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THE TYRANNY OF SCHOOLS: NATURE AND NATION IN THE SCHOOLS OF TRANSYLVANIA AND THE ROMANIAN KINGDOM, 1870-1914[*1]

Cosmin Koszor-Codrea

Abstract

This research investigates the development of the nature study movement in the secondary schools of Transylvania and the Romanian Kingdom between 1870 and 1914. Building on the scholarship dealing with the rise of the "biological perspective" in Germany, the paper deals with the roots of the Romanian nature preservation movement and its relationship with the political and economic projects of nation-building that developed in the dualist Austrian-Hungarian Empire. It analyses how methodological changes in the teaching of natural history and the introduction of teaching aids such as nature excursions, botanical school gardens, and celebrations of birds and trees, influenced the development of a nationalist, utilitarian, anthropocentric and racial approach toward the natural environment.

Keywords: History of science, environmental history, nationalism, botanical school gardens, bird and tree day, biological method

Introduction

Seven years after the controversial Hungarian school reform of Minister Albert Apponyi (1846-1933) implemented its forced Magyarization law in 1906, Victor Stanciu (1884-1964), a natural history teacher, gathered the Romanian secondary school children from Arad at the local Orthodox Church. It was Sunday morning in April during the blossoming spring of 1913. The young boys and girls, all dressed in festive costumes, already

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knew that a long and tiring day awaited them. After the religious service, they were taken to the local school in order to equip themselves with food supplies, paper lanterns, heavy shovels, and with their own seedling trees. They were taken on a short trip to the surrounding green meadows, where they had to recall the main ideas they had imbibed in school and church. Here the students of the fourth and second grades read poems about Romanian national history, and about birds, and other nature-related stories written by iconic authors such as Mihai Eminescu (1850-1899) and Ion Creangă (1837-1899). The peak of the event came when the children were required to make the so-called "solemn vow", namely to promise that they will spare the life of birds and trees. Next, each of them subscribed to a list of precepts according to which they were obliged not to chase or kill birds, nor to damage their nests, and committing them to stopping others from seeking to cause them harm. After planting their own mulberry trees, willows and lindens, they finally had a break and knew that the annual edition of the "Celebration of Birds and Trees" was almost over.[2]

Events such as the "Celebration of Birds and Trees" were an inclusive part of the development of the new attitudes towards the natural environment that were practised in the dual monarchy of Austria-Hungary as well as of the highly contested educational reform programmes enforced by the Hungarian administration in its multi-ethnic territories such as Transylvania. As numerous scholars of the history of secondary education have shown, throughout its several school laws, the Hungarian state shifted from a multi-ethnic autonomous education system (act 38/1868) to the introduction of mandatory lessons in the Hungarian language (act 18/1879). The educational reforms soon culminated in the full state control of secondary schools, instituted by the introduction of Apponyi's law (act 27/1907), which made all teachers into state servants as their salaries were provided by the government. Teachers working in confessional, popular and communal schools were guaranteed a minimum salary that was provided through the state aid system.[3] To receive this state aid, Romanian schools had to comply with the state politics of forced Magyarization and bring their own contribution to the Hungarian nation-building agenda. However, the Magyarization of the teaching programme also brought several uncontested benefits such as the modernization of school infrastructure and their premises, the increase of literacy, and the improvement of school hygienic conditions and teaching equipment.[4]

At the same time, turning to the teaching of natural history in the secondary schools of Transylvania, several pedagogues also introduced

the German reforms that were part of the so-called "Heimatkunde", which overlapped with what in the United States was called the nature study movement.[5] Environmental historian Lynn Nyhart showed that, during the 1890s, German natural history teachers following Friederich Junge's work (1832-1905) shifted from the old taxonomic classification of nature to the so-called "biological perspective", which focused on the "relationships among organisms, their physical environment, and their geographic and ecological place in the world."[6] Likewise, Nyhart explained that field trip excursions became part of the curriculum in order for pupils "to learn about nature in nature" while at the same time, other teaching aids such as terrariums and aquariums were introduced.[7] The "staging of nature" in secondary schools was soon doubled by various teaching aids such as herbariums, zoological models, and wallcharts that showed the range of biological habitats in the students' surrounding environment.[8]

If these factors have received a fair amount of attention, lesser known to the scholarship is how the nature study movement played out in multi-ethnic interimperial territories such as Transylvania, where Hungarian, Saxon, Romanian, Roma and Jewish coexisted and contested racial hierarchies of power.[9] Here the introduction of botanical school gardens, the celebration of birds and trees, nature excursions in the Carpathian Mountains, and school manuals of natural history discussing racial taxonomies were all part of the redefinition of national belonging put forward mostly by Hungarian, Saxon and Romanian elite cultural and scientific associations.[10] Adopting the school reforms enacted by the Hungarian Ministry of Religion and Public Education and coupled with the changes in the teachings of natural history, the Romanian teachers appropriated these, for their own benefits by building on their own national consciousness that facilitated the rediscovery of the natural environment in Romanian national terms. Comparatively speaking, similar developments are to be traced in the Romanian Kingdom, where natural history teachers tried to keep up with their Western peers, adopting to a certain extent similar teaching methods. Closely related to these changes, all these school reforms eventually paved the way to what it soon became after the First World War the Romanian nature preservation movement.

"Teaching methods not books"

The teaching of natural history in the Romanian schools in Transylvania dates back to the late eighteenth century. The Austrian Empress Maria

Theresa (1717-1780) through the act of *Ratio Educationis totius re literariae per regnum hungariae et privincias* from 1777, enacted that the study of nature in secondary schools was to be divided according to the three kingdoms of zoology, botany and mineralogy. Natural history was, at the time, mainly focused on the classification system shaped by the Swedish naturalist Carl Linnaeus (1707-1708). For instance, when it came to the teaching of zoology, for two hours per week, children were introduced to an anthropocentric view of nature and instructed in the classification of animals into classes, genera, species, and their usefulness and harmfulness to the economy. Obliged to memorize the species' Latin and popular names, the courses culminated with the hierarchical study of human racial classification, while relating all these to the wisdom and power of the Creator.[11]

However, in the 1830s a shift in teaching methods was made by the publication of August Lüben's (1804-1874) method, *Leitfaden für den Unterricht in der Naturgeschichte in Volksschulen* [*Guide for teaching natural history in primary schools*], which advocated for visual education of nature and for taking children outside the classroom in the natural environment. His method, alongside other emerging pedagogical aids such as aquariums, terrariums and school gardens, stressed on the observation first of the natural objects pertaining to the homeland of each school, with a focus on the most common species known by students (*e.g.*, the horse, common flowers, salt) and the relationship between the three natural kingdoms. It also insisted on the idea that lectures should start from simple facts and develop into complex descriptions. Although Lüben's inductive method brought several benefits such as outdoor natural explorations, children did not escape the subject of systematics and the hierarchical racial classifications of human diversity that placed the white European on top of the so-called chain of beings.[12]

Much discussed in Hungarian pedagogical periodicals up until the interwar period, Lüben's method was eventually adopted in the secondary schools of the Hungarian Kingdom. With few exceptions such as the Saxon Evangelic Gymnasium from Kronstadt (now Brașov), most of these secondary schools were dedicated for boys. Central to this debate was the famous Hungarian pedagogue and reformer of popular schools Pál Gönczy (1817-1892). A former teacher and member of the Hungarian Natural Science Society, in 1867 he was appointed as departmental advisor to the Ministry of Religion and Public Education by József Eötvös (1813-1871), then was promoted to ministerial adviser in 1874, and again

to state secretary in 1888. From these positions, Gönczy contributed to the modernization of the public-school system through the uniformization of the school buildings and their premises. In one of his works published in 1870, *Népiskolai épülettervek* [*Building plans for the public school*] he stipulated the hygienic requirements for classrooms such as lighting and furniture, ventilation and heating system, as well as the school building plot that consisted of a schoolyard for physical exercise, a teacher's farmyard, a garden, and a horticultural practice area.[13] In terms of natural history teaching aids, as early as 1852, he translated Lüben's guide for the teaching of botany. By the 1870s, however, he was the main advocate for visual education by promoting botanical natural excursions, the introduction of wallcharts for the study of mammals, relief maps of the Austrian-Hungarian Empire, atlases and convex globes.[14]

The "Lüben-Gönczy method", as it was later called by Hungarian teachers, was unevenly adopted throughout the Hungarian school system. For instance, until the end of the nineteenth century, Romanian Orthodox and Greek-Catholic confessional schools still enjoyed a certain autonomy to decide upon the teaching of natural history, while school reformers from Transylvania criticized their slow implementation of this method. Others such as Vasile Petri (1833-1905), a famous Romanian pedagogue and former teacher of the gymnasium from Naszód (now Năsăud), who had autonomy from ecclesiastical authorities, highlighted that "the study of botany without plants, of zoology without animals, […], is leaving the students indifferent and is even disgusting them."[15] Similarly, the botanist Artemiu Publiu Alexi (1847-1896), a natural history teacher at the same Romanian gymnasium, pointed out to the poor administration of natural history teaching in all Romanian, Hungarian and Saxon schools of Transylvania, due to the "pyramid structure of education". After describing the failure of both Greek-Catholic and Orthodox school programmes and pointing to the so-called "parrot method", under which students have to learn every subject by heart, he militated for the introduction of models replicating the human skeleton, wallcharts, nature expeditions, natural history collections, botanical school gardens, and meteorological stations.[16] Trained in natural science at the universities of Vienna and Graz, once appointed teacher at the Gymnasium at Naszód, he started reorganizing the study of natural history by providing the school with all the necessary equipment that Pál Gönczy advocated for. (see image 1)

