

**FLORA AND FAUNA PROTECTION – THE LEGACY
OF ACADEMICIAN ION TH. SIMIONESCU**

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The prolific activity of academician Ion Th. Simionescu was focused not only on paleontology and geology, but also on natural sciences and nature conservation. An encyclopedic personality, the great savant considered nature preservation as a genuine duty. His holistic argumentation on the necessary protection of flora, fauna and natural habitats was based on important scientific, ethical, historical, economic and socio-cultural aspects. Academician Ion Th. Simionescu permanently promoted the education for nature conservation, for maintaining the ecological balance through a long-term correlation of the principles of nature protection with the economic objectives, and for taking legislative measures that allow their sustainable exploitation. His legacy includes thematic volumes, specialized guides, school textbooks, and numerous popularization articles and conferences with a significant affective impact on the public. All his work, characterized by scientific rigor, was based on direct observations in nature, being presented in an accessible manner for both less educated people and for decision-makers who had the possibility to issue a suitable legislation in this regard.

Keywords: Ion Simionescu, conservation, education, popularization, flora, fauna, natural habitats

We motivate the initiation of this approach, in which we present the contributions of academician Ion Th. Simionescu to the protection of flora and fauna as, in the scientific and popularization works he published, we discover a personality of encyclopedic training, possessing a comprehensive competence in the field of natural sciences. These works provide pertinent arguments regarding the necessity of actions for the protection of nature which, at the beginning of the 20th century, bring together scientific, ethical, historical, economic and socio-cultural aspects.

Initiatives with a reforming role have been also launched by him in the projects for nature protection where, in addition to models of best practices from the West, numerous contributions highlighting the specificity of the natural

environment and the high species richness in the Carpathian-Danubian-Pontic space can be mentioned.

We appreciate that, through these initiatives, Ion Simionescu can be considered a personality with a holistic vision, important also for some current approaches introduced in the field of conservation biology, but also a connoisseur of places of noble wilderness and of numerous traditional settlements in the historical provinces of Romania.

In his works we notice the holistic approaches for nature protection, but also deep meanings of the popular names for plants and animals or related to their presence in the life and traditional customs of the Romanian people.

We appreciate the scientific rigor regarding the taxonomy, ecology and phylogeny of the species that constitute Romania's flora and fauna [54,64,65], with a special predilection for common species, therefore very well-known organisms frequently interfering in man's relationships with nature.

The observations that constitute the scientific source of these contributions were made directly in nature or in the laboratory, and were often illustrated by photographs or expressive drawings, being later gathered in either thematic volumes [43–47,53,54,64–65], specialized guides [50–52,55], school textbooks [49,61], or mentioned in articles and popularization conferences, also delivered on the national radio, with a special psycho-affective impact in education for environmental protection. In this sense, he considers “*botanical excursions... the first steps towards the deep secrets of nature*” [47].

In the reception speech, delivered on the occasion of his acceptance as a titular member of the Romanian Academy, in 1913, he mentioned: “*the duty to science itself, as well as to the country, demands for those who serve science the sacrifice of a part of their activity in the direction of the enlightenment of the crowd*” [42].

With permanent availability manifested for all categories of public, he captivated every time with expressions charged with deep meanings regarding the beauties of nature in our country: “*I tried my best to write as clearly as possible; I deliberately avoided scientific rigidity, although always I relied on the results of rigorous researches*” [52].

The descriptions that bring together the relationships between different categories of living entities can be nowadays considered actual and could be exemplified today in some types of biotic interactions, referred to as “*nature's balance*”, “*nature's police*” or “*nature's temperance*” [64, 65].

These types of interactions are exemplified by some assertions made by the naturalist Charles Darwin, which refer to the ratio between the numbers of cat specimens, respectively of clover seeds: “*in the order of nature, they all have a purpose... The clover is helped in fertilization by some bumblebees, girded with belts like gold. The bumblebee's enemies are mice and rats, which, in turn, fall*

prey to cats... Where there are many cats, there will be few mice. The bumblebees, getting rid of their enemies, multiply more easily, helping the clover to fruit” [65].

Similarly, some of the discussed aspects refer to the reproduction of the European ground squirrel, or of the European hamster, respectively, to the role played by the white stork in reducing pests and to the sparrows that feed on caterpillars - the larvae of some butterflies, but also to slugs, a sort of snail without shell, for whose elimination he recommends making “*a fence with lime dust around the layers of vegetables or bringing some toads, their natural enemies, into the garden. In this way, the police of nature is useful*” [64].

In the same respect, he promotes ideas focused on the biological control of pests, by limiting or even substituting the chemical control methods, which generate pollution and have harmful effects on biodiversity [65].

Several scientific aspects are thoroughly synthesized in specialized volumes [42–48,50–55,58–60,63–65], in which the vast knowledge of botany, zoology, anthropology, ecology or evolutionism of Ion Simionescu is highlighted.

In the descriptions of plant and animal species, he uses scientific concepts regarding their classification and evolution, aspects which have been also approached in the works of many well-known personalities from abroad, among whom mention should be made of: Jean-Baptiste Lamarck (1744–1829), Alfred Brehm (1821–1884), Jean-Henri Fabre (1823–1915), Charles Darwin (1809–1882), Louis Pasteur (1822–1895), or Romanians, as Anastasie Fătu (1816–1886), Ion Borcea (1879–1936), Grigore Antipa (1867–1944), Emil Racoviță (1968–1947), Paul Bujor (1862–1952), Marcel Brândză (1868–1934), Alexandru Borza (1887–1971), Constantin Motaș (1891–1980), Mihai C. Băcescu (1908–1999).

Most of the time, these syntheses include accessible presentations, which also draw attention as to their belletristic style, and valuable considerations regarding the scientific and socio-economic importance of plant and animal species [43–47,53–55,63–65].

Thus, the first edition of the volume entitled *Flora of Romania* (in Romanian – *Flora României*) [54], offers comprehensive data on plant species identification, on the habitats where they can be found, on their importance and manner in which can they be exploited without major disturbances in the living environment.

In these syntheses, plant species are presented in close connection with the habitat they live in, from the meadows of the plains to the mountain areas, in forests, in agricultural crops, respectively on the side of the roads. Aquatic, marsh and salt-fields species are also described, together with plants cultivated for food, for medicinal or simply for ornamental purposes [54].

Special attention was given to the species declared monuments of nature, included in 1930 in the first law on the natural monuments in our country. Among the species included in this protected category, one can note: the rhododendron or the mountain peony (*Rhododendron myrtifolium*) – “*with small flowers like some rose-colored cups ... spreading a pleasant, healthy, life-giving smell of cherry*”, the

carnation of Piatra Craiului mountains (*Dianthus callizonus*) – “one of the beauties of our Carpathians, of which the Alps could be envious”, the edelweiss or queen’s flower (*Leontopodium alpinum*) – “a miracle of nature” and a variety of lotus (*Nymphaea lotus var. thermalis*) – “a relict plant ... not found anywhere in Europe” [54].

The volume offers relevant information on the protection of these species, which should not be collected, especially correct being – in our opinion - the remarks regarding the edelweiss, about which the scientist mentioned that “so much is it picked up, that the plant resists only on hard-to-climb places”, while about the lotus he said: “in its fame lies its destruction. The greed for gain... was almost close to eradicate it” [54]. As early as the first half of the 20th century, he anticipated the negative effects on plant relicts, especially on lotus, through the excessive anthropogenic impact on the habitat where it lives, in the Pețea Lake (Băile 1 Mai, Bihor County). Currently, this species is included in the category of the Romanian flora threatened with extinction [24].

Considerations regarding the ecology and the historical evolution of fauna are supported by assessments related to allogenic species, among which he highlights the presence of the common raccoon dog (*Nyctereutes procyonoides*) or of the jackal (*Canis aureus*), which occupies the ecological niches of indigenous species, or by scientific comparisons based on the discovered fossils, which brings remarkable contributions to the reconstruction of the paleo-fauna of the national territory [65].

The ethical aspects highlight the anthropogenic impact, often with irreversible effects on species or on natural landscapes, especially on forests, were also of special concern for Ion Simionescu: “Save the forests; take care of them, but above all, love them, knowing their beauty, as well as the benefit we can derive from them, forever and ever” [46].

With emotional implications valid even today are the assessments inserted in the work entitled “Young man, know your trees” (in Romanian - *Tinere, cunoaște-ți arborii*, 1938), regarding the condition of the forests, and especially the way they are managed: “where there were woods, today there are hardly any sparse trees left, which show the former greatness... We have become an underforested country” [53].

As to the causes of decline, he warns that “the worst enemy is the man”, so that, for the protection of the conifer species, especially of the larch or the forest lily (*Larix decidua*), currently a protected species, he required the elaboration of a law “to stop their cutting in order to restore the beauty of our mountains and the value they had long ago” [46, 53].

On this line, he highlights the essential role of forests in the stability of natural ecosystems, of hydrographic networks or in the prevention and mitigation of natural hazards, as well as of biodiversity and human health, leaving us a true reminder of a cruel reality characterizing the contemporary society: “Spare the

trees... Once the tree cut down, it must be replaced by another one next to it, so that the curses of those who come after us do not wake up. Plant trees...” [46].

Ion Simionescu also mentions that: “*The merciless cutting of trees and not planting others in their place is one of the improvidences of the present, which will take bitter revenge in the future*” [64]. The consequences can currently be noticed through the harmful way of extracting the wood material from forests, and even from protected natural areas. In the same direction, he noted that young fir trees are cut for the “*Christmas tree*” fashion, and affectedly said: “*How much waste is caused by this, no one realizes*” [64].

With regard to the extinction of some threatened animal species, declared monuments of nature, he considers the hunting activity to be the main cause; in this sense, the aspects concerning the chamois (*Rupicapra rupicapra*) should be noted: “*It is about to disappear from our country, due to excessive hunting, the chamois will become less and less if no protective measures are taken, as in other countries*” [65].

Mention should be also made by his concerns related to the extinction of the lynx (*Lynx lynx*) from its distribution area, its presence becoming increasingly rare in the Southwest of the country, but also in the Buzău Mountains, or in the forests of Bucovina. The number of individuals in lynx populations is threatened especially by merciless hunting: “*It has no other enemy than man, but an enemy that knows how to follow it more patiently and that aims straight at the heart, with the weapon that replaces the fangs. And there is no worse, more persistent enemy than man, especially when someone, whoever is it, beast or other man, attacks the fruit of his labors*” [64].

As to the red deer (*Cervus elaphus*), he presents the morphological differences [6], taken over from the observations of Professor Eugen C. Botezat (1871–1964) from the University of Cernăuți, corresponding member of the Romanian Academy, and highlights the distinctions between the specimens from the Carpathians, which he named “*răgăzan*”, and the ones from the hilly area of the Suceva Plateau or Siret everglades, called “*lidvan*”. He also mentions that these specimens, together with those of roe deer (*Capreolus capreolus*), from which hunting trophies of great value are caught, represent remarkable populations which, nevertheless, are threatened both by natural enemies, bears and wolves that attack in packs, and especially by man: “*he thinned it out little by little, he even eradicated it from many places*” [65].

In the evaluations of the mammals from the Black Sea [65], he highlights the destructive effect of hunting and pollution on both the biotic networks in the marine ecosystem, especially specimens of seals (*Monachus monachus albiventer*), currently considered extinct, and on dolphin species (*Phocaena phocaena*, *Tursiops truncatus*, *Delphinus delphis*).

Special attention is given to aspects highlighting the behavior of some birds with biological or mythological significance. He exemplifies by numerous

descriptions presenting the breeding season of Western capercaillie (*Tetrao urogallus*) or the actions taken by birds to acquire supremacy in the delimitation of their territory: “At dawn, usually when the star light has not gone out... one of the most wonderful manifestations of love can be observed in the living world surrounding us” [65].

Also stated is that, in addition to the natural enemies, the populations are diminished because they have a special value as hunting trophies: “For this reason ... the capercaillie’ race is in great danger” [65].

In the same context, he appreciates that the populations of black grouse (*Lyrurus tetrix*), a species declared monument of nature, are considerably threatened and diminished through hunting, only a small number of specimens persisting in Maramureş Mountains, although, “There were once so many here, that the old people from Dorna Căndrenilor or Poiana Ştampei say that the roosters fought even on the fences of the village” [65].

Special remarks are made about the great bustard (*Otis tarda*), considered a symbol of the steppes of the Romanian Plain and Tisa Plain, or of those from Moldova, including Bessarabia, but also of Dobrogea, known as the most massive flying bird of these places. On one hand, destruction of the habitat along the whole 20th century, and mainly uncontrolled hunting, led to the disappearance of this species at the beginning of the 90s. Occasionally, it can be noticed in agricultural crops from the cross-border area west of the country. A very special and emotional charge can be derived from the following appreciation: “The poor bustards have a big and bad enemy, the glazed frost. When it rains at night and the cold freezes the raindrops, a crust of ice clings to the wings, obstructing them from flying at dawn. Then, they can be easily caught, with the help of a faster dog, and in Dobrogea the peasants kill them with clubs” [64].

Since the first half of the 20th century, observing the numerical reduction of the great bustard, he supported with eloquent arguments the need to protect this species: “We also feel their decrease; with the extension of cultivated fields, the security they need decreases. Their protection is required, because it would be a shame to lose one of the exponents of our birds” [64].

In addition to the descriptions regarding the importance of the hunting fund, we note the assessments that highlight the threats on the diversity of the fish fauna in the mountain area, among which the brown trout (*Salmo trutta fario*) and especially the huchen (*Hucho hucho*), a protected species, threatened with extinction as a result of illegal fishing and of the disregarded legislation: “During the war, however, when judgment and precaution were not really taken into consideration, the huchen was hunted with dynamite. That is the reason why it is now so scarce” [65]. Special attention is also paid to the fluvial fish fauna of the Danube and Black Sea, including sturgeons, with details on some catches considered as true records: “from the great sturgeon which can, rarely, weigh

1,000 kg ..., to the sterlet, which can pull at most 10 kg a piece”, but also to the important quantities of caviar, with prices equivalent to “about 5 bulls before the war” [65].

In the publications describing natural monuments with deep significance for the history of the Romanian people, it can be also noted, in addition to aspects with a certain scientific value, the empathy they show towards these values.

In this sense, the author elucidates on some confusions between aurochs (*Bos primigenius*) and European bison (*Bison bonasus*), aspects even today not always understood, and often requiring additional explanations. He naturally explains the presence of the aurochs associated with the legend of the founding of Moldova, whose protagonist is Dragoș Vodă from Maramureș, the one who would become the first voivode of the principality [65].

The aurochs has disappeared since the Middle Ages, due to excessive hunting, both in the Romanian Principalities and in the rest of Europe. The head of aurochs is the symbol found on the coat of arms of the Principality of Moldova, and it currently complements the insignia on the coat of arms of Romania, but also of the Republic of Moldova.

From the statement about this animal, according to which: “The first time it disappeared entirely was by the 16th century. A ring with voivode's seal found in the tomb of Bogdan III bore as a coat of arms a running aurochs” [65], we retain both the value of an unmistakable symbol for the history of Moldova, and the disregard of ethical principles, causing the irreversible extinction of this species.

The European bison was present in Romania's fauna approximately until the 18th century, and since 1958 it was reintroduced, the genetic material being represented by specimens from the Białowieża Forest (Poland), first in the Slivăț-Hățeg Bison Reserve, and later, and in the “Neagra” Bison Reserve in Bucșani (Dâmbovița county) or, due to an European-funded program, in the “Dragoș-Vodă” Bison Reserve from Vânători–Neamț Natural Park.

The mountain eagle or the golden eagle (*Aquila chrysaetos*) is considered, among birds, the greatest raptor: “the vivacity, strength, agility and always the victory, concentrating in this bird, explain why, in the imagination of our people as in others, the golden eagle holds a very important place, it dominates from the mountain to the delta” [65], bearing the value of a symbol for the coat of arms of the Principalities of Wallachia and Transylvania, and currently of Romania.

In the same context, the common dolphin (*Delphinus delphis*) is mentioned on the coat of arms of Dobrogea [65], in the form of two specimens facing each other, with their heads facing down, against a light blue background.

The author pays special attention to secular trees with symbolic value for the history of the Romanian people, such as the sessile oak (*Quercus petraea*), about which he mentions: “At Țebea on Criș, Avram Iancu rests under Horea's sessile oak” [53].

The need to know and protect nature also results from the assessments on Eminescu's Liden Tree, a tree declared monument of nature, which honors the memory of the peerless poet: "*Eminescu did not just rest in the shade of the linden tree in the Copou Garden from Iasi. The buzzing of the hard-working bees, the so penetrating smell of the flowers from the rigid-looking tree, the whisper of the breeze ..., everything, to a sensitive man, was able to arouse the swarm of thoughts about life and its mysteries, so powerfully present in the production of our great poet*" [53].

In publications that bring together aspects highlighting the economic importance of plant and animal species, also noted are, besides assessments regarding their domestic or industrial uses, recommendations on the rational and long-term exploitation of these resources [46,53,54,63–65].

For example, about the importance of spruce (*Picea abies*), which he appreciates as "*the most important tree among all our trees*", and therefore he considers to be "*the pride of the mountains*" [46, 53], I. Simionescu mentions that it is used from "*matches to ship masts or telegraph poles, from floorboards to clapboards roofs, from writing paper to furniture or packing boxes, man's daily life is linked to spruce and fir wood. Besides many qualities, it also has that of being a wonderful resonant wood, valuable for the manufacture of pianos. Not only its wood is used, but also leaves, bark and roots. The fragrant essence of fir is extracted from the leaf; bark is used in tannery ... On top of that, resin is extracted from it, as well as from other resinous plants*" [53].

These views are also eloquent when he notes the role of the spruce in preventing natural phenomena, such as floods and soil erosion; in this sense, he specifies that: "*It is the tree on which all attention must be directed, not only because it covers most of our mountains, protecting them from the destruction of torrents and, therefore, regulating the course of rivers in the valleys, but also because it is the source of a significant natural wealth, which cannot be dried up through the greed of profit*" [53].

In the numerous expeditions organized in all regions of the country, he was often affected by the manner in which the forest fund was exploited, so that, on every occasion, he mentioