1805–1831¹. Its development is related to establishing there an innovative school, Volynian Gymnasium [a secondary school], and later Volynian Lyceum [an upper secondary school] by Tadeusz Czacki². Botanical research work carried out in Krzemieniec developed and flourished thanks to three distinguished biologists employed as natural history teachers, namely Franciszek Scheidt (1759–1807), Wilibald Besser (1784–1842) and Antoni Andrzejowski (1785–1868). Their teaching activity, establishing and excellent managing of the Botanical Garden, as well as their floristic research in the southern parts of Polesie, Volyn, Podolia and the regions adjacent to the Black Sea (the so-called Poberezhje) are a significant and imperishable contribution to the world science³. In European botany the period of the activity of the Krzemieniec biologists was the time of intense physiographic research, exploring remote lands, great colonial expeditions, usually accompanied by a *naturalist* – a biologist studying the local flora and fauna, as well as geology and climate – and it was the time of the development of plant geography, initiated as a result of trips and research carried out by J. P. Tournefort (1656–1708), and, most notably, by Alexander von Humboldt (1769–1859), along with other scientists⁴. The research done by the Krzemieniec teachers was in line with this development tendency in botany. They appreciated the region

¹ Krzemieniec (Kremenets) – a town in the western Ukraine, now in the northern part of the Tarnopol province. In the period of school activity it belonged to the Russian Empire (the Volyn province). About 22,000 inhabitants live there now. The town is on the Ikva river ravine running across the range of limestone hills, called the Miodobory.

² M. Rolle, *Ateny Wołyńskie. Szkic z dziejów oświaty w Polsce*, Lvov 1898; L. Janowski, *W promieniach Wilna i Krzemieńca*, Vilnius 1823; M. Danilewiczowa, *Życie naukowe dawnego Liceum krzemienieckiego* in: *Nauka Polska*, 22, 1937, pp. 71–91; K. Bartnicka, *Programy nauczania w Wileńskim Okręgu Naukowym a szkoła krzemieniecka* in: *Kwartalnik Historii Nauki i Techniki* 29, 3/1989, p. 502; J. Chodakowska, *Gimnazjum i Liceum Wołyńskie w Krzemieńcu* in: S. Makowski (ed.), *Krzemieniec. Ateny Juliusza Słowackiego*, Warszawa 2004, p. 9; W. Grębecka, *Badania szaty roślinnej prowadzone w ośrodku wileńskim i krzemienieckim* in: J. Babcz, W. Grębecka (ed.), *Wkład wileńskiego ośrodka naukowego w przyrodnicze poznanie kraju*, Warszawa 1988, p. 115.

³ W. Grębecka, *Wilno – Krzemieniec. Botaniczna szkoła naukowa (1781–1841)*, Warszawa 1998, p. 288.

⁴ K. Magdefrau, *Geschichte der Botanik. Leben und Leistung grosser Forscher*, Stuttgart – Jena – New York 1992, p. 117.

where they happened to work, the beauty of the wildlife and botanical richness, especially because the riches had not been systematically analysed by professional biologists. In one of his reports summarising his research work Wilibald Besser described these places as characterised by abundance and variety of plants. Moreover, he emphasised that the vicinity of Krzemieniec, due to varied land forms and soil types, was a place promoting development of many floral forms. He stated that near Krzemieniec characteristic floral species could be found on every mountain (*in this region any hill is called a mountain*). Besser also stated (the remark was based on his research work, carried out for many years) that the whole region of Poberezhie, and especially the areas stretching between Savran, Balta, Rashkov and Jaorlik, as well as the whole Dniester River valley might be regarded as the El Dorado for Polish botanists at that time (i. e. in the early 1800s) and for many more years¹. Besser – born in Innsbruck, brought up in Lvov and educated in Cracow – would pay a tribute to the beauty of Krzemieniec and the richness of the wildlife in this region in his letters and papers on numerous occasions.

The Krzemieniec botanists

Franciszek Scheidt

The first natural history teacher came to Krzemieniec from Cracow². Brought up in an affluent bourgeois Cracow family, he was a son of Paweł Scheidt and Elżbieta, *née* Szulc. The would-be scientist was born in Cracow, on April 2, 1759. It was there that he received a thorough education, finished the Nowodworska college and then graduated from the University of Cracow. In 1779, Scheidt received the doctor's degree and started his professional life as a chemistry teacher at Szkoła Wojewódzka in Lublin. His scientific career was long and successful. The school where he taught had already been reformed in accordance with the principles set up by the National Education Commission [Komisja Edukacji Narodowej]³ and had introduced a new curriculum of natural sciences. F. Scheidt belonged to the generation of lay teachers who in the process of their upbringing and education were influenced by the reforms introduced by the National Education Commission and in their whole

¹ W. Besser, *Zapis botaniczny Pana Bessera* in: *Pamiętnik Farmaceutyczny Wileński* 1/1821, p. 97.

² M. Berganzoni, *Rzecz czytana o Franciszku Scheidt przez (...) Członka czyn[nego] Towarz[ystwa] Król[ewskiego] Warsz[awskiego] Przyjaciół Nauk dnia 30 kwietnia r. 1818 na publicznym posiadzeniu tegoż Towarzystwa*, occasional print; W. Hubicki, *Franciszek de Paula Scheidt, pionier teorii Lavoisiera w Polsce* in: *Księga Pamiątkowa dziesięciolecia Uniwersytetu Marii Curie-Skłodowskiej w Lublinie*, Lublin 1959, pp. 49–74; W. Grębecka, *Historia naturalna w Liceum Krzemienieckim* in: *Analecta, Studia i Materiały z Dziejów Nauki 1*, 1/1992, pp. 139–189; W. Grębecka, *Księgozbiór Franciszka Scheidta (1759–1807)* in: *Kwartalnik Historii Nauki i Techniki* 48, 3–4/2003, pp. 79–93; M. Creppe, *H. Wereszczycka, a biography* in: *Polski Słownik Biograficzny* 146 [thereafter referred to as *PSB*], Warszawa – Kraków 1994, p. 437; E. T. [Elżbieta Turczyńska], *Słownik biologów polskich* [thereafter referred to as *SBP*], Warszawa 1987, p. 477.

³ The commission established by King Stanisław August Poniatowski in 1793, whose aim was organising the system of state education in the Republic of Poland; see A. Jobert, *La Commission d'Education Nationale en Pologne (1773–1794). Son œuvre d'instruction civique*, Paris 1941 (Polish translation by M. Chamcówna: Wrocław – Warszawa 1979); J. Buba, *Współpraca Pijarów z Komisją edukacji narodowej* in: I. Stasiewicz-Jasiukowa (ed.), *Pijarzy w kulturze dawnej Polski*, Kraków 1982, p. 104.

professional lives clung to the ideas of the Commission and its programmes. He taught chemistry and natural history, and was a follower of the theory presented by Lavoisier (1743–1794), and introduced new teaching methods. Scheidt was famous for the experiments carried out during his chemistry lessons, making his lectures more accessible. He also demonstrated chemical processes in public lectures which he used to familiarise his listeners with new chemical principles stemming from the theories presented by Lavoisier. The lectures, widely attended, brought him recognition and allowed him to break the resistance of conservative public opinion that he had faced during his first years in Lublin. When teaching botany, Scheidt introduced some elements of plant morphology and physiology, devoting much time to the flower structure and plant reproduction. It was a result of the classification systems that were used at that time, which were based on the flower structure, especially of the system introduced by Carl Linnaeus (1707–1778). In order to continue their education, students had to be familiar with the systems. Scheidt also introduced some elements of general biology, like a definition of life, as well as definitions of plant and animal beings, or a definition of natural history and its categories. Scheidt's curriculum can be analysed thanks to the programmes of annual student performance festivals and student requirements¹.

After the Lublin episode Franciszek Scheidt moved to Cracow, where he taught first at a secondary school, and then at Collegium Physicum as associate professor and professor at the University of Cracow. He became a chemistry and natural history professor in 1790. He held the post until 1803, teaching chemistry and botany. The latter gradually took more and more time in his scientific activity. It was then that he started a close collaboration with Cracow naturalists, especially Jan Jaśkiewicz (1749–1809) and Jan Śniadecki (1756–1830). Scheidt travelled to Vienna twice, in 1797 and 1798, where he visited the Imperial Garden, the University Botanic Garden, as well as private botanical gardens, and discussed scientific issues with N. J. Jacquin (1727–1817), a renown botanist, director of the Imperial Botanical Garden at Schönbrunn palace in Vienna (established in 1753). In 1787, Scheidt became director of the Cracow Botanical Garden. He worked as a professor and director of the garden until 1803, when he was dismissed by Austrian authorities, which was a result of the university Germanisation policy after the third partition of Poland². In 1805, Scheidt was offered a post in the Krzemieniec Secondary School by Tadeusz Czacki. Scheidt accepted the offer, moved to Krzemieniec, and started work teaching chemistry and a complete course of natural history, namely botany, zoology and mineralogy. In his botany curriculum, published in 1805, there were many elements of plant physiology, explained in chemical terms. Since he taught chemistry at the same time, his curriculum showed that from the beginning of the 19th century biological sciences acquired a new position in natural sciences. The connection between

¹ W. Grębecka, *Wilno – Krzemieniec*, pp. 29–31.

² J. Kołodziejczyk, *Nauki przyrodnicze w działalności Komisji Edukacji Narodowej*, Warszawa 1936, p. 78; A. Piekielko, *Historia Ogródu Botanicznego Uniwersytetu Jagiellońskiego w Krakowie*, Warszawa – Kraków 1983, pp. 13–16.

natural history and earth sciences was obvious, and links between chemistry and natural history emerged as a result of progress made in both chemistry and plant physiology, and were just being discussed. Scheidt prepared a course full of elements of the so-called physiological chemistry, but at the same time he did not neglect classic departments of natural history¹. He also established a botanical garden in Krzemieniec. Thanks to very ambitious organisational and financial initiatives of Czacki, Scheidt was able to create a garden that resembled a university botanical garden both in its shape and scope. He also planned to study local plant species. It is indicated by archival notes concerning Scheidt, including a contract with a painter who was to document the floristic discoveries made, as well as Czacki's request directed to the gentry and civil servants from the neighbourhood, in which he asked them to make a preliminary research in the region in order for the professor coming from abroad to make a right decision as to how to organise his trip². Scheidt's ambitious plans were interrupted by his death in 1807. He died in Krzemieniec and was buried there, leaving good memories for those left behind. During the two years spent by him in Krzemieniec he was recognised as an outstanding naturalist and a good partner to work with. Tadeusz Czacki recalled him as a person *loved by all of us*.

Franciszek Scheidt left an impressive library³. A bibliophile, he had collected books from his early student years in Cracow, and then in Lublin, being a teacher. His library was compared with the best collections of Cracow naturalists, belonging to Śniadecki or Jaśkiewicz. Scheidt's book collection, bought by the Volynian Gymnasium, enriched the beautiful Krzemieniec library (it possessed, amongst others, the collection of King Stanisław August Poniatowski) with many volumes concerned with all natural sciences, including chemistry, zoology, mineralogy and geology. There were as many as 67 books on botany only, including beautiful and valuable old prints as well as classic works and the latest research reports. Paweł Jarkowski, the Gymnasium librarian, was proud of the purchase. In one of his reports he described it as a valuable collection of important and pricey works. As for him, there were just a few works to be purchased in order to have a naturalist library suitable for both teaching at a high level and the research work⁴.

Franciszek Scheidt arrived in Krzemieniec with a group of professors from Cracow. He brought to a new school the Enlightenment traditions of this

¹ W. Grębecka, *Wilno – Krzemieniec*, p. 105, pp. 189–190.

² *Kontrakt między Scheidtem a Sapalskim malarzem (z d. 17 V 1805 w Krakowie)* in: *Szkoły krzemienieckie*, vol. 4, sheet 759, manuscript 3444, the Czartoryski Library; *Pytania od Tajnego Konsyliarza Wileńskiego Uniwersytetu i Warszawskiego Towarzystwa Przyjaciół Nauk członka, Jeneralnego Guberniów Wołyńskiej, Kijowskiej i Podolskiej wizytatora i kawalera Tadeusza Czackiego JJWW Powiatowym Marszałkom i Chorażym, tudzież Sądóm Niższym i wszystkim właścicielóm dóbr w tychże Guberniach, do ułatwienia podano, dan w Brusilowie 5 stycznia 1805 r.* (occasional print).

³ W. Grębecka, *Księgozbiór Franciszka Scheidta (1759–1807)*; J. Pachonński, *Drukarze, księgarze i bibliofile krakowscy. 1750–1815*, Kraków 1962, p. 137.

⁴ P. Jarkowski, *Wiadomość o bibliotece Liceum Krzemienieckiego i onejże porządku udzielona przez jej bibliotekarza (...) Joachimowi Lelewelowi, roku 1825*, a manuscript published by M. Danilewiczowa in: *Rocznik Wołyński* 4, 1935, p. 8.

scientific centre and experience of a scientist who had been a director of a botanical garden for many years and an academic teacher giving lectures on natural science. His illness and death put an end to the work he had started, but Tadeusz Czacki put his effort into making sure that those ambitious beginnings would be continued. Wilibald Besser, a young doctor from Cracow, conducted studies in all the areas that his predecessor had researched. He modernised the curriculum, rearranged the collection in the botanical garden and continued floristic research. Together with his assistant Antoni Andrzejowski, Besser made impressive achievements. They were able to act swiftly as the organizational base had already been laid. They continued the studies started by Scheidt, making Krzemieniec a significant point on the map of the research focused on European flora.

Wilibald Besser

Wilibald Besser's links with Krzemieniec, both organisational and emotional, were exceptionally strong¹. He worked in the gymnasium, and then in the lyceum for a long time and it was not his own will to leave Krzemieniec. He departed for political reasons when the Volynian Lyceum was closed, and his beloved work, the botanical garden, was moved to Kiev.

Wilibald Besser was an Austrian, born in Innsbruck on July 7, 1784. His parents, Samuel Gottlieb Besser and Josepha von Lansenhoffer, died during an epidemic, when their son was 14. He was then brought up by his uncle, Suibert B. Schivereck (1742–1806), a professor of botany at the University of Lvov. It was there that Besser completed a secondary school education and started studying medicine. When the University of Lvov was closed by the Austrian authorities, they both moved to Cracow (in 1805). Besser graduated from the University of Cracow, received the doctor's degree in medicine (1807) and started working in a clinical hospital in Cracow. In his school and university years he actively pursued his interest in botany, making numerous trips in the vicinities of Lvov, and then Cracow, to the Polish Carpathians and foothills adjacent to this range. After Schivereck's death Besser continued exploring the areas, guided by Joseph Schultes (1773–1831), who took over the chair of natural history at the University of Cracow. Besser owed very much to his Cracow years. His botanical research in the vicinity led to preparing a two-volume work on Galician flora, *Primitiae Floreae Galiciae utriusque*². He inherited his uncle's plant collection and completed it with many samples which he found himself. It was the basis for the impressive collection of Besser. During his whole stay in Volyn he constantly exchanged letters with J. Schultes, and later with his son.

¹ A bibliography of biographical notes on W. Besser is huge. They are quoted by W. Grębecka in: *Badania szaty roślinnej ...*, pp. 119–120. The most important are the following: R. Trautvetter, *Żywot uczony Radcy Stanu G. Bessera* in: *Tygodnik Petersburski* 23, 1852, part 45; J. Kołodziejczyk, *Wilibald Besser* in: *Ziemia* 10, 1925, pp. 10–12; J. Wysztyński, *Besser (S. J. G.)* in: *Biblioteka Warszawska* 1845, pp. 17–21; W. S. Ikonnikov, *Biograficheskij slovar'*, Kiev 1884, pp. 38–43; an extensive bibliography of Besser's works is given in: S. Kościński, *Słownik lekarzów Polskich*, Warszawa 1883; W. Grębecka, *Wilibald Besser (1782–1842)* in: *Krzemieniec. Ateny ...*, p. 404.

² W. [S. J. G.] Besser, M. D., *Primitiae florum Galiciae austriacae utriusque. Encheiridion ad excursiones botanicas concinatum* (...), Viennae 1809, vol. 1–2, p. 460, p. 480.

In 1808, Besser was offered a job in Krzemieniec by Tadeusz Czacki, who looked for a suitable person to replace F. Scheidt. Besser accepted the offer, though it was a major change in his life, as he had to resign from his Austrian citizenship to become a Russian subject. The young botanist employed by the gymnasium started his career in an unusual way, making a trip abroad. Tadeusz Czacki meticulously listed Besser's responsibilities in his *Instruction to Mr Besser in Vienna* (every apprentice teacher was given such instructions)¹. Apart from getting in touch with the local scientific community, purchasing the latest publications to complete the Krzemieniec library, contacting a manufacturer producing educational visual aids (models of plant parts) and publishing his *Primitiae*, he was also obliged to get a command of Polish good enough to give lectures at school. Tadeusz Czacki's ambition was that only Polish should be used in the Volynian Gymnasium and he observed it very meticulously. Besser fulfilled all his obligations and in 1809 settled down in Krzemieniec which he later left only for scientific purposes, in order to make exploring trips. In 1818, he married Ludwika Falvienholz and had three children with her. In 1821, he left for Vilnius in order to have his medical degree recognised by Russian authorities². After getting his qualifications recognised in the Russian Empire, he took the responsibilities of a town doctor in Krzemieniec. In 1834, after the Volynian Gymnasium had been closed and the botanical garden moved to Kiev, he left for Kiev, where he taught a two-year course in botany, namely organography, terminology and plant physiology at the University of Saint Vladimir³. He retired in 1837, leaving the university. From that year on until 1841 he focused on taxonomical research, working in many botanical centres, including Berlin. In 1841, he returned to Krzemieniec, where he died on October 11, 1842, and was buried in the cemetery of the Basilian monastery. His scientific collection, including an invaluable plant collection, is stored at the Institute of Botany at the Ukrainian Academy of Sciences in Kiev.

In Krzemieniec, Besser worked as a botany and zoology teacher. The third branch of natural history, namely mineralogy, was not covered in his lectures, which had been provided in his contract. Instead, he took the managerial responsibilities of a director of the botanical garden, and he devoted much time to floristic research. (At that time mineralogy was becoming a distinct discipline and combining with geology⁴.) Besser constantly made his floristic research work, eventually becoming one of the greatest authorities on the flora of Volyn and Podolia, especially steppe plants belonging to the genus *Artemisia*. He was asked to help in classifying controversial species, and he

¹ *Instrukcja J. Panu Besserowi do Wiednia* in: *Szkoły krzemienieckie*, vol. 4, sheet 848, manuscript 3444, the Czartoryski Library.

² The degrees of graduates of universities of other countries were not valid in the Russian Empire. As Cracow belonged to Austria, Besser's degree in medicine did not allow him to work as a doctor.

³ W. S. Ikonnikov, *Biograficheskij slovar'*, p. 40.

⁴ [Czacki's contract with Besser] in: *Szkoły krzemienieckie*, vol. 4, sheet 857, manuscript 3444, the Czartoryski Library; J. Garbowska, *Nauki geologiczne w uczelniach Wilna i Krzemieńca* in: *Prace Muzeum Ziemi* 42, 1993, pp. 5–112.

published several papers based on updating European plant collections, including the Berlin collections¹. Wilibald Besser was a member of numerous scientific societies, both domestic and foreign: the Warsaw Society of the Friends of Science, the St. Petersburg Academy of Sciences, the Cracow Scientific Society, the Moscow Society of Nature Explorers, scientific societies in Leipzig and Berlin, and the London Garden Society.

He stayed in touch with European scientists, exchanging letters². His correspondence was numerous, and he exchanged letters with distinguished scientists, such as A. P. de Candolle (1778–1841), G. R. Treviranus (1776–1837), A. Thouin (1746–1824) and others. In the first period he presented the area of his research work and preliminary results. In the following years Besser discussed the most important scientific problems, exchanged collected specimens and opinions on new books.

The scope of the course in natural history taught in the Volynian Gymnasium is known thanks to the curricula, published yearly in Polish and Latin, as well as from the handbook *Natural History* [*Historia naturalna*]³. Besser taught a two-year course, divided into three parts: general biology (*On the Nature of Organisms*), zoology and botany. The course on botany was taught in spring in two consecutive years. The first part of the course planned in this way was devoted by Besser to the division of natural sciences, characteristics of plant and animal beings and the definition of life. Besser's views on the structure of natural life were close to those of Lamarck, especially in the case of the notion of the nature of a species and other systematic categories. The course in zoology was also focused on general issues. In a form of detailed tables, Besser presented a comparative characteristics of many classification systems put forward by European scientists of that period, including the classifications by Cuvier (1769–1832), Lamarck (1744–1829), Dumeril (1774–1860) and others. Besser also presented a table demonstrating the relationships between mammalian orders. He taught a course in palaeozoology and elements of human biology⁴. He did not, however, go into details of systematic zoology in his handbook, referring his students to Polish literature on that topic.

Besser's course in botany started with defining the goal and scope of the discipline and the place of plants in the living world, the definition of a plant and the criteria of dividing the plant kingdom into smaller categories. Using tables, he presented and compared the classification systems put forward by J.

¹ W. Besser, *Revisio Artemisiarum Musei Regni Berolinensis, cuius partem constituit Herbarium Vildenovianum* in: *Linnaea* 19, 1841, pp. 83–112; W. Besser, *Tentamen de Abrotis* in: *Mémoires de la Société impériale des naturalistes de Moscou* 9, 1832, pp. 3–92.

² *Protokół korespondencji botanicznej i zoologicznej nauczyciela zoologii i botaniki Liceum Wołyńskiego od 7 II 1819 do 30 IV 1821 i od 8 IX 1830 do 1833 r.*, manuscript, Jagiellonian University/PAN Library; J. Oleśzakowa, *Stanisław Bonifacy Jundziłł i Wilibald Besser w świetle wzajemnej korespondencji* in: *Studia i Materiały z Dziejów Nauki Polskiej* 21, 1971, B series, pp. 83–113.

³ *Historia Naturalna*, manuscript, Library of the Ukrainian Academy of Science. Archive, F. I. 6337, p. 456; W. Grębecka, *Wilno – Krzemieniec*, pp. 105–107, p. 190; W. Grębecka, *Historia naturalna w Liceum Krzemienieckim*, pp. 139–189.

⁴ W. Grębecka, *Historia naturalna w Liceum Krzemienieckim*, p. 150.

P. Tournefort, C. Linnaeus and A. L. de Jussieu (1748–1836). He presented these issues in a broad perspective of the history of biology, commenting on the progress made in botany from the time of Theophrastus (371–287). Besser regarded plants as an element of the general structure of the nature, a basis for the economics of the nature. They have a special position in the living world, as they are present in all kinds of environments on the Earth, and they are closely related to the inanimate world which creates places where living organisms find suitable conditions. Plants have always been the first manifestation of life in every new environment on the Earth occupied by living beings. Plants are necessary for animals to live, as they are their source of food. Moreover, as Besser emphasised very strongly, plants create habitats and produce oxygen. In the following part of the course in botany, having explained the general problems, Besser focused on organography (plant morphology) and elements of physiology and ecology. He stressed the plant diversity in different environments, which he analysed, taking coastal halophytes as an example. He demanded very good knowledge of biological systematics and plant species from his students, and he expected them to study contemporary literature. The list of mandatory readings was divided into two groups. There were books that all his students had to read, and titles to be read by those more interested in botany. The list of elementary titles included botanical handbooks by Polish authors (K. Kluk and S. B. Jundziłł), as well as Linnaeus' *Philosophia botanica* and works by J. P. Tournefort and K. L. Willdenow. The advanced students were expected to study books from a short list of the publications on the most important regional floras, such as *Flora rossica*, published by Peter Pallas in the years 1784–1788, *Flora Germaniae* by Heinrich A. Schrader (1796), *Flora Boëmica inchoata* by Franz W. Schmidt (1793–1794), and *Descriptiones et icones plantarum rariorum Hungariae* by Franz A. Waldstein and Paul Kitajbel (1802–1812)¹. It is worth mentioning that many of the works that Besser had at his disposal came from Scheidt's library.

Wilibald Besser continued the tradition of developing an ambitious school offering high quality teaching. His students were taught an interesting course, thanks to which graduates were able to continue their education at any university or pursue their interest in botany doing self-study work.

Apart from teaching, Besser was active in the field of floristic research. His work contributed largely to describing and classifying the poorly known flora of the south-western part of Eastern Europe. Besser organised a network of cooperating teachers who sent him plants collected in many places not known to him in the vast region of the Vilnius Scientific Department². He prepared for them *Rules concerning preparing plant collections* [*Przepisy do układania zielników*], published in Vilnius in 1826, and the collaborating teachers received professional care from him. Thanks to that system of work, schools gained didactical materials with appropriate descriptions, while Besser

¹ W. Grębecka, *Historia naturalna w Liceum Krzemienieckim*, p. 181.

² An administration unit in the educational system in the Russian Empire. Universities in an educational department (or school department, as they were also called) controlled the work of lower-level schools, primary and secondary schools.

was able to add new species to his plant collection¹. Besser was also memorised in a literary work of fiction. Antoni Andrzejowski, his collaborator, wrote a work in verse, dedicated to Besser, in which he listed his competences, showing that he was the appropriate person to write *Polish Flora* [*Flora Krajowa*]².

Thanks to a wise decision made by Tadeusz Czacki an extremely talented scholar came to the school in Krzemieniec. Working as a humble secondary school teacher, Besser carried out research work that contributed largely to describing the flora of the whole Europe. Well-known and recognised, corresponding with numerous scholars, Besser contributed to increasing the importance of Krzemieniec both in Poland and abroad.

Antoni Andrzejowski

Antoni Andrzejowski, who cooperated with Besser for many years and accompanied him in his trips, was the first botanist in Krzemieniec that was born in Volyn and at the same time the first one who learnt in the Volynian Lyceum³. He loved his country and the region where he had been brought up, knew its inhabitants and their customs, and knew how to use them in his work and how to collect the money necessary to achieve his aims, namely to organise serious scientific trips. It was even more valuable thanks to the fact that Andrzejowski was mainly a traveller and a physiographer, and the acquaintances and friendships made in his childhood and during adolescence, the period of care received from his father's sponsors, friends or employers, as well as from leading amateur naturalists, such as Aleksander Chodkiewicz (1776–1838), helped him in exploring those poorly known areas. Andrzejowski could find friendly people everywhere and he was remembered as such by his contemporaries and later recalled⁴. It is little wonder then that he found his place in the world just in Krzemieniec. In spite of its originality, the school was an emanation of the contemporary world of the Eastern Polish borderlands, referred to in Polish as Kresy. Andrzejowski, despite many turns in his life, was undoubtedly closely bound to Krzemieniec until the school was closed, and had exceptional respect for Tadeusz Czacki.

¹ J. Oleszakowa, *Współpraca Wilibalda Bessera z nauczycielami szkół podległych Liceum Krzemienieckiego*, manuscript, a paper presented at a conference on 14 March 1985, devoted to the 200th anniversary of W. Besser's and A. Andrzejowski's births (the conference of the Team of History of Botany at the Institute of History of Science); W. Grębecka, *Wilno – Krzemieniec*, pp. 134–135.

² A. Andrzejowski, *Do Wilibalda Bessera Dokt[ora] med[ycyny] nauczyciela zoologii i bot[aniki] w Liceum Wołyńskim, ważnych instytucjach członka, zachęcając do napisania „Flory Krajowej”* in: *Dziennik Wileński* 1821.

³ Biographical notes devoted to A. Andrzejowski were published in Polish and Russian. Most of them are listed in: W. Grębecka, *Badania szaty roślinnej ...*, pp. 119–120. The most important are: E. Berezowska, *Antoni Andrzejowski* in: *Ziemia* 4, 1913, pp. 278–281; F. Rawita-Gawroński, *Kilka słów o autorze i jego pamiątkach*, in: A. Andrzejowski, *Ramoty starego Detiuka o Wołyniu*, Vilnius 1921, vol. 1–3; M. Danilewiczowa in: *PSB* 1, p. 111; W. Grębecka, *Antoni Andrzejowski (1785–1868)* in: *Krzemieniec. Ateny ...*, p. 412. As for the Russian sources, important information was given in: W. S. Ikonnikov, *Biograficheskij slovar'*, pp. 19–23. The biographical notes can be completed with the set of documents gathered in the Central Historical Archive in Kiev (F. 707 and F. 710) and the set in the Archive of the city of Kiev (F. 16, op. 275).

⁴ [Anonymous] in: *Tygodnik Ilustrowany* 1860, p. 290.

Antoni Andrzejowski, a son of Łukasz and Katarzyna (*née* Sobińska), was born in 1785 in Warkowicze near Dubno. His early childhood was calm and safe in Volyn. Łukasz Andrzejowski was a cashier in Prot Potocki's bank, and then an independent farm tenant. This serenity and tranquillity was interrupted by the war of the years 1791–1793¹. Łukasz Andrzejowski joined the army, and his family evacuated to Galicia. In 1793, they returned to Volyn, totally bankrupt. From that moment on Łukasz Andrzejowski worked for influential Volynian aristocrats as a governor. Sometimes he acquired very high positions, e. g. he worked as a head court servant (*majordomus*) in the residency of the Walewski family in Tuczyn². Antoni Andrzejowski recalled this period of his life with great affection. He devoted much space to those years in his memoirs, titled *Ramoty starego Detiuka o Wołyniu*³.

In 1793, Andrzejowski started his education. He went to Korzec in Volyn, where his uncle, Kazimierz Sobiński, who worked in the Korzec tableware manufacturer as a painter and drawer, took him under his protection⁴. Young Antoni learnt some basics about painting from him, while he was taught general knowledge by a private tutor, Józef Skoczkowski, who taught several boys, including the sons of the head of the tableware manufacturer. Having returned from Korzec, Andrzejowski stayed with his family in the years 1796–1800. He was taught partly at home, and partly at school. He completed the fourth grade at a school controlled by the National Education Commission in Międzyrzecz Korecki. In his *Ramoty* he recalled his contacts with Franciszek Szopowicz, who had worked in Polish schools for many years. Szopowicz was promoted and appointed to the chair of mathematics at Szkoła Główna Koronna (the Principal School of the Realm; the University of Cracow). After the second partition of Poland, when the district was occupied by Austria, a part of the university staff got scattered. Szopowicz found himself in Volyn⁵. According to Andrzejowski, it was Szopowicz who taught him the basics of botany and inspired him with love for this part of the natural history, which enabled his further studies. However, the family situation hindered continuing the boy's education. In 1801 (on January 13) Łukasz Andrzejowski died. Further education of the young boy depended on the plans of his father's friends and at the same time Antoni's protectors.

In 1801, Andrzejowski left for Vilnius under the protection of Aleksander Chodkiewicz. There, he officially learnt painting from Józef Oleszkiewicz (1777–1830), while at the same time attended lectures given by Stanisław B. Jundziłł (1761–1847) on botany, Jędrzej Śniadecki (1768–1838) on chemistry, as well as by Jan A. Lobenwein (1754–1820) on anatomy. He was given refer-

¹ The Russian–Polish war in 1792 in defence of the Constitution of May 3.

² Tuczyn – a small town on the Horyń river.

³ Edited and published by Franciszek Rawita–Gawroński in 1914 in Vilnius, 2nd edition in 1921.

⁴ Korzec – a town in Ukraine (the Rowien district). In the late 1770s several manufactures were established there, e. g. of tableware and porcelain (set up by Prince Józef Czartoryski).

⁵ M. Chamcówna, K. Mrozowska, *Dzieje Uniwersytetu Jagiellońskiego w latach 1765–1850*, Kraków 1965, vol. 2, part 1, p. 107.

ence letters to the naturalists by Śniadecki. Andrzejowski had such a great passion for botany that he frequently visited the botanical garden in Vilnius. Professor Jundziłł, the director of the garden, took interest in the young plant passionate and even gave him some seeds. Jędrzej Śniadecki tried to persuade the young student to continue his education in Vilnius, but he decided to return to Volyn with his protector. The decisive factor might have been Andrzejowski's age, who did not feel secure in a strange city, far away from his native country. Moreover, the intellectual atmosphere permeating Vilnius in the age of Enlightenment did not suit the boy, who had been brought up in the conservative, patriarchal environment of Volyn. He commented on it extensively in his *Ramoty*. Still, he recalled his stay in the university centre for a long time after his return home and he did appreciate the scientific atmosphere of Vilnius.

Soon after his return the young naturalist became independent. As a painter, he designed decorations and directed plays staged by an amateur theatre, which were intended to add splendour to great family celebrations, held with much pomp and ceremony in Volyn. He used his botanical skills to catalogue plant collections or greenhouse tropical species. As he wrote in his memoirs, he had exchanged the seeds received from the Vilnius professor for books by Polish authors, e. g. K. Kluk and S. B. Jundziłł, whose work titled *Description of the plants growing wild in the province of Great Lithuanian Principality in accordance with the Linnean classification system* [*Opisanie roślin w prowincji W. X. Lit. naturalnie rosnących według układu Linneusza*], published in Vilnius in 1791 provided him with the first tool to classify plant species.

In 1806, Andrzejowski started education in the Volynian Gymnasium, attending lectures by Scheidt and Besser, widening his knowledge of botany, which was already impressive. Still, his education was not regular. He had to interrupt it from time to time to earn money. For instance, he spent the year 1808 in Zwardyńce in Podolia as a private tutor. In the periods of his absence from the gymnasium he kept in touch with Besser and the botanical garden, sending seeds and plants from the places where he was staying. Besser did appreciate the gifts as the specimens of plant species were collected at their natural sites, and on numerous occasions complemented Andrzejowski on his achievements and merits in his letters sent to his authorities and foreign scientists with whom he exchanged letters. Despite difficulties Andrzejowski finished the gymnasium and in 1810 started working as a drawing teacher assistant. Still, he did not hold the job for long. In 1814, he was dismissed as a person *suitable for the job, yet not diligent enough*. This somewhat harmful opinion about a very hard-working man was a consequence of his passion for botany. Undoubtedly, Andrzejowski neglected his duties, because he spent a whole spring, making botanical trips in the vicinity of Krzemieniec, sometimes with the school gardener. In 1818, he was employed again upon an urgent request from Besser, this time as botany and zoology teacher assistant. His responsibility was drawing plants in the school garden, so he found himself in the right place. By that time Andrzejowski had already made his first great trips and Besser could emphasise his merits in describing and classifying the plant species of Volyn and Podolia, as well as his skills of a pro-

fessional botanist¹. Andrzejowski frequently accompanied Besser in his trips and was his guide in the steppes. He knew every inch of the region, while Besser had been brought up in a mountainous and hilly region.

We may study the years of Andrzejowski's collaboration with Besser in Krzemieniec thanks to the letters exchanged with Jan F. Wolfgang (1775–1859), a professor of pharmacognosy in Vilnius and an outstanding botanist². The letters written in the years 1821–1830 reveal research ambitions of Andrzejowski, his intentions and plans, as well as the life of the botanists from Krzemieniec, the difficulties they had to face and the methods of work applied at the chair of the natural history.

In 1821, Andrzejowski went on a business trip to Warsaw. He was to get in touch, in order to start scientific collaboration, with zoologist Paweł Jarocki (1790–1865) and Michał Szubert (1787–1860), a botanist and director of the botanical garden at the university in Warsaw. The trip lasted a month. Andrzejowski learnt very much about Warsaw, visiting numerous places, and got acquainted with the cultural life of the capital, devoting much time to theatre. He was specially impressed by a meeting with Stanisław Staszic. Andrzejowski gave him a copy of his first scientific paper, which had been published in Krzemieniec, and discussed some corrections that should be introduced to the map prepared by Staszic, which he had used during his trip. He also brought many plants given by Szubert to the botanical garden in Krzemieniec. In the following years he was sent to take part in a scientific expedition organised by Karol E. Eichwald (1795–1876), a professor of zoology at the university in Vilnius. The expedition was made in 1829, and the results were published in the following year in a volume prepared in German and titled *Naturhistorische Skizze von Lithauen, Volhynien und Podolien*. The trip resulted in many controversies between the botanists both from Vilnius and Krzemieniec and Eichwald. The report, full of errors, was criticised vehemently in a competent review that Besser published in the *Flora* in 1832³.

In the years spent in Krzemieniec Andrzejowski concentrated on hard research work and serious scientific expeditions. He was a physiographer in a wide meaning of the term, as he studied zoology and geology as well. He collected entomological specimens and made some interesting observations on reptiles and amphibians during his trips⁴. Zoology remained in his focus also in later years, when he worked as an associate professor and custodian of the natural history collection in Kiev. He prepared a catalogue of the collection, titled *Catalogue des objets qui se conservent dans le cabinet zoologique de*

¹ W. Besser, *Prośba od nauczyciela zoologii i botaniki tudzież rządcy Ogródu Botanicznego Liceum Wołyńskiego*, Library of the Ukrainian Academy of Science. Archive, F. 707, op. 314; W. Grębecka, *Antoni Andrzejowski*, p. 415; W. Besser, *Raport przedstawiający na pomocnika Antoniego Andrzejowskiego i na malarza botanicznego Pawła Niedzielskiego*, the Vilnius University Library, F. 2–4 KC, sheet 171.

² A. Andrzejowski, *Korespondencja do Wolfganga 1821–1830*, Library of Lithuanian Academy of Science, F. 9, 154–155, sheets 1–66.

³ W. Grębecka, *Badania szaty roślinnej ...*, pp. 202–204.

⁴ *Gady i płazy nasze. Wyliczenie gadów i płazów, jakie w wędrowkach swoich po Guberniach Wołyńskiej, Podolskiej i Chersońskiej aż do Morza Czarnego dotąd uważał i rozoznał Antoni Andrzejowski*, Museum of Zoological Sciences at the Polish Academy of Science in Warsaw. Archive, manuscript.

*l'Université Impériale de St. Vladimir à Kiev, I^{ère} Partie: Mammifères, Oiseaux, Reptiles, Poissons et Crustaceea*¹. His geological research work was more professional. Andrzejowski was also interested in palaeozoology, especially in fossil snails from the Miocenic age, found in Volyn and Podolia. He prepared three publications on the fossils, describing 51 new species². As he was interested in palaeozoology, he also studied correlations between local geological formations and the plant types occurring in these areas.

In his scientific activity Andrzejowski did not focus solely on his trips and the research work related to them. From 1824, he taught botany in the lower grades of the lyceum, and in 1825 he published a botanical dictionary titled *Short dictionary of botanical terms, arranged in the alphabetical order to help in specifying plant species, or matching descriptions from the best authors* [*Nauka wyrazów botanicznych, dla łatwości determinowania roślin, czyli zastosowania do nich opisów z najlepszych autorów krótko zebrana i porządkiem abecadła ułożona*]. Another dictionary was prepared in collaboration with Besser and published under the title *The names of the plant species known to ancient Greeks, translated into Polish* [*Nazwiska roślin Grekom starożytnym znanych na język polski przetłumaczone*]³. Andrzejowski did also some taxonomic work. In 1818, his paper was published under the title *Czackia. A plant genus determined and described by Antoni Andrzejowski in Krzemieniec in 1818* [*Czackia. Rodzaj roślinny rozróżniony i opisany przez Antoniego Andrzejowskiego w Krzemieńcu 1818 r.*]⁴. Another paper on taxonomy was written by Andrzejowski many years later, in 1838, when he tried to obtain the doctorate in Kiev. The dissertation titled *Animalversiones in genera Orthoplocearum Brassicearum systematis naturalis vegetabilium Augusti Pyrami de Candolle* was highly appraised, but Andrzejowski did not obtain the degree. His theses, presented to public discussion, were too controversial and Andrzejowski was not able to defend them⁵.

After the Volynian Lyceum had been closed, Andrzejowski worked as an associate professor at St. Vladimir University in Kiev. As it has already been mentioned, he was a custodian of the Natural History Exhibition, and for a year he taught zoology. This period of his life was not interesting. In 1839, after the unsuccessful attempt to obtain the doctorate, he moved to the Nizhyn Lyceum of Prince Bezborodko, where he taught drawing and natural history⁶. Having retired in 1852, he left Nizhyn, and then lived first in Niemirów, and

¹ W. S. Ikonnikov, *Biograficheskij slovar'*, p. 20.

² J. Garbowska, *Antoni Andrzejowski jako geolog* in: *Kwartalnik Historii Nauki i Techniki* 29, 2/1989, pp. 261–269. The author also gave there a list of the most important papers by Andrzejowski on geology.

³ *Nauka wyrazów, przez (...) w Krzemieńcu i Warszawie 1925; Nazwiska roślin*, Vilnius 1827, a reprint of the material published in *Dziennik Wileński*.

⁴ *Pamiętnik Farmaceutyczny Wileński* 2, 4/1822, p. 588 – the paper was printed for the first time in a student periodical in Krzemieniec in 1818; Staszic was given a copy.

⁵ Archive of the city of Kiev, F. 16, op. 275; W. S. Ikonnikov, *Biograficheskij slovar'*, p. 21.

⁶ G. Lisienko, M. Szewera, *Naturalist Anton Andrzejowski: nizhynskiy period diyatielnosti* in: *Materialy konferencii molodich wczennich – botanikiv Ukrainii*, Nizhin 1999, p. 13. The article contains the most important documents concerning Andrzejowski's employment in the Lyceum.

then in Ilińce. He was employed as a botanist and gardener by Konstanty Plater. He continued completing his Ukrainian plant collection and still was an active florist. Andrzejowski was elected member of the Commission established in order to describe the School District of the Kiev Province. The body worked in the years 1851–1864. He published reports on his work on the Ukrainian flora in Russian, e. g. *Ischislenie rasteniy Podolskoy Guberni i smezhnyh s nieyo mest*¹.

Many scientific societies offered him membership, e. g. the Warsaw Society of the Fiends of Science, the Moscow Society of Nature Explorers, the Moscow Horticultural Society, the Odessa Horticultural Society and the Geological Society of Paris.

After leaving Krzemieniec he devoted much time to his family. His family life was not happy. He married Julia Rościszewska in 1830 and had two children, Andrzej and Anna. His wife died in 1860, and his daughter, who was very close to him, died in 1862. The life of his son, who also died at a young age, is not known. Andrzejowski was alone.

The last years of his life Andrzejowski spent at the court of Aleksander Branicki (1821–1877) in Stawiszczce in Ukraine, where he was employed as a gardener. It was a period of active research work. Andrzejowski also created a botanical garden of regional plants. The richness of the flora in this region impressed Andrzejowski, which is revealed in his correspondence². He was preparing a publication of a huge, two-volume work titled *Ukrainian flora, or description of plants growing wild in the preDnepr Ukraine and adjacent regions of Volyn, Podolia and Cherson Province* [*Flora Ukrainy czyli opisanie roślin dzikorosnących w Ukrainie przednieprowej i w sąsiednich z nią okolicach Wołynia, Podola i Guberni Chersońskiej*], using new specimens from his collection. He managed to complete the first volume, containing genus descriptions. The book was published after his death, in Warsaw in 1869. The material collected to prepare the second volume remained in Stawiszczce. Atanazy Rogowicz, a professor of botany at the Kiev University, with whom Andrzejowski exchanged letters and plant specimens, analysed the collection of Andrzejowski, courtesy of Branicki, and selected 278 rare and valuable species for publication. Some material, especially his notes made during field work, are collected in the archive of PAN/PAU in Cracow. The plant collections of Andrzejowski have got scattered.

Andrzejowski died in Stawiszczce on 12 December 1868 and was buried there.

¹ A manuscript copy, Central Archive of the History of Ukraine, F. 2224, op. 1 number 6.

² He wrote extensively on his research in Ukraine in his letters to Atanazy Rogowicz, a professor of botany from Kiev (letters written in the years 1865–1868, the Library of the Ukrainian Academy of Science, manuscript department, Rogowicz's correspondence), and he mentioned it in a letter to J. Aleksandrowicz, a botanist from Warsaw (a copy of letter from the collection of Hipolit Skimborowicz, Museum of Zoological Sciences at the Polish Academy of Science in Warsaw. Archive, 641, sheet 2); on his work in Stawiszczce see: R. Atanazy, *Dzieje rezydencji na dawnych kresach Rzeczypospolitej*, Wrocław 1997, vol. 11, p. 328.

Research trips made by scientists from Krzemieniec

The activity of the Krzemieniec botanists was not confined to their didactical and organisational work. Planning establishing a modern and revolutionary school in this town, Tadeusz Czacki had very ambitious goals. He wanted Krzemieniec to become not only a teaching centre of a level close to university level, but also a centre focused on research, including physiographic work. His plans were a result of his conviction that Polish science, which formerly rather adopted the effects of the progress made in European centres, should make a significant contribution. Czacki was of the opinion that the starting point should be a reliable physiographic description of the region that was not well known, namely it should be studying the geography, geology, flora and fauna of Polesie, Volyn, Podolia and the lands by the Black Sea. He presented his views in his *Request [Odezwa]*, which has already been quoted¹. And this was what he required from the botanists who were employed in the gymnasium, including Scheidt and Besser. Franciszek Scheidt could not take the task, but Besser shared Czacki's views. Having been taught by two outstanding botanists – J. Schultes, the author of the work on Austrian flora, and S. Schivereck, who studied the Carpathian flora² – he was convinced that a thorough analysis of the wildlife of the area where a naturalist happened to work, is *his primary responsibility*³.

Little wonder then that botany was a passion of Wilibald Besser. He was able to carry out this pioneer work thanks to working in a splendid region, his own conviction as to the meaning of his research and his skills learnt in Cracow. Besser made his research in vast areas, which he listed already in the title of his first book, published in Vilnius in 1822, containing the results of the work done in Krzemieniec – *Enumeratio plantarum Volhyniae, Podoliae, gub. Kiov[iensis] et Besarabiae cis tyraicae (...) et circa Odessam collectarum*⁴. It was not the first report published by the teacher from Krzemieniec. In 1820, in *Pamiętnik Farmaceutyczny Wileński* an extensive description of plant species found and identified, as well as a detailed physiographic description of the research area had been published under the title *A note by a teacher from the Lyceum in Krzemieniec (...) on the natural history in Volyn, Podolia, Ukraine and some closer regions [Zapis nauczyciela Liceum Krzemienieckiego (...) w przedmiotach Historii Naturalnej o Wołyniu, Podolu, Ukrainie i niektórych bliższych okolicach]*. Besser presented there the results of the three research trips that he had made: (1) to Grzymałów, (2) to Zaleszczyki, and (3) a long trip from Krzemieniec, *via* Humań and Bohopol to Odessa, and then back *via*

¹ *Pytania od Tajnego Konsyliarza ...*

² For information on Schivereck and Schultes see: L. Finkel, S. Starzyński, *Historija Uniwersytetu Lwowskiego*, Lvov 1894, p. 48, 103; A. Piekieleko, *Historia Ogrodu Botanicznego Uniwersytetu Jagiellońskiego w Krakowie*, Warszawa – Kraków 1983, pp. 16–18; D. W. Lebiediew, *Josif Szultes in: Oчерки по ботанической историографии XIX–начало XX в.*, Leningrad 1986, pp. 22–32.

³ W. Besser, *Raport przedstawiający na pomocnika Antoniego Andrzejowskiego i na malarza botanicznego Pawła Niedzielskiego*, the Vilnius University Library, F. 2–4 KC, sheet 171.

⁴ Vilnius 1822.

Balta and Tarnoruda to Krzemieniec. In his report Besser summed up the numbers of the plant species that had been discovered by then. It was also important to identify characteristic species of particular regions. Besser concluded that Volyn, Podolia and the Kiev province were very rich in characteristic species. He also compared the richness of the flora analysed by him to that in other regions of Poland. In the west of Poland there were 147 such species, 42 in Lithuania, 211 in Galicia, while as many as 472 in the *southern provinces*. Besser also gave the number of discovered cryptogamae plants, or cryptogams (mosses, ferns and fungi). A report prepared in this way was a prelude to his major work on plant geography. In 1821 he published *Botanical report by Mr. Besser [Zapis botaniczny Pana Bessera]*, and then the first part of his *Enumeratio*. Besser published his papers not only in the Vilnius periodicals. He also used to send short notes to the *Flora oder Regensburger Botanische Zeitung*, in which he informed about his discoveries¹. He also sent his reports to Russian periodicals published in French. The coda of his research made in Krzemieniec was a work on plant comparative geography – *A glance at physical geography of Volyn and Podolia [Rzut oka na jeografię fizyczną Wołynia i Podola]*. The work was published in two versions, in French in 1823 (*Aperçu de la géographie physique de Volhynie et de Podolie*), and in Polish in 1827². It was a pioneer work in Polish literature on wildlife, opening a new chapter in the botanical research in Poland, namely studying the plant geography. In the first part Besser presented a condensed and synthetic description of the physiography of both regions, especially of the land formations, geology and climate, as well as the characteristics of the local flora. The second part was *Table comparing Volynian and Podolian plants [Tablica porównująca rośliny wołyńskie z podolskimi]*. In order to make the comparison Besser employed the method of floristic and geographical analysis, and identified seven floristic elements in Podolia and Volyn, namely floras called Austrian–Pannonian, German, Italian, Eastern, Northern, Syberian and Taurid–Caucasian. He made lists of Volynian and Podolian plant species belonging to these floras and those occurring in both these regions, found during the research made by the Krzemieniec botanists. In order to write such a synthesis Besser, apart from field work, needed a plant collection as complete as possible. He had been collecting specimens for a long time, from his Cracow years. Apart from the plant collection that he inherited from Schivereck, he also gathered the plant collections received from amateur botanists, often from remote and forgotten areas in Galicia³. As it has already

¹ W. Besser, *Zapis Nauczyciela* in: *Pamiętnik Farmaceutyczny Wileński* 1, 1/1820, p. 139, p. 241; *Zapis botaniczny Pana Bessera* in: *Pamiętnik Farmaceutyczny Wileński* 2, 1/1821, p. 96; W. Besser, *Florae Volhyniae et Podoliae affinitatom cum Galicia, Pannonica et Tauro Caucasio* in: *Flora oder Regensburger Botanische Zeitung* 1, 1820, pp. 229–231; W. Besser, *Plantas nonnullas notabiliores. Androrandum resiculosam, Cauliniam novam, Alismatam natans, A. ranunculoides, A. parnassifolium in Lithuania delectas esse* in: *Flora* 4, 1821, p. 682.

² *Mémoires de la Société impériale des Naturalistes de Moscou* 6, 1823, p. 188; *Rzut oka na jeografię fizyczną Wołynia i Podola* in: *Dziennik Wileński. Umiejętności i Sztuki* 2, 1827, pp. 414–437.

³ W. Pol, *Muzeum natury we Lwowie. Historyczna wiadomość literatury nauk przyrodniczych w prowincji naszej – obraz naukowych podróży i zbiorów* in: *Biblioteka Naukowa Z–du im. Ossolińskich*, Lwów 1847, vol. 5, p. 445; W. Besser, *Enumeratio*, introduction.

been mentioned, in Krzemieniec Besser organised a collaboration of teachers, who sent him plants picked up in many parts of the vast Vilnius Scientific Department. He used a directive issued by the Ministry of Public Education, in which teachers were required to make scientific observations, and focused their efforts on his own research programme. The archive material enabled stating that Besser had been sent plant collections from Białystok, Minsk, Drohichyn, Zhytomierz, Mozyrz, Borysów, Neswez (Nieśwież), Słuck, Włodzimierz Wołyński, Świsłocz, Klewań, Kroże, Słonim, Międzybórz, Winnica, Vilnius, Iłkušta, Teofilów, Chłopienicze, Berezwezc and Poczajów. Some schools sent plant collections for many years. Besser received about 8,300 sheets with plants, thanks to which he was able to deepen his comparative analysis¹.

Equally important for understanding the physiography of these regions was the research made by Antoni Andrzejowski, who became an assistant of Besser in 1818, when he was employed by the gymnasium.

In the years 1814–1824 Andrzejowski made several large-scale trips in Volyn, Podolia, Polesie and Poberezhie. The result was a recognition of naturalists and reports that were the first thorough analyses of these areas. The title of the publication which was prepared as a report on the first five trips reveals the size of the studied area – *Botanical sketch of the areas explored during trips made between the Boh River and the Dniester, from Zbrucz to the coast of the Black Sea, in the years 1814, 1816, 1817, 1818, 1822 by Antoni Andrzejowski, a zoology and botany teacher assistant in the Volynian Lyceum* [*Rys botaniczny krain zwiedzonych w podróżach między Bohem i Dniestrem, od Zbruczy aż do Morza Czarnego, odbytych w latach 1814, 1816, 1817, 1818, 1822 przez Antoniego Andrzejowskiego, pomocnika nauczyciela zoologii i botaniki w Liceum Wołyńskim*]. The work was published in Vilnius in 1823. The trips made by Andrzejowski were usually sponsored by wildlife lovers: Waclaw Rzewuski, Filip Plater and Piotr Moszyński, which is confirmed by the dedication in the first edition of the work. The only trip that Andrzejowski financed himself was the one made in 1817. In 1822, he received funds from the university². Andrzejowski used his contacts not only to find sponsors, but also to organise the work in the thinly-populated areas. He used to stay at his friends' and used their houses as bases for the most interesting field research and labs. He received an award from the Vilnius University for his first report. He went again to the region in the years 1823 and 1824, confirmed his geological observations and finally made up a hypothesis concerning plant distribution depending on the geological substratum. The results were published by him in the daily *Dziennik Wileński. Umiejętności i Sztuki*. The title was similar – *Botanical sketch (...) made in the years 1823 and 1824* [*Rys botaniczny (...) odbytych w latach 1823 i 1824*]. A copy of the report was printed

¹ J. Paczoski, *O formacjach roślinnych i pochodzeniu flory poleskiej* in: *Pamiętnik Fizjograficzny* 16, 1900, part 5, p. 10; W. Grębecka, *Wilno – Krzemieniec*, pp. 134–136.

² Vilnius 1823 (126 pages); in his dedication he mentioned his protectors: Prince Adam Czartoryski, Konstancja and Waclaw Rzewuski, Filip Plater, Piotr and Joanna Moszyński.

in Vilnius¹. Andrzejowski made his trips along river valleys, but also explored the areas stretching between them. He described the explored areas in a complex manner, which resulted in presenting new material, both botanical and geological, as well as new theoretical issues. As he started his descriptions of the valleys of the Boh and the Dniester almost from the areas surrounding the sources of the rivers, his conclusions concerned changes of the land formation and geology in a vast and changing area. The conclusions presented by Andrzejowski were even more valuable for the reason that he gave up a trip diary, which was a usual tool at that time, and attempted to make a synthetical analysis, one of the first physiographic analyses in Poland, and the first one in this region². A ten-year period (1814–1824) is long enough to detect significant changes, both geographical and ecological. Describing plants, Andrzejowski paid attention to changes in the plant species distribution depending on the geographical site and habitat, and he analysed differences between the plants growing in the river ravines and the nearby steppe, spotting a significant decrease in the forested area, especially in Volyn, which was a result of farming, as well as the gradual disappearance of many rare, beautiful plant species and their colonies³. The lists of plant species that Andrzejowski attached to the descriptions, which served as a basis for his conclusions, characterise the changes in the flora towards the south, to the coast of the Black Sea, and to the east, from the Dniester valley to the Don River. Andrzejowski did not try to present a complete list of plant species, but he described the plants occurring in the species set when moving to the south and the east, mentioning disappearing species, growing only in the north or in the west. Thanks to such observations he was also able to detect the differences in geology and botany between the great valleys of the Dniester and the Boh. The most original contribution made by Andrzejowski to theoretical science was establishing a connection between the species set occurring in a particular area and the geological substratum. He divided the area explored by him into six zones, depending on the presence of limestone or granite and the resulting plant species sets, which he called Floras. He showed the similarities and differences between the *floras* and identified the species characteristic for each of them. Such a description of the flora was a new idea in the physiography of that period. The first plant geographers sought for a connection between plant distribution and geographical conditions, temperature and soil types, but the dependence on the geological conditions had not been observed. It was also the first attempt of understanding and describing the fact of collective distribution of plant species and the factors influencing the distribution⁴. The trips made by

¹ A. Andrzejowski, *Rys botaniczny* in: *Dziennik Wileński. Umiejętności i Sztuki* 5, 1830, pp. 121–150, pp. 220–275; a reprint published in Vilnius in 1830.

² A. Andrzejowski, *Correspondence*, a letter from 1 November 1822, sheets 10 and 11. Wolfgang encouraged him to take this task, presented the issue to the authorities of the University, and wrote a laudatory introduction (*Przedmowa wydawcy*).

³ A. Andrzejowski, *Rys botaniczny* (1823), p. 61, mentions an unusual plant site in the village Kosy in Podolia.

⁴ Andrzejowski's ideas were highly assessed by geographer Wincenty Pol in: *Północny wschód Europy*, part 3, *Obrazy z życia i natury. Dzieła prozą Wincentego Pola*, vol. 2, Lwów 1876, p. 170.

Andrzejowski resulted in his fame and recognition by botanists, and the Botanical Garden in Krzemieniec received invaluable and numerous specimens. Already from his first trips Andrzejowski brought huge plant collections – in 1814 he brought plants belonging to 96 species¹, and in 1816 plants of 210 species¹.

The botanical garden in Krzemieniec

The garden was established in 1805². The garden plan was prepared by an outstanding gardener, Dionizy McClair (the Polish version of his surname, Mikler, was commonly used), famous for park architecture achievements in the eastern Poland³. Franciszek Scheidt was responsible for the scientific care of the garden. It was not him, however, but Wilibald Besser, who managed to raise the Volynian Lyceum garden to the level of a centre that could match university gardens not only in Vilnius or Cracow, but in the cities of the whole Europe. Tadeusz Czacki secured a wonderful start. In the years 1805–1809 Mikler brought plants from many countries, including Russia, Finland and Great Britain⁴. The result was that in the garden there were collections of great value, both educational and aesthetic. In the period of Besser's management the garden lost the character of a park and gained the status of a scientific and educational centre. Besser rearranged the plant collections in order to match the plant distribution and educational purposes, creating departments of systematics, plant biology, neighbouring plant collections, exotic plants and rare species. The segment with regional plants was under special care, and it was a separate part of the garden both in the architecture and in the catalogues. In the following years the collections were enriched with new species, discovered during exploring trips made by both naturalists who brought them to the garden. The plants were studied, their biology and varieties were analysed, and then described. The reports on discoveries were published in scientific periodicals.

The garden in Krzemieniec published catalogues, which enabled exchanges with other botanical centres. In the years 1810–1830 twelve catalogues were published⁵. There were also seed registers, published with the same aim. The garden exchanged new species, found during scientific trips, with other centres. New species were identified in the garden. The publi-

¹ J. Oleszakowa, *Ogród Botaniczny w Krzemieńcu i jego katalogi* in: *Studia i Materiały z Dziejów Nauki Polskiej*, 21, 1971, B series, pp. 59–81.

² The bibliography on the Botanical Garden in Krzemieniec is not rich. The most important title is still a work written on the basis of Besser's notes: R. Trautvetter, *Ueber den Krzemieniecer botanische Garten* in: *Bulletin de la Société Impériale des Naturalistes de Moscou* 2, 1844, p. 387; see also J. Oleszakowa, *Ogród Botaniczny w Krzemieńcu i jego katalogi*; W. Grębecka, *Wilno – Krzemieniec*, pp. 74–77; J. Mowszowicz, *Notatki o dawnym krzemienieckim ogrodzie botanicznym w 160-lecie założenia (1805–1832)* in: *Wiadomości Botaniczne* 2, 1965, p. 190.

³ E. Jankowski, *Dzieje ogrodnictwa w Polsce*, Warszawa 1923, p. 122.

⁴ E. Jankowski, *Dzieje ogrodnictwa w Polsce*, p. 123.

⁵ J. Oleszakowa, *Ogród Botaniczny w Krzemieńcu i jego katalogi*, p. 70; W. Grębecka, *Wilno – Krzemieniec*, pp. 75–77.

cations of the garden were prepared either in French or in Latin and sent to other botanical gardens. A good example of such collaboration was exchanging a beautiful bush of the species *Azalea pontica* (*Rhododendron flavum*). The plant was found growing wild in Volyn, to the west of the range of the colonies of the species, which was an important scientific discovery. (It had been believed that the plant is an endemic species of the Caucasus). In his *Introduction to the Catalogue* published in 1811 Besser explained the discovery. The plant was found by Mikler, while the botanical description and correct identification were made by Franciszek Scheidt. Scheidt also described the meaning of the new site (probably near the village of Siedliszcze on the Słucz river) for the biology of the species and the analysis of its range. From the very beginning the number of plants that could be exchanged was big. In the *Catalogue* published in 1810 Besser lists 696 species of regional plants, and in the *Seed register* [*Rejestr nasion*] printed in 1821, where 892 species were listed for exchange, a huge percentage was of the species characteristic for Volyn and Podolia. Discovering the species, describing them and introducing to the world science were a merit of the Botanical Garden in Krzemieniec.

The number of the plant species in the collection grew fast and was impressive. The data published in the catalogues reveal that in 1810 there were 2882 species in the garden, 6400 in 1815, 8350 in 1824, and about 12,000 in 1832 (before moving the garden to Kiev).

Antoni Andrzejowski contributed largely to the increase of the collection of the Botanical Garden in Krzemieniec. From his trips made in Volyn, Podolia, the southern part of Polesie and Poberezhje he brought many species that had not been known before. Even when he did not study and did not work in Krzemieniec he sent his collections to the garden. In 1811 he brought 29 new species, 19 in 1812, 7 in 1813, 95 in 1814, and 35 in 1815. The year 1814, in which he made his first trip, lasting many month, was the beginning of a period of important discoveries¹.

Thanks to its architecture, the sizes of particular collections and exemplary care and identification of the plants the garden in Krzemieniec had the rank of a university garden. Running the enterprise exceeded the school budget possibilities, therefore it faced numerous difficulties. The problems ranged from employing professional gardeners to constant exceeding the funds for exchanging letters, both domestic and foreign. Besser many times appealed to authorities, stressing the meaning of the garden for the reputation of the school and Polish science².

Krzemieniec exchanged plant specimens with 60 gardens in the East and West, including old and famous gardens in Paris, Montpellier, near London (Kew), Leyden, Polish university gardens in Vilnius, Warsaw and Cracow, as well as famous private gardens and newer, quickly developing gardens, like Gorenki (near Moscow), gardens in Wrocław, Prague and others. The large-scale scientific collaboration allowed the Krzemieniec botanists to work with

¹ J. Oleszakowa, *Ogród Botaniczny w Krzemieńcu i jego katalogi*, tables.

² W. Besser, *Prośba od nauczyciela*, sheet 113.

impressive results in a difficult period of transition in science, which required much botanical competence and possibilities of making comparative research work. The beautiful garden in Krzemieniec, of great scientific value, was a very valuable tool.

Krzemieniec was an important spot on the map of the European science, partly thanks to its location. It was an excellent base for the research trips made by Andrzejowski and the comparative work, in which Besser excelled. The garden was a pioneer centre in the difficult transition area. Due to exceptional and rich flora collection, beautiful plant album collections and a high level of the research work the garden was often visited by outstanding scientists who came to this spot of great importance for a botanist¹. The publications prepared by the naturalists from Krzemieniec were widely known and quoted. New plant species, discovered by the scientists, were mentioned in important synthetical publications, such as *Prodromus Systematis Naturalis Regni Vegetabilis. Pars prima* by August P. de Candolle (Paris, 1824). The Krzemieniec scientists published their reports themselves in renowned periodicals. All the scientist exploring later the areas studied by the botanists from Krzemieniec quoted their works. Although they were not lost for the science and still were used by botanists analysing the flora of the region, all the invaluable collections were taken by the Kiev University. The collections became a basis for establishing many scientific departments². About 1,000 plant sheets collected by Andrzejowski were moved to the Kiev collection. It was also there that zoological specimens and plants from the Botanical Garden were moved. The unprecedented move was a devastation of the beautiful centre of botanical research³. Now it is a duty of the historians of botany to restore this beautiful page of the Polish science.

translated by Jacek Lang

¹ W. Besser, *Prośba od nauczyciela*, sheet 113.

² W. S. Ikonnikov (ed.), *Istoriko–statisticheskija zapiski ob' uchenych i ucheno–wspomagatelnych uche-rezhdednijach imperatorskogo universitieta sw. Vladimira (1834–1884)*, Kiev 1884, pp. 141–157 – F. Szmalgauzen in section *Botanicheskij sad* mentions that the following specimens were brought to Krzemieniec in 1842: 1466 species of greenhouse plants, 585 trees and bushes, 521 species of decorative plants and 2452 perennials, in sum 5024 species and varieties, as well as seed collections of 3920 species and varieties.

³ M. Danilewiczowa, *Życie naukowe dawnego Liceum krzemienieckiego*, pp. 71–91.