The success of the "Lüben-Gönczy" method was by no means assured by its theoretical implications, which subserved the governance of

nature to the state economy and put it into the service of religious and nation-building agendas as school children had to learn practical gardening and trading skills. Iuliu Moisil (1859-147), one of Alexi's former students and a teacher of natural history in the cities of Slatina and Târgu Jiu, part of the Romanian Kingdom, began publishing pamphlets of practical guidance. He gave detailed instructions on the building of herbariums, terrariums, aquariums, insectariums, techniques for stuffing and mounting animals, and the conservation of museum collections, all of which were exposing the bodies of dead animals for the local boys' natural history courses. Following Lüben's method, Moisil published in 1897 *Sciințele naturale, mijloacele și metoda lor în scolele secundare* [*Natural science, their means, and methods in secondary schools*] in which he expressed the high relevance of schools in making "people truly useful to the state". By this, he meant that the practical and economically useful knowledge gained by students in class, once at home, would be passed over to their families. Likewise, besides the religious education gained in schools, "the teaching of natural science, conducted with tact and skill is a powerful means of injecting the love of the homeland, the love for the Romanian land."[17] Paradoxically, the same text that described the conservation of dead animals also advised teachers to showcase moral examples from the life of animals and their social habits. By doing so, it was believed that the young boys would become "more interested in animals and show their love and spare them from torture."[18] Moral lessons aside, storytelling books from nature-inspired locations encouraged the exploration of nature in any possible setting by undertaking hiking trips, visits to migrating zoological museums, botanical gardens, natural history museums, in addition to commercial locations such as vegetable markets, public markets selling fish, birds, flowers, poultry and game, and seaports.[19]

If the advocates of the "Lüben-Gönczy" reforms accused others of teaching schoolchildren "the parrot method", by the 1890s a new generation of natural history teachers turned against them for preaching empty words, for promoting dead animals in classrooms and teaching the boring science of systematics. The key figure in this new approach to understanding the natural environment was the Prussian pedagogue Friedrich Junge, the head of the girls' school in the Schleswig-Holstein's city of Kiel. His idea of *Lebensgemeinschaft* (*i.e.* biotic community) was put forward in his 1885 book *Die Naturgeschichte in der Volksschule: Der Dorfteich als Lebensgemeinschaft* [*Natural History in the Secondary School: The Village Pond as a Biotic Community*]. Historian Lynn Nyhart

has shown that Junge put much emphasis on the "ability of organisms to maintain themselves in relation to their surroundings." In doing so, "instead of organizing the teaching of natural history around taxonomic categories, Junge proposed organizing it around the *Lebensgemeinschaften*, or biological communities, groups of organisms that lived in a particular chemico-physical setting and were dependent on that and on one another for their survival."[20] As the title of his book shows, the "community of life" was to be found in the village pond, and in other places in the proximity of children's classrooms, where they could benefit from "hands-on" training and find examples of the interdependence between species and their environment. By distancing itself from systematics and anatomy, "the biological" method advocated for the study of life as a whole, while also subscribing to Humboldt's famous phrase that "the richness of science no longer lies in the abundance of facts but linkage."[21]

In Transylvania, one of the first Romanian school teachers to incorporate Junge's method in his courses was the botanist based at the Sibiu Orthodox Theological Institute, Daniile P. Barcianu (1847-1903). After studying natural history in Vienna, Bonn, and Leipzig, Bracianu became a teacher and archdiocese inspector of primary schools, while being also involved in the popularization of Darwinism from a religious standpoint.[22] As early as 1881, in his published school manual *Elemente de istorie naturală pentru școalele populare* [*Elements of Natural History for Popular Schools*], discussing the mole's underground environment, he addressed the peasant-assumed superstitions and called upon the villagers to have mercy toward the mole and to no longer kill them, by showing their usefulness to the field economy.[23] In 1891, he published another article, specifically updating the pedagogical literature with Junge's teaching plan and explaining, "life communities could also be found in the field, in the forest, in the floodplain, in the orchard, on the seashore, in the sea, in the city, in the park, in a flower shop, in an aquarium, into the whole earth."[24] In 1891 he printed a methodological handbook, *Istoria naturală în școlele poporale* [*Natural History in Popular Schools*], which gave recommendations on the division of teaching material by relating these to Junge's method.[25] Another example was based on the underground "life community" observed while working in the garden, namely the close linkages between the roots of plants, the insects, the larvae, the mole cricket, and the mole.[26]

The success of Junge's biological method pertains also to the fact that, according to his views, it could easily "justify materialistic, pantheistic, [or]

Darwinist [...] world views, but also a deistic one."[27] Henceforth, natural history teachers from all over the ideological and spiritual spectrum took their cue in adopting it, as was the case of the Romanian Kingdom. This was possible through the implementation of the programmes of school reform around the turn of the twentieth century, that aimed at the modernization of both rural and urban schools, as envisioned by the education minister Spiru Haret (1851-1912).[28]

One of the first to adopt Junge's method was the Moldavian parasitologist, freethinker and Darwinian popularizer Nicolae Leon (1862-1931). A former student of Ernst Haeckel (1834-1919), Leon published in 1891 the handbook *Călăuza Zoologului* [*The Zoologist's Guide*] that reached a second edition in 1905 and received an award from the Romanian Academy. The handbook's aim was to help amateur naturalists and high school students to observe the local flora and fauna in their natural surroundings. Following Junge's idea of the living community, Leon's guide also encouraged students to explore nature by undertaking excursions and observing the natural habitats provided by ponds, plains, forests, as well as the nocturnal animal life. Leon's shift to the biological method appears clearly in his emphasis: "to study animals from a biological point of view, that is, [to study] their relationship to each other and to their environment, their alimentation habits and the way that they reproduce."[29] In the 1905 edition, Leon illustrated his argument by adding pictures of dioramas and made it clear that "a lake is a microcosm, an association of plants and animals, which live together according to the law of conservation, constrained by physical and chemical influences, dependent on one another, on the soil they live on, and on the [biological] group as whole."[30]

After the public intervention of geological authorities and members of the Romanian Academy such as Ion Simionescu (1873-1944) in 1900, a new series of articles and school-guiding textbooks proposed that both the urban and rural population should be made accustomed to the biological method. This, Simionescu believed, would increase their interest and love for the natural environment and at the same time for their own nation by taking more trips in nature.[31] However, in his 1909 lecture delivered at the pedagogical training school in Iași, he rightly pointed out that these views were also improved by the work of the German pedagogue Otto Schmeil (1860-1943), who simplified everything by reducing Junge's law to simple biological phrases such as "all predatory animals have sharp teeth".[32] Nevertheless, for Simionescu natural history teachers were to be

made responsible for building up all teaching aids and school collections without state funds. Moreover, when it came to conducting natural excursions, places that "strengthen children's spirit of revolt against social injustices" should be avoided.[33]

A rural school reformer and teacher at the normal school in Galați, Culea Apostol (1882-1949), adopted a different line of thinking. In his textbook published in 1910, *Învățământul despre natură în școala primară* [*Education about Nature in Primary School*] he gave a full account of the methods that should be used for the introduction of Junge's biological perspective. One of his first concerns was the decentralization of the Romanian education system that had to provide separate teaching programmes specific to a school's geographical region and natural setting. He claimed that the descriptive and morphological method still filled the children's minds with dead images, while due to the scarce use of the experimental method, "the school gives so many parrots, automatic humans with a bag full of empty words and incapable of an initiative of their own."[34] Given the status of education, he recommended that urban schoolchildren should be taken from time to time to the rural environment where nature reveals itself:

> Nature speaks to [urban children] only through books and paper, through the skeletons of dead animals, or it is not discussed at all. […] Instead of [real] things, [only] faces; instead of realities, [only] formulas to listen to and to repeat the talks; and where he sees reality, he sees it through metal bars, the lion in the zoological garden, the meadow in the botanical garden, the flowers and fruit trees in gardens with barbed wire fences, everything enclosed with a metal grid, everything shouting: do not touch! Do not step your foot! On the contrary, for rural children, the whole [nature] is open and free.[35]

Culea Apostol further addressed the anthropocentric view of natural history teaching methods, the emerging nature conservation movement and the religious views in relation to nonhuman species. For instance, after discussing Darwin's research he gave such examples like "the bird is singing not for the pleasure of human beings, but for the pleasure of other birds of the opposite sex." In a similar vein, he stressed that "the biggest enemy of animals is the human. He is the one oppressing and killing them, either for food and other necessities, either to suppress his competitors or to satisfy his inherited instincts to see living beings killed

by his own hand."[36] Referring also to the Darwinian struggle for survival, he pointed that humans, who viewed themselves as the "kings of nature", "destroyed, developed, moved, and modified life according to their own needs. Numerous species of plants and animals have been cramped in a tiny corner, to make space for [humans], several have died or been extinguished by humans or by the species favored by him." He went on to explain that according to this "master of nature", "a great part of plant breeding, the protection of certain animals, were not made in relation to the physical necessities, but for the aesthetical pleasure of his soul."[37] When it came to the Romanian peasants, he made it clear that their superstitious views should be changed through the education of their own children, but first these religiously acquired superstitions should be clearly identified:

> The peasant has his own classification [system], made after the usefulness and harmfulness that [animals] bring, according to their beauty and ugliness, and according to how God has divided them into good and bad beings. On the one side, there are the good blessed animals, the animals of God, birds of the sky, the birds of heaven, and on the other side the cursed ones: beasts, savage animals, and filthy ones. For some [animals], he has complete love and recognition, […] some he respects with piety for the services they brought to God, Virgin Mary or other saints. The peasant thinks that good beings should be kept because that is the way of God, while the dammed ones should be destroyed.[38]

Culea Apostol's guidebook brought several recommendations for the implementation of the biological method of teaching natural history in the Romanian Kingdom; however, his work was in line with the growing literature on the utilitarian protection of nature for the use of state economy.

Exploring the nation in nature

As early as 1853, Simeon Ulpianu (?-1863), a young Romanian student from the Transylvanian Greek-Catholic theological gymnasium of Balázsfalva (now Blaj), participant in the 1848 Revolution and future teacher at the pedagogical school in Hátszeg (now Haţeg), published a poem after a summer hike among the rocky peaks of the Retezat Mountains. The poem was dedicated, in gendered biological terms, to the "Romanian brothers in blood", while both expressing a call for the "conservation of the nation"

around the Carpathians and the Danube, as well as redefining nature as a place of escapism and national contemplation.

Because of the beauty of nature/ I climb to the azure mountains/ Where the air is purer where the snow is on the ridge/ To the azure with rocky peaks / Delighted by those patriots /That have escaped from the ugly houses and bigoted people.[39]

This act of what Eric Kaufmann and Oliver Zimmer have called the "naturalization of the nation"[40] was by no means the first. On 27 July 1839, a French teacher working at Saint Sava College in Bucharest, Jean Alexandre Vaillant (1804-1886), while struggling through a harsh summer blizzard, had reached the Omu Peak in Bucegi Mountains. Together with a friend on horseback and two peasant mountain guides from Comarnic, their twofold aim was to explore the natural landscape of the Carpathians and to undertake a symbolic political act by planting a tricolor flag on the Caraiman Peak. However, their plan was ruined by the dark clouds that forced them to descend, one by one, holding tight to the flagstaff, when one of the peasants called Stoica Vodă, baldly asked himself "What could be the point of waving a flag on Caraiman?"[41]

If the above-mentioned cases were small in number, the second part of the nineteenth century witnessed a growing interest in the exploration of the natural environment, especially the high mountain areas. Famous among upper-class activities, it soon led to the appearance of the Saxon, Hungarian and Romanian alpine associations, which developed around the Transylvanian Carpathian Mountains and most of which used the Romanian peasants and shepherds as their guides.[42] However, in the secondary school setting, among the first attempts to undertake nature excursions date back to 1864. Various teachers from Transylvania gathered at a pedagogical conference held in Hermannstadt (now Sibiu), and they stressed the importance of hygienic and health issues for their students while recommending excursions in nature during their summer vacations, to collect flowers and plants that were related to the school botanical knowledge.[43]

In line with the Hungarian school reforms modelled after the Lüben-Gönczy method, teachers followed up by recommending scientific excursions in nature. A concrete plan was proposed by Ioan Popea (1839-1903), a teacher of Romanian language at the boys' gymnasium of Kronstadt (now Braşov) and editor of the magazine *School and Family*. In one of his lectures, delivered at the local school in 1877, he emphasized the importance of children's obedience to the school, to laws, to orders,

and to religion. In his view, the young boys had an important role as "the future of the nation; hence the youth should be prepared to be the strongest foundation on which the edifice of Romanian nationality will be built." To achieve this goal, he recommended that the study of scientific books should be reinforced by excursions across meadows, forests, valleys, and especially hikes in order to discover the romantic scenery of Piatra Craiului and Bucegi Mountains. He lamented that, although the Carpathian Mountains were equals in their beauty to the Alps of Switzerland, it was with "embarrassment" that he had to admit the Transylvanian Mountains were "mostly visited by foreigners (*i.e.* Saxons and Hungarians mountaineers), […], that it was only *they* who found pleasure to delight their sight with the images of these great peaks."[44] Popea insisted that schoolchildren must start to learn to admire and love the natural beauties of the mountain landscapes, and further to relate these to their homeland. By doing so, national identity was overlaid with a true sense of the surrounding natural environment and to work towards nourishing future generations of healthy and hardworking Romanians. In his own words:

> Far from the Romanian student should be this kind of indifference, this coldness towards nature. Far should be this stupid and unmoving spirit, this spineless soul. Dear young students, we should leave those sore losers alone, weak and crippled, leave those made tired and scabby by the passing of time, who spend their free time sitting and sleeping – we should leave these people to spend their time in the corrupt air of cities and to swallow the street dust. You sweet, studious youth, you must have a lively sense for nature and its beauties. For you there should be no higher pleasure than to spend your free time in the fresh air, perfumed by blossomed orchards. You should not be ashamed to sleep on a grass bed, under the stars, in a beautiful glade, at the murmur of crystalline mountain water, near superb rocky cliffs, that lose their peaks in the clouds, and where you will hear from time to time, a *doina* played from a *caval*, from a bagpipe, or a *bucium*, that heavenly pure Romanian song, in which the whole soul of a people is translated through the powerful [sound] and through the sweet and tender notes.[45]

If excursions in nature could provide children with national identity feelings, the "book of nature" also gave direct contact with teaching materials for the study of botany, zoology, and mineralogy, which teachers believed would lead students to a moral and religious life. Hence,

advocates of "intuitive studies" through schools in the open air, such as Andrei Bârseanu (1858-1922), a teacher at the Romanian commercial high school at Kronstadt and director of ASTRA (The Transylvanian Association for Romanian Literature and the Culture of the Romanian People), insisted in 1887 that schoolchildren should be liberated from "the choking air of the classroom". Once outside, amidst living nature, teachers should guide students towards direct observations of fauna and flora, and encourage them to ask questions such as "Do you know the name of that bird and how its eggs are? […] What is the name of that mountain, and in what part of our region is it located?" After several questions focusing on the homeland, the final question was related to the Creator of the biological material. In his elitist tone, Bârseanu further advocated for excursions in the open air that would involve both to the urban and rural children, because even the latter should "be accustomed from an early age not to see nature as a cow good for milking, but to see nature as our great teacher and adviser."[46]

Returning to the Greek-Catholic gymnasium at Balázsfalva, one of the best-organized Romanian secondary schools in Transylvania in terms of teaching facilities, here nature excursions were a common activity for students and a precious resource for equipping the oldest Romanian natural history museum in the Hungarian Kingdom. When the young botanist and future nature conservationist Alexandru Borza (1887-1971) took the position of natural history teacher in 1911, he started to organize scientific excursions in the surrounding urban and natural sites. He learned to do so from his former teacher, the botanist, archaeologist and animal protectionist Béla Cserni (1842-1916) from the Roman Catholic Gymnasium at Gyulafehérvár (now Alba Iulia).[47]

In the same year of 1911, after a short research trip to the botanical garden of Breslau (now Wrocław), Borza received the visit of the famous German botanist Ferdinand Pax (1858-1942), and guided him to the Retezat and Parâng Mountains and to Turda Gorge, as part of Pax's botanical research on the vegetation of the Carpathians.[48] During the summer vacation of 1912, Borza together with three other teachers and 37 students went on a six-day journey in the Banat region. Passing through several cities such as Deva, Arad and Temesvár, they finally reached Stájerlakanina (now Anina). After visits at the local metal and coal industry, they continued the trip on the Danube towards Ada-Kaleh Island, all the while observing the limestone of the Carpathians, the Roman relics and the Hungarian regulation of the Danube.[49] On their way back, they

stopped at the bath resort of Herkulesfürdő (now Băile Herculane), where they hiked on the Domogled Mountain up to the "White Cross", making observations on the rare flora and pine trees that grows on the cliffs, and enjoyed the scenic view over Cerna Valley.[50]

In the Romanian Kingdom, during the last decades of the nineteenth century, teachers also recommended that excursions in nature should be related to the natural history course. Likewise, in the summer vacation of 1906, Dumitru M. Cădere (1874-1941), a teacher at the "Vasile Lupu" school in Iași, organized a seven-day excursion with 26 students from the National College around Neamțului Mountains, reaching as far as the Ceahlău peak. The aim of the excursion was to bring students closer both to nature and their homeland through performative actions such as direct observations of Orthodox churches and historical monuments, the singing of national songs, each of them receiving roles, while also making anti-Semitic observations about the Jewish community they encountered. In terms of natural history material, they gathered no more than 52 plants, 10 minerals, took some geological sketches, and made 20 photographs.[51]

Another example of a secondary school scientific excursion was initiated in Bucharest by Ion P. Licherdopol (1842-1908), a Darwinian malacologist, bird protectionist, and natural history teacher at the Bucharest commercial school. According to Licherdopol, the school had a long tradition of scientific excursions during the summer vacation. During the summer of 1899, Licherdopol together with 38 schoolchildren, undertook a long international excursion from Bucharest to Budapest via Orșova and returned to Bucharest through Transylvania *via* Predeal. Along the way, they made observations related to the environment and the historic Roman sites surrounding the Danube, and visited the most important museums in Budapest.[52] All these scientific excursions contributed in many ways to discovering both the natural environment and the Romanian homeland, which was described in the literary and historic texts. Teachers such as C. Ionescu from "Vasile Lupu" College in Iași sent several coleopteran species to the University of Iași to be identified, and explained that on "scientific excursions […] besides their instructive [importance], the young have the opportunity to develop a national feeling by knowing the land we live on. The blood and the energy of our life are forces given by the plains of our country, the forests, and every other [natural] treasure."[53]

Botanical school gardens in the service of the state economy

The Hungarian school law 38/1868 enacted by the liberal minister József Eötvös, aiming at the modernization of the public-school system, adopted Pál Gönczy's method of visual training in natural history. According to article 55, the law also stipulated that natural history should be related to agriculture and industry, while article 83 mentioned that each school should have a garden of at least two acres, where the apprentices would receive practical instruction in the cultivation of the soil, fruits, and grapes.[54] This meant not only bringing new teaching techniques to natural history, such as school gardens, but also integrating children as a free labour force into the Hungarian economy. Teachers believed that the move would further influence the rural peasants' way of doing agriculture by taking example from their children.

The key figure of the school garden movement in the second half of the nineteenth century, who gave a new approach to its aims and organization, and made possible its global spread, was the Silesian pedagogue Erasmus Schwab (1813-1917). After finishing his law studies at the University of Olomouc and Vienna, Schwab soon became a school inspector, supervising the implementation of the Austrian 1869 school law and taking field research trips in Hungary. His main ideas were laid out in the pamphlet, *Der Volksschulgarten: ein Beitrag zur Lösung der Aufgabe unserer Volkserziehung* [*The Public School Garden: A Contribution to the Solution of the Task of our Popular Education*] published in 1870. His plan came together after inspecting a rural secondary school and was based on the recent urban park that the people of Olomouc built after the city's destruction by war. Its text reached a third edition, while changing its name from "Public School Garden" to simply "School Garden". The change he acknowledged was due to the idea that the "[garden] belongs not merely to every public school, but to every school — for the deafmutes, for the feeble-minded, for orphans; to every polytechnic school (*Realschule*), to every gymnasium and every normal school […] also to every kindergarten."[55]

Before being translated into English in 1879, his pamphlet received institutional support from the Hungarian Ministry of Instruction, who sent it to all school inspectors, while the Austrian Ministry of Agriculture delivered it to its agricultural societies and teaching institutes.[56] In his pamphlet, Schwab emphasized that the existing network of two thousand Swedish botanical school gardens had already been reorganized after his

plans. However, the most important gardens were those first built between 1874-1875 in Austria and Germany. At the impulse of the emerging nature study movement, school gardens spread in Switzerland, France, Belgium, Holland and Russia, reaching by the end of the nineteenth century as far as the United States.[57] Its success was assured by the answers it gave to the emerging nation building aim of dominating nature, while offering at the same time an economic, scientific, aesthetical, instructive, national, civic, and religious education to children.

During the 1870s, across the Hungarian Kingdom, pedagogues such as Kalmár Ferenc (1828-1888) and János Ebenspanger (1845-1903), while discussing Froebel and Gönczy's plan for the school garden, quickly recommended Schwab's work and related it to the local cotton industry.[58] Soon the Hungarian Agricultural Minister encouraged the flourishing of school gardens, offering financial support to every school that built one. In Transylvania, in August each year teachers attended an eight-day training course held at the Saxon Agricultural School established in Mediasch (now Mediaș) in 1871. Here the newly appointed teacher August Salfeld (1835-1904), who had recently moved from Göttingen, while referring to Schwab's work, explained that "a well-equipped school garden can and must be the place where children will feel happy; it will make our children friends of nature and better people." Salfeld's plan was further coupled with Dimitrei Comșa's (1846-1931) horticulture pamphlets on the use of rural school gardens in Transylvania. Both texts supported the cultivation of various plant species that were useful for the economy in order to demonstrate the general principles of land exploitation methods, to introduce the peasants to agricultural science, and to spread the use of better tools.[59]

The work in the school garden was divided along gender lines, the boys dealing with horticulture and the girls with flowers and vegetables for domestic industry, while Salfeld also advised teachers on how gardens would keep their students in check.[60] Also seen as a form of rural plant breeding laboratory, he insisted that through school gardens children would "become economists if from an early age they are introduced to cleanliness, order, and diligence, acquiring in the same time the spirit for speculation; thus we can awaken in children the wish for the practical uses of life […] in doing so the national economy will progress."[61]

The Romanian schools in Transylvania also kept pace with the new scientific trend, as Artemiu Publiu Alexi established in 1875 a botanical school garden at the gymnasium at Naszód. Starting with 35 plant species,

over the following years it benefitted from donations of mountain flora collected by the Romanian botanist Florian Porcius (1816-1906) and an extra 120 seeds received from the Hungarian August Kanitz (1843-1906), who was the director of the scientific botanical garden at Kolozsvár (now Cluj-Napoca). In 1883, Alexi attached to the high school premises a meteorological station where measurements of wind, climate and humidity were taken three times a day and sent to the Budapest central meteorological and geomagnetic observatory.[62]

Although Alexi's garden was a short-lived project, the natural history teacher from the Greek-Catholic seminar at Balázsfalva, Alexandru Uilăcan (1846-1927), transformed, in 1881, the monastery horticulture garden into a botanical school garden. Using a geometrical plan, the work started with gingko biloba, shrubs, ornamental flowers, a section dedicated to pomology, and a mulberry tree section for the feeding of silkworms used in the textile industry. Passing through several modifications, in 1899 a plant bed was arranged in an elliptical form, dedicated to the memory of Empress Elisabeth (1837-1898) who was assassinated by the Italian anarchist Luigi Lucheni (1873-1910). At one end of the elliptical bed a black mulberry was planted, and at the other was a weeping beech. On each side, there were six ash trees and six maple trees, which were soon protected by the law (No 21.527/1900), enacted by the Hungarian Ministry of Agriculture. Shrubs forming the number "1900" were planted and other groups of medicinal, technological, and venomous plants were established. Ambrosiu Cheţianu (1868-1934) the newly appointed natural history teacher also reduced the number of ornamental plants and increased the vegetation pertaining to the surrounding region. Colourful clapboards replaced the zinc labels, on which the scientific Latin and Romanian popular names of the plants were written, while on the etiquettes of venomous plants, the motif of a skull was drawn for better recognition.[63]

However, the most significant modifications to the botanical school garden at Balázsfalva were brought in from 1911 onwards, when Alexandru Borza took charge of it. After finishing his theological studies in 1908 in Budapest, he stayed in the city and enrolled in the natural science department at the Faculty of Philosophy and graduated in 1911. In parallel, he also subscribed to a five months internship to the Secondary School Teacher Training Institute where the initiator of free education Pályi Sándor (1859-1929) introduced him to the "biological method envisaged by [Otto] Schmeil, the author of the much acclaimed [school] textbooks." He not only developed this method as a teacher in Blaj,

but in his own words, he passed it over "to a [new] generation of future professors attending the summer courses […] as well as to a teacher at the pedagogical seminar in Cluj."[64]

Of crucial importance for the future development of Borza's career, this was a time when the Hungarian Minister of Agriculture, Ignácz Darányi (1849-1927), together with the forester engineer and nature preservationist Károly Kaán (1867-1940) worked on the "Hungarian census of natural monuments". The impetus was given in 1907 on the occasion of the eighth International Congress of Agriculture, held in Vienna, when Hugo Conwentz (1855-1922) laid out his working plan regarding the state intervention for the protection of natural monuments. At their initiative, the Ministry of Education and Religion distributed to all its subordinated educational institutions the first edition of Kaán's 1909 pamphlet *A természeti emlékek fentartása* [*The Preservation of Natural Monuments*], which dealt with the preservation of the natural environment in Hungarian national terms.[65]

In the meantime, Borza carried on with his doctoral research on the systematics of *Cerastium* plant species under the supervision of Szabó Zoltán (1882-1944) and Mágócsy-Dietz Sándor (1855-1945) and eventually defended his doctoral dissertation in 1913. Receiving a fellowship from Bucharest, he further specialized for a short period in the botanical gardens of Breslau and Berlin. Once returned to Balázsfalva he continued his work as a substitute teacher and started the reorganization of the systematic section of the botanical school garden. During the school year of 1912/1913, together with his students, he established in the garden a natural geographic and ecological plantation called "Our Forest", which was comprised of all wood and herbaceous species of the oak and hornbeam forests found in the Târnava Valley. He then cultivated medicinal plants for the making of tinctures and oils that were brought from the Kolozsvár medicinal station. (see image 2)

Moreover, the botanical school garden at Balázsfalva exchanged on a yearly basis seeds with scientific botanical gardens in Budapest, Breslau, and Berlin. Borza introduced his students not only to the scouting movement, but also by 1916 was working with schoolchildren to establish several biological-ecological groups, namely those studying the aquatic vegetation of the garden's lakes, over which the students of the fourth grade had built a bridge. By the side of the lake, two hills were raised. On one, the vegetation of the Transylvanian plains was reproduced (*Salvia Transilvanica*, *Centaurea Ruthenica*), while on its higher counterpart the

mountain and subalpine flora of the Apuseni Mountains (*Syringe Iosikaea, Telekia speciose, Allium Obliquum, Saponaria Bellidifolia*) were grown. Beside the geobotanical groups of Mediterranean plants (*Ficus Carica, Nerium Oleander, Agave Americana, Ruta Suaveolens*), a small terrarium was organized in which students took care of turtles. The botanical school garden in Blaj was truly unique in Transylvania, having from 1917 onward the benefit of an open-air amphitheater where botanical lectures were held during good weather (see images 3 and 4).[66] After the political upheaval of the First World War, Borza was appointed director of the former Hungarian Botanical garden in Cluj and made use of the knowledge he gained there in order to build the Romanian infrastructure for the preservation of natural monuments. What started as a Hungarian project of the Magyarization of both nature and ethnic minorities turned, by the interwar period, into the Romanian national attempt towards nature conservation.

Protecting the economy through the "Celebration of Birds and Trees"

Another practice brought by successive changes in the teaching methods of natural history in secondary schools, and by the growing national and economic interest in the preservation of nature in Hungary, was the introduction of the "Celebration of Birds and Trees" in 1906. As one of the most important Hungarian nature preservationists Károly Kaán realized, Hungary had a long legislative history for the preservation of trees and birds. Most of these measures were in line with what Raf de Bont has recently called the "utilitarian tradition of bird protection" that was specific to the emerging nation states of the Central European region.[67] For instance, article 2 of the Hungarian Forest Act XXXI/1879 stipulated the protection of those forests and mountain regions which, if destroyed, would endanger the fertility of the lowlands or the safety of roads through natural calamities. Although the Hunting Act XX/1883 completely banned the shooting of the chamois, capercaillie, and all singing birds, it did permit the hunting of a long list of migratory birds and so-called "predatory or destructive animals" on private property such as vineyards and orchards. The Act XII/1894, dealing with agriculture and field police, divided the fauna into "useful" and "harmful" categories. Soon after the International Convention for the Protection of Birds held in Paris in 1902, where the Hungarian ornithologist and politician Ottó Herman (1835-1914) was a

key organizer, Agriculture Minister Ignácz Darányi adopted Herman's economic centered view of bird protection through the Act I/1906.[68]

All these measures were brought to the public agnda by naturalists, foresters and hunters, members of Hungarian societies for the protection of animals. These societies included the Magyar Országos Állatvédő Egyesűlet [Hungarian National Association for the Protection of Animals], first established in 1883, and from 1893 the Magyar Ornithologiai Központ [Hungarian Ornithological Centre], which printed the journal *Aquila*. Among the abovementioned advocates was the ornithologist István Chernel (1862-1922), who published his enormous two-volume treatise *Magyarország madarai különös tekintettel gazdasági jelentő ségökre* [*Birds of Hungary with Special Reference to Their Economic Importance*] in 1899 and was the first to organize the "Celebration of Birds and Trees" in 1902. In the meantime, his close friend Ottó Herman published in 1901 the first edition of his popular book *A madarak hasznáról és káráról* [*On the Benefits and Harms of Birds*], which reached 20,000 copies and was illustrated by Titusz Csörgey (1875-1961). After the Celebration of Trees and Birds had been introduced to America in 1894,[69] the Minister of Religion and Public Education, Albert Apponyi, while enacting the infamous forced Magyarization law in 1906, also obliged each school to organize, during May or June, a day for the protection of birds and trees.[70] Soon after, responding to pressure from the *Országos Állatvédő Egyesület* [National Animal Protection Association], the most important Hungarian newspaper of the time announced the appearance of *Gyermek Naptár* [*Children's Calendar*], which contained stories and advice on the economic importance of birds and trees. At the same time, other newspapers showed that in 1912, 7,000 schools from all over the Hungarian Kingdom organized the required celebration. (see image 5)

In Transylvania, the Greek-Catholic pedagogical magazine *Foaia Scolastică* [*The Scholastic Paper*] called upon all the Romanian school senates to introduce the birds and trees celebration into their curriculum. The aim was to make schoolchildren aware of the "ethical and economic importance of birds and trees," while by doing so teachers "will cultivate both their moral and religious spirit." Moreover, each school was obliged to send a report to the National Animal Protection Association in Budapest describing the activities that were organized.[71] In line with the Hungarian school measures, the Romanian natural history teacher and future nature preservationist Victor Stanciu, published in 1913 his working programme titled *Serbarea arborilor și a păserilor* [*Birds and Trees Celebration*]. In his

view, the celebration was extremely important, as the aim was to "awaken in children the love for birds, trees and all the living beings in nature." Moreover, he was trying to counteract the existing Romanian literature, which portrayed children as aggressive towards non-human species,[72] and to implement the Hungarian anthropocentric and economic view of conservation:

> If we want our fellow people not to kill birds by destroying their nests, shooting them, killing their chicks, and breaking their eggs, we need to learn [to protect them] from an early stage of life. We should teach children to love birds and trees and to learn their usefulness for people. This is the meaning of the birds and trees celebration, and it is good that the institution for animal protection takes into consideration also the education of the general masses in schools.[73]

The rationale behind the celebration, Stanciu explained, was the simple fact of the forests' strong influence on the climate; they kept in check the winds, controlled the warmth of the earth, and regulated the summer rains. After pointing to the impact of deforestation on the climate and the general economy, he highlighted that "as insects are the biggest enemies of trees, so birds are the biggest enemies of insects; a single swallow feeds its young with 900 insects daily."[74] Finally, Stanciu provided a list of birds, which were seen as "unpaid workers" due to their efforts for picking insects that were inhabiting the forests and gave examples of the activities for the celebration of birds and trees that other schools might be interested to adopt. Similar to the activities held in the schools from Arad described at the beginning of this paper, the Romanian schoolchildren from the schools of Brașov were gathered on 18 May 1915 on the Petriș Plateau to observe the surrounding mountain landscapes. After the church deacon gave his well-known prayer to God, the school director followed with a speech on the economic importance of the celebration and their duty to defend the country during the war. The peak of the event was reached when all the gathered students gave their solemn oath, which bound them not to harm the avifauna, and to stop others from torturing birds and destroying their nests. Afterwards, students from different grades sang Romanian national poems related to fauna and flora, while ending the celebration late in the evening.[75] Together with the "Celebration of the Carpathians" which mobilised schoolchildren to help soldiers fighting during the First World War,[76] the "Celebration of Trees and Birds" not

only aimed to teach children how to love nature from a anthropocentric perspective, but it also brought them in line with the national, economic and religious views imposed by each nation building agenda.

Conclusions

To sum up, discussions pertaining to the methods used to teach natural history, especially the introduction of Junge's biological method, brought several changes to the ways in which Hungarian, Saxon, and Romanian schoolteachers related and responded to the natural environment. These changes, however, were adopted along Hungarian education legislation that aimed at the Magyarization of its multi-ethnic territories, and which were in line with the utilitarian and anthropocentric view of nature preservation for the sake of the national economy. In this context, schoolchildren from Transylvania were taught to appreciate and protect the local fauna and flora through natural excursions and botanical school gardens, and further to build their identity upon myths bound to the landscape of the Carpathians Mountains in Romanian national terms. Although most of the Hungarian nature preservationists were hunters themselves, part of the blame fell on children who were perceived to be disrupting the natural environment and the economy by destroying birds' nests. This led to the introduction of the celebration of birds and trees in schools, where children were coerced to promise that they would not harm the avifauna. Of crucial importance, the Hungarian debates focusing on the protection of the natural monuments, which failed to be put into practice before the ending of the First World War, ultimately shaped the Romanian nature preservation movement of the interwar period.

ANNEXES

Image 1. Part of the natural science teaching collections from the Romanian Naszód/Năsăud Gymnasium comprising of animal wallcharts on the left wall, taxidermy collections, globes, insectariums, minerals and different species conserved in hermetic jars. Source: Virgil Șotropa and Nicolae Drăganu, *Istoria școalelor năsăudene* (Năsăud-Naszód: Tipografia G. Matheiu, 1913)

Image 2. Schoolchildren working in the botanical school garden of Balázsfalva/Blaj. Source: Ioan Popu-Câmpeanu and Alexandru Borza, *Grădina școlară a Liceului român unit de Băieți „Sf. Vasile cel Mare" din Blaj* (Blaj: Tipografia Seminarului, 1940)

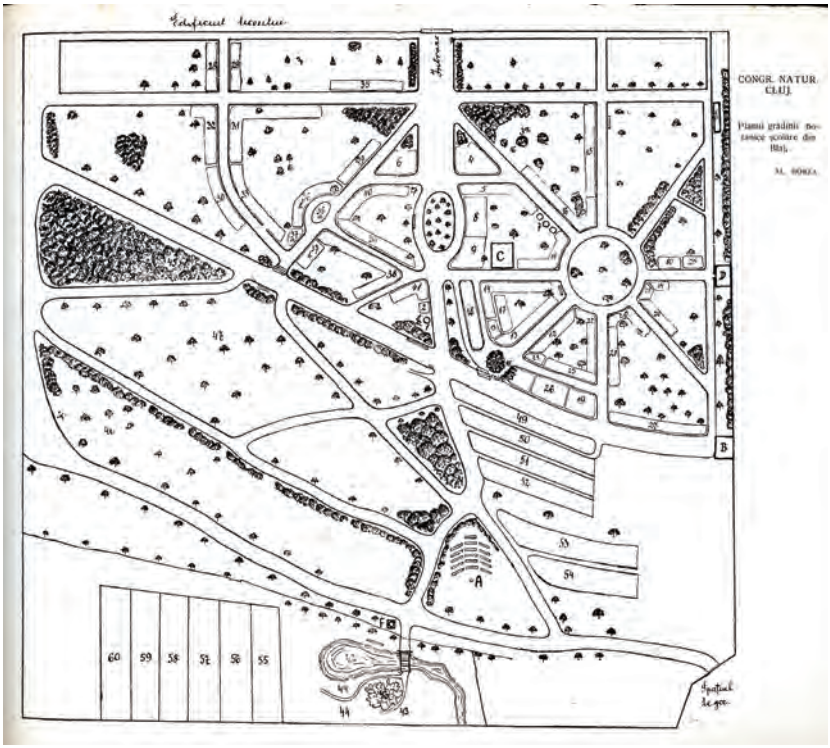

Image 3. The plan of the botanical school garden from Balázsfalva/Blaj arranged by Alexandru Borza with several biological sections such as 42. The lake, 43. The cliffs of Apuseni Mountains, 45. "Our Forest" and A. The Open Air Amphitheatre. Source: Alexandru Borza and Emil Pop (eds.), *Întâiul Congres Național al Naturaliștilor din România* (Cluj: Editura Societatea de Științe, 1930)

Image 4. A botanical lecture held in open air at the botanical school garden from Balázsfalva/Blaj. Source: Alexandru Borza and Emil Pop (eds.), *Întâiul Congres Național al Naturaliștilor din România* (Cluj: Editura Societatea de Științe, 1930)

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ban madáreleséget helyeztek el és az elültetendő palántákat. Homhányi László igazgató megemlékezett a nap jelentőségéről, a gyermekek tavaszi dalt énekeltek, azután két kis fiu előhozta az elültetendő fát, mely nemzeti szinü szalaggal volt diszitve. Lázár Kálmánné tanitónő ünnepi beszédet mondott, Molnár János tanitó alkalmi magyarázatot tartott, egy kis leány eleséget szórt a madaraknak. Ezután elültették a fát, a gyermekek egy-egy marék földet hordtak rá.

Madarak és fák napja

A Simor-utcai községi elemi iskola udvarán a tavaszi hóvihar kidöntött egy szép lombos fát. Az iskola vezetősége uj fát ültetett helyébe és ebbe az alkalomba kapcsolta be a szokásos madarak és fák ünnepét, melyet poétikus szertartással rendeztek. Gyászfátyollal takarták be a kidöntött fát, apró zászlókkal állták körül a gyermekek, egy asztalon pedig egy kis kosár-

Image 5. Birds and trees day celebrated by the municipal elementary school from Budapest in 1913. The article mentions that after a spring snowstorm blew a deciduous tree, a mourning veil was dropped over the tree, while small flags were placed around it, and a small basket with birdseed and seedlings to be planted was placed on a table. Children finally sang a spring song, and then two little boys brought a tree to be planted, which was decorated with the Hungarian national-coloured ribbon. Source: https://adt.arcanum.com

NOTES

1 I would like to thank the librarians of "Lucian Blaga" Central University Library from Cluj-Napoca for their help with several sources and access to the archives. Also I am extremely grateful to Simon Wilson for carefully proofreading this text and for all the precious comments that made me rethink the future of this research given by Răzvan Pârăianu, Diana Georgescu, George Andrei, Maria Bucur and Aliaksandra Valodzina.

2 The story is based on Victor Stanciu's recommendation on how to organize the bird and tree day in Arad. See Victor Stanciu, *Serbarea arborilor și a păserilor* (Arad: Tiparul tipografiei ort. Române, 1913) 21-22.

3 For more details on the educational school reforms in the Hungarian Kingdom see Joachim von Puttkamer, *Schulalltag und nationale integration in Ungarn Slowaken, Rumänen und Siebenbürger Sachsen in der Auseinandersetzung mit der Ungarischen Staatsidee 1867–1914* (München Oldenbourg, 2003); Paul Brusanowski, Învățământul confesional ortodox român din Transilvania între anii 1848-1918: între exigențele statului centralist și principiile autonomiei bisericești (Cluj-Napoca: Presa Universitarră Clujeană, 2010); Ágoston Berecz, *The Politics of Early Language Teaching: Hungarian in the Primary Scools of the Late Dual Monarchy* (Budapest: Central European University Press, 2013).

4 Mirela Popa-Andrei, "Legea școlară 38/1868 și efectele sale asupra evoluției învățământului confesional năsăudean" in *140 de ani de legislație minoritară în Europa Centrală și de Est,* Gidó Attila, Horváth István and Pál Judit (eds.) (Cluj-Napoca: Editura Institutului pentru Studierea Problemelor Minorităților Naționale: Kriterion, 2010) 138; For more details on the Romanian benefits of the Hungarian school legislations see also Ágoston Berecz, Ibid., 142-148.

5 Kevin C. Armitage, *The Nature Study Movement: The Forgotten Popularizer of America's Conservation Ethic* (Lawrence: University Press of Kansas, 2009).

6 Lynn K. Nyhart, *Modern Nature: The Rise of Biological Perspective in Germany* (Chicago: The University of Chicago, 2009) 22-23.

7 *Ibid.*, 175.

8 W. Degler, A. Juen, K. Klinger and M. Markert, "Staging nature in twentieth-century teacher education and classrooms", *Paedagogica Historica* (2019): DOI:10.1080/00309230.2019.1675731

9 After the Austro-Hungarian Compromise of 1867, Transylvania was incorporated into the Kingdom of Hungary as part of the Austro-Hungarian Empire. For more research on the interimperiality Transylvania see Anca Pârvulescu and Manuela Boatcă, *Creolizing the Modern: Transylvania across Empires* (Ithaca, NY: Cornell University Press, 2022).

10 For a comparative perspective of the contribution of the Saxon, Hungarian and Romanian scientific and cultural associations to regional studies

(*Landeskunde/Honismeret*) and the building of national hierarchies see Borbála Zsuzsanna Török, *Exploring Transylvania: Geographies of Knowledge and Entangled Histories in a Multiethnic Province, 1790-1918* (Leiden: Brill Academic Publishers, 2015).

11 Ambrosiu Chețianu, *Istoria naturală și museul de la școlele din Blaș* (Blaș: Tipografia Seminariului Achidecesan, 1902) VIII.

12 "Un nou metod de a preda istoria naturală în scolele elementare," Școla Română: Revistă pedagogică pentru interesele institutelor de învățământ la Români și pentru organele lor, Anul V, Nr. 1 (1891): 3-4.

13 Zoltán Megyeri-Pálffi, "Az 1868. évi népiskolai törvény végrehajtása: a népiskolai épületek és a hajdúszoboszlói polgári fiúiskola," *Régiókutatás Szemle* Vol. 1 (2019): 47-59.

14 Ferenc Vincze, *Gönczy Pál polgári népoktatást megalapozó életművének a Hajdú-Bihar Megyei Értéktárba történő felvételéhez* (Hajdúszoboszló, 2015) 1-18.

15 V.P., "Studiul sciințelor naturale în România," Școla română: foia pedagogică și didactică pentru interesele instituteloru de cultură și ale organeloru acestora Fasc. VIII, May (1879): 353-359.

16 A.P. Alessi, "Unele idei despre necesitatea de reforme privitoare la instructiunea sciinteloru naturale din institutele nostre de invetiementu," Școla Română: Foia pedagogică și didactică, Anul II, (1877): 379-394, 401-403, 409-414.

17 Iuliu Moisil, *Sciințele Naturale, mijloacele și metoda lor în scolele secundare* (Târgu Jiu: Tipo-Litografia Națională Nicu D. Milosescu, 1897) 25-26.

18 *Ibid.*, 25-26.

19 Iuliu Moisil, *Ibid.*, 53.

20 Lynn K. Nyhart, "Teaching Community via Biology in Late-Nineteenth-Century Germany," *Osiris*, 2002, Vol. 17 (2002): 149-150.

21 Lynn K. Nyhart, *Ibid.*, 150-151.

22 Cosmin Koszor-Codrea, *The Word of Science: Popularising Darwinism in Romania, 1859-1918* (PhD. diss. Oxford Brookes University, 2021) 268-269.

23 Daniil P. Barcianu, *Elemente de istoria naturală pentru scoalele poporale* (Sibiiu: Tipariul tipografiei archidiecesenane, 1881) 11-13.

24 "Un nou metod de a preda istoria naturală în scolele elementare," *Scola Română: Revista pedagogică pentru interesele instutelor de învetământ la Români și pentru organele lor*, Anul. V., Nr. 2 (1891): 10-11.

25 Daniil P. Barcianu, Istoria naturală în scolele poporale (Sibiu: Tiparul Tipografiei Archidiecesane, 1891) 4-6

26 *Ibid.*, 12-18.

27 Lynn K. Nyhart, *Ibid.*, 171.

28 Schifirneț Constantin, "Spiru Haret, Education and School Legislation Reform," *Revista Română de Sociologie*, Anul XXV, Nr. 3-4 (2014): 311-326.

29 Nicolae Leon, *Călăuza zoologului* (Iași: Editura I.S. Cuperman, 1891) 35.

30 Nicolae Leon, *Excursiuni zoologice* (București: „Minerva" Institut de arte grafice și editură, 1905) 19.

31 Ion Simionescu, "Cum stăm cu studiul științelor naturale în România," *Noua Revistă Română* Vol. 1, No. 10 (1900): 451-455; Ion Simionescu, "Cum se predau Științele Naturale în scoalele secundare," *Noua Revistă Română* Vol. 2 Nr. 23 (1900): 415-418.

32 Ioan Simionescu, Didactica științelor naturale (Iași: Tipografia „Progresul", 1909) 38-39.

33 Ioan Simionescu, Ibid., 26.

34 Apostol D. Culea, Învățământul despre natură în școala primară (Vălenii de Munte: Tipografia „Neamului Românesc", 1910) 267.

35 *Ibid.*, 203.

36 *Ibid.*, 23, 28-29.

37 *Ibid.*, 75-76.

38 *Ibid.*, 82-83.

39 Simeone Ulpianu, "Retezatulu peste vară," *Foaia pentru minte, anima și literatură* Vol. 13 (1853): 92.

40 Eric Kaufmann and Oliver Zimmer, "In search of the authentic nation: Landscape and national identity in Canada and Switzerland," *Nations and Nationalism* Vol. 4, Issue 4 (1998): 483-510.

41 Nestor Urechia, "Cel dintâi bucegist român," *Printre Hotare* Anul I, No. 5-6 (1908): 65-66; Mihai I. G. Haret, *O excursie în Bucegi în 1839 și alte descrieri de excursiuni* (București: Tipografia Profesională Dim. C. Ionescu, 1916) 39-57.

42 Some examples include, the Saxon Siebenbürgischen Alpeinverein (1873) which morphed in the Siebenbürgischen Karpaten Verein (1880), the Hungarian, Magyarországi Kárpát Egyesűlet (1873) formed in the high Tátras and followed by its Transylvanian counterpart, Erdély Kárpát Egyesűlet (1891) and the first Romanian, Cercul Excursioniștilor (1891).

43 Paul Brusanowski, *Ibid.*, 148.

44 Ioan Popea, "Idealele studentului Român," *Foișoara Telegrafului Român* Anul II. Nr. 2 (1877): 12-14.

45 Ioan Popea, *Ibid.*, 13-14.

46 Andrei Bârseanu, "În aer liber," Școla și familia: Foia pentru părinți și învețători Anul II, Nr. 3 (1887): 49-53.

47 Tudor Borza, "Alexandru Borza-copilăria și anii de studii" in *Alexandru Borza*, Vasile Cristea, Alexandra Șuteu and Mihai Pușcaș (eds.) (Cluj-Napoca: Presa Universitară Clujeană, 2021) 20-27; Alexandru Borza, "Excursia cercetașilor noștri," *Unirea* Anul XXVI, Nr. 8 (1916): 2-3; Alexandru Borza, *Amintiri despre arheologul A. Cserni și săpăturile dela Apulum* (Cluj: Tipografia Națională S.A. Cluj, 1936); See also, Csaba Szabó, *Belá Cserni*

and the Beginnings of Urban Archaeology in Alba Iulia (Cluj-Napoca: Editura Mega, 1916) 19-20, 34-43.

48 Alexandru Borza, "Ferdinand Pax: Schiță biografică," *Buletinul Gradinii Botanice și al Museului Botanic de la Universitatea din Cluj* Vol. XXV, No. 3-4 (1945): 36-37

49 For more details on the regulation of the Danube see Ștefan Dorondel and Șerban Stelu, "State, Experts, and Politics along the Lower Danube, 1900-1940," in Ștefan Dorondel and Șerban Stelu (eds.) *A New Ecological Order: Development and the Transformation of Nature in Eastern Europe* (Pittsburgh: University of Pittsburgh Press, 2022) 109-129.

50 Alexandru Borza, "Excursiuni," *Anuarul Institutelor Gr.-Cat. De Învățământ din Balazsfalva (Blaj)* (1912): 58-63;

51 D. M. Cădere, *O excursie școlară* (București: Minerva, 1906).

52 Ioan P. Licherdopol, *Excursiunea din maiu 1899* (București: Tipografia Dreptatea, 1899)

53 C. Ionescu, "Rolul educativ al științelor naturale," *Arhiva Societății Științifice și Lietrare* Vol. XVI, No. 4 (1905): 174; See also Alexandru Borza, "Excursiunile școlare," *Cultura Poporului* Anul IV, N-rul 53-54 (1924): 3

54 All Hungarian laws quoted in the text are accessible online in the Hungarian original at http://www.1000ev.hu/; Accessed on 20 November 2022.

55 Erasmus Schwab, *The School Garden: Being a Practical Contribution to the Subject of Education* (New York: M.L. Holbrook & CO, 1879) 14.

56 *Ibid.*, 10-11.

57 Maurice A. Bigelow, "Gardens, School; Gardens for Children" in A Cyclopedia of Education, vol. 3, ed. Paul Monroe (New York: Macmillan, 1914) 10-13; Sally Gregory Kohlstedt, "''A Better Crop of Boys and Girls'': The School Gardening Movement, 1890–1920," *History of Education Quarterly* Vol. 48, No. 1 (2008): 58-93.

58 Kalmár Ferenc, "Alakítsuk át az iskolaudvarát kertté" *Néptanítók Lapja* Évfolzam VII, 6 szám (1874): 90-91; János Ebenspanger, "A kozoktatas fokozatos fejlődese" in *Iskolai értesítők* (Felsőlövő: Evangélikus Gimnázium, 1879) 4.

59 August Salfeld, "Grădina scoalei populare" *Foișoara Telegrafului Român* Anul I, Nr. 3 (1876): 17-18; see also Dimitrie Comșa, "Pomăritul: întocmit cu deosebită privire la Grădina scolară," in *Cărțile Săteanului Românu: Scrieere lunară pentru trebuințele poporului românu*, Cursul II (1877): 108-115.

60 August Salfeld, "Grădina scoalei populare" *Foișoara Telegrafului Român* Anul I, Nr. 5 (1876): 36-37.

61 August Salfeld, "Grădina scoalei populare" *Foișoara Telegrafului Român* Anul I, Nr. 6 (1876): 43-45.

62 Virgil Șotropa and Nicolae Drăganu, *Istoria școalelor năsăudene* (Năsăud-Naszód: Tipografia G. Matheiu, 1913) 296-298; Iuliu Moisil, *Figuri Grănițerești Năsăudene* (Năsăud: Editura Regna, 1937) 241-242; See also

A.P. Alexi, *Compendiu de meteorologiă* (Brașov: Tipografia Alexi, 1889); For the history of meterology in the Austrian-Hungarian Monarchy see also Deborah R. Coen, *Climate in Motion: Science, Empire, and the Problem of Scale* (Chicago: University of Chicago Press, 2018).

63 Ioan Popu-Câmpeanu and Alexandru Borza, *Grădina școlară a Liceului român unit de Băieți „Sf. Vasile cel Mare" din Blaj* (Blaj: Tipografia Seminarului, 1940) 7-8.

64 Quoted in Tudor Borza, *Ibid.*, 39.

65 The pamphlet reached three editions by the interwar, Kaán Károly, *A természeti emlékek fentartása - A m. kir. földmivelésügyi minister kiadványa* (Budapest: Pallas Részvénytársaság Nyomdája, 1909); For more details on the distribution of his text see Károly Kaán, *A természeti emlékek fentartásának kérdéséhez* (Budapest: Pallas Részvénytársaság Nyomdája, 1914) 12-13.

66 Alexandru Borza, "Musele Gimnasiali," in *Anuarul Institutelor Gr.-Cat. De Învățământ din Balazsfalva* (Blaj) (1914): 56; Alexandru Borza, "Grădina botanică școlară" in Alexandru Borza and Emil Pop (eds.), *Întâiul Congres Național al Naturaliștilor din România* (Cluj: Editura Societatea de Științe, 1930), 421-437; Ioan Popu-Câmpeanu and Alexandru Borza, *Ibid.*, 9-11.

67 Raf de Bont, *Nature's Diplomats: Science, Internationalism and Preservation, 1920-1960* (Pittsburgh: University of Pittsburgh Press 2021) 87-89.

68 See note 53. For the Hungarian bird's protection law from 1906 see https://net.jogtar.hu/getpdf?docid=90600001.TV&targetdate=&printTitle=1906.+%C3%A9vi+I.+t%C3%B6rv%C3%A9nycikk&referer=1000ev accessed on 10 December 2022. For more details of the Paris international conference see Juan José Ferrero-García, "*The International Convention for the Protection of Birds (1902): A Missed Opportunity for Wildlife Conservation?,*" *Ardeola*, Vol. 60, No. 2 (2013): *385–396.*

69 Kevin C. Armitage, "Birds day for kids: Progressive conservation in theory and practice," *Environmental History* Vol. 12 (2007): 528-551.

70 Kaán Károly, *Természetvédelem és a természeti emlékek* (Budapest: Révai Testvérek Irodalmi Intézet Részénztársaság, 1931) 31-34.

71 "Reuniunea regnicolară pentru apărarea animalelor" *Foaia scolastică* Anul XIV (Blaj: Tipografia Seminarului teologic gr-cat., 1912) 377-378, 346-347.

72 Valeska Bopp-Filimonov, "Saddening Encounters: Children and Animals in Romanian Fiction and Beyond," *STUDIA UBB PHILOLOGIA*, Vol. LXVII, 2 (2022): 13 – 34.

73 Victor Stanciu, *Ibid.*, 16.

74 *Ibid.*, 13.

75 "O serbare școlară" *Gazeta Transilvaniei* Anul 78, Nr. 96 (1915): 2.

76 Ioan Păcurariu, "Pământul și omul, Carpații și istoria patriei noastre" in *Raportul al LIII-lea despre gimnaziul superior fundaț. din Naszód-Năsăud pentru anul școlar 1915-16* (Bistrița: Tipografia G. Matheiu, 1915).

Bibliography

***, http://www.1000ev.hu/

***, "Un nou metod de a preda istoria naturală în scolele elementare," *Școla Română: Revistă pedagogică pentru interesele institutelor de învățământ la Români și pentru organele lor*, Anul V, Nr. 1-2, 1891, pp. 3-4, 10-11.

***, "Reuniunea regnicolară pentru apărarea animalelor", *Foaia scolastică*, Anul XIV, Blaj, Tipografia Seminarului teologic gr-cat., 1912, pp. 377-378, 346-347.

***, "O serbare școlară" *Gazeta Transilvaniei*, Anul 78, Nr. 96, 1915, p. 2.

Alessi, A.P., "Unele idei despre necesitatea de reforme privitoare la instructiunea sciinteloru naturale din institutele nostre de invetiementu," *Școla Română: Foia pedagogică și didactică*, Anul II, 1877, pp. 379-414.

Armitage, C., K., *The Nature Study Movement: The Forgotten Popularizer of America's Conservation Ethic*, Lawrence, University Press of Kansas, 2009.

—, "Birds day for kids: Progressive conservation in theory and practice," *Environmental History*, Vol. 12, 2007, pp. 528-551.

Barcianu, D.P., *Elemente de istoria naturală pentru scoalele poporale*, Sibiiu, Tipariul tipografiei archidiecesenane, 1881.

—, Istoria naturală în scolele poporale, Sibiu, Tiparul Tipografiei Archidiecesane, 1891.

Bârseanu, A. "În aer liber," *Școla și familia: Foia pentru părinți și învețători*, Anul II, Nr. 3, 1887, pp. 49-53.

Berecz, Á., *The Politics of Early Language Teaching: Hungarian in the Primary Scools of the Late Dual* Monarchy, Budapest, Central European University Press, 2013.

Bigelow, M.A., "Gardens, School; Gardens for Children" in *A Cyclopedia of Education*, vol. 3, ed. Paul Monroe, New York, Macmillan, 1914, 10-13.

Brusanowski, P., *Învățământul confesional ortodox român din Transilvania între anii 1848-1918: între exigențele statului centralist și principiile autonomiei bisericești*, Cluj-Napoca, Presa Universitarră Clujeană, 2010.

Bopp-Filimonov, V., "Saddening Encounters: Children and Animals in Romanian Fiction and Beyond," *STUDIA UBB PHILOLOGIA*, Vol. LXVII, 2, 2022, pp. 13 – 34.

Borza, A., "Excursia cercetașilor noștri," *Unirea*, Anul XXVI, Nr. 8, 1916, pp. 2-3.

—, *Amintiri despre arheologul A. Cserni și săpăturile dela* Apulum, Cluj, Tipografia Națională S.A. Cluj, 1936.

—, "Ferdinand Pax: Schiță biografică," *Buletinul Gradinii Botanice și al Museului Botanic de la Universitatea din Cluj*, Vol. XXV, No. 3-4, 1945, pp. 36-37.

—, "Excursiuni," *Anuarul Institutelor Gr.-Cat. De Învățământ din Balazsfalva (Blaj)*, 1912, pp. 58-63.

—, "Excursiunile școlare," *Cultura Poporului*, Anul IV, N-rul 53-54, 1924, p. 3.

—, "Musele Gimnasiali," in *Anuarul Institutelor Gr.-Cat. De* Învățământ *din Balazsfalva* (Blaj) (1914): 56;

—, "Grădina botanică școlară" In Borza, A., and Pop, E., (eds.), *Întâiul Congres Național al Naturaliștilor din România,* Cluj, Editura Societatea de Științe, 1930, pp. 421-437.

Borza, T., "Alexandru Borza-copilăria și anii de studii" In Cristea V., Șuteu A., and Pușcaș, M., (eds.) *Alexandru Borza*, Cluj-Napoca, Presa Universitară Clujeană, 2021, pp. 20-27.

Cădere, D.M., *O excursie școlară*, București, Minerva, 1906.

Chețianu, A., *Istoria naturală și museul de la școlele din Blaș*, Blaș, Tipografia Seminariului Arhidiecesan, 1902.

Coen, D., D., *Climate in Motion: Science, Empire, and the Problem of Scale*, Chicago, University of Chicago Press, 2018.

Comșa, D., "Pomăritul: întocmit cu deosebită privire la Grădina scolară," in *Cărțile Săteanului Românu: Scrieere lunară pentru trebuințele poporului românu*, Cursul II, 1877, 108-115.

Csaba, S., *Belá Cserni and the Beginnings of Urban Archaeology in Alba Iulia*, Cluj-Napoca, Editura Mega, 1916.

Culea, D. A., *Învățământul despre natură în școala primară*, Vălenii de Munte, Tipografia „Neamului Românesc", 1910.

De Bont, R., *Nature's Diplomats: Science, Internationalism and Preservation, 1920-1960*, Pittsburgh, University of Pittsburgh Press, 2021.

Degler, W., et.al., "Staging nature in twentieth-century teacher education and classrooms", *Paedagogica Historica* (2019): DOI:10.1080/00309230.2019.1675731

Dorondel, Ș., and Stelu, Ș., "State, Experts, and Politics along the Lower Danube, 1900-1940," in Dorondel Ș., and Stelu, Ș., (eds.) *A New Ecological Order: Development and the Transformation of Nature in Eastern Europe*, Pittsburgh, University of Pittsburgh Press, 2022.

Ebenspanger, J., "A kozoktatas fokozatos fejlődese" in *Iskolai értesítők*, Felsőlövő: Evangélikus Gimnázium, 1879.

Ferrero-García, J. J., "*The International Convention for the Protection of Birds (1902): A Missed Opportunity for Wildlife Conservation?*", *Ardeola*, Vol. 60, No. 2, 2013, pp. 385–396.

Haret, M., *O excursie în Bucegi în 1839 și alte descrieri de excursiuni*, București, Tipografia Profesională Dim. C. Ionescu, 1916.

Ionescu, C. "Rolul educativ al științelor naturale," *Arhiva Societății Științifice și Literare*, Vol. XVI, No. 4, 1905, p. 174.

Kalmár, F., "Alakítsuk át az iskolaudvarát kertté" *Néptanítók Lapja* Évfolzam VII, 6 szám (1874): 90-91.

Kaufmann, E., and Zimmer, O., "In search of the authentic nation: Landscape and national identity in Canada and Switzerland," *Nations and Nationalism*, Vol. 4, Issue 4, 1998, pp. 483-510.

Károly, K., *A természeti emlékek fentartása - A m. kir. földmivelésügyi minister kiadványa*, Budapest, Pallas Részvénytársaság Nyomdája, 1909.

—, *Természetvédelem és a természeti emlékek*, Budapest, Révai Testvérek Irodalmi Intézet Részénztársaság, 1931.

Kohlstedt, S.G., "'A Better Crop of Boys and Girls'': The School Gardening Movement, 1890–1920," *History of Education Quarterly*, Vol. 48, No. 1, 2008, pp. 58-93.

Koszor-Codrea, C., *The Word of Science: Popularising Darwinism in Romania, 1859-1918*, PhD. diss., Oxford, Oxford Brookes University, 2021.

Licherdopol, I.P., *Excursiunea din maiu 1899*, București, Tipografia Dreptatea, 1899.

Leon, N., *Călăuza zoologului*, Iași, Editura I.S. Cuperman, 1891.

—, *Excursiuni zoologice*, București, „Minerva" Institut de arte grafice și editură, 1905.

Megyeri-Pálffi, Z., "Az 1868. évi népiskolai törvény végrehajtása: a népiskolai épületek és a hajdúszoboszlói polgári fiúiskola," *Régiókutatás Szemle* Vol. 1, 2019, pp. 47-59.

Moisil, I., *Sciințele Naturale, mijloacele și metoda lor în scolele secundare*, Târgu Jiu, Tipo-Litografia Națională Nicu D. Milosescu, 1897.

—, *Figuri Grănițerești Năsăudene*, Năsăud, Editura Regna, 1937.

Nyhart, K. L., *Modern Nature: The Rise of Biological Perspective in Germany*, Chicago, The University of Chicago, 2009.

Păcurariu, I., "Pământul și omul, Carpații și istoria patriei noastre" in *Raportul al LIII-lea despre gimnaziul superior fundaț. din Naszód-Năsăud pentru anul școlar 1915-16*, Bistrița, Tipografia G. Matheiu, 1915.

Pârvulescu, A., and Boatcă, M., *Creolizing the Modern: Transylvania across Empires*, Ithaca, NY: Cornell University Press, 2022.

Puttkamer, v J., *Schulalltag und nationale integration in Ungarn Slowaken, Rumänen und Siebenbürger Sachsen in der Auseinandersetzung mit der Ungarischen Staatsidee 1867–1914*, München Oldenbourg, 2003.

Popa-Andrei, M., "Legea școlară 38/1868 și efectele sale asupra evoluției învățământului confesional năsăudean" in Gidó, A. et.al. (eds.), *140 de ani de legislație minoritară în Europa Centrală și de Est*, Cluj-Napoca, Editura Institutului pentru Studierea Problemelor Minorităților Naționale: Kriterion, 2010.

Popea, I. "Idealele studentului Român," *Foișoara Telegrafului Român*, Anul II., Nr. 2, 1877, 12-14.

Popu-Câmpeanu, I. and Borza, A., *Grădina școlară a Liceului român unit de Băieți „Sf. Vasile cel Mare" din Blaj*, Blaj, Tipografia Seminarului, 1940.

Salfeld, A., "Grădina scoalei populare" *Foișoara Telegrafului Român*, Anul I, Nr. 3, 1876, 17-18.

Schifirneț, C., "Spiru Haret, Education and School Legislation Reform," *Revista Română de Sociologie*, Anul XXV, Nr. 3-4, 2014, pp. 311-326.

Schwab, E., *The School Garden: Being a Practical Contribution to the Subject of Education*, New York, M.L. Holbrook & CO, 1879.

Simionescu, I., "Cum stăm cu studiul științelor naturale în România," *Noua Revistă Română*, Vol. 1, No. 10,1900, pp. 451-455

—, *Didactica științelor natural*, Iași, Tipografia „Progresul", 1909.

Stanciu, V., *Serbarea arborilor și a păserilor*, Arad, Tiparul tipografiei ort. Române, 1913.

Șotropa, V. and Drăganu, N., *Istoria școalelor năsăudene*, Năsăud-Naszód, Tipografia G. Matheiu, 1913.

Török, B.Z., *Exploring Transylvania: Geographies of Knowledge and Entangled Histories in a Multiethnic Province, 1790*-1918, Leiden: Brill Academic Publishers, 2015.

Ulpianu, S., "Retezatulu peste vară," *Foaia pentru minte, anima și literatură* Vol. 13, 1853, p. 92.

Urechia, N. "Cel dintâi bucegist român," *Printre Hotare*, Anul I, No. 5-6, 1908, pp. 65-66.

V.P., "Studiul sciințelor naturale în România," *Școla română: foia pedagogică și didactică pentru interesele instituteloru de cultură și ale organeloru acestora* Fasc. VIII, Mai, 1879, pp. 353-359.

Vincze, F., *Gönczy Pál polgári népoktatást megalapozó* életművének *a Hajdú-Bihar Megyei* Értéktárba *történő felvételéhez*, Hajdúszoboszló, 2015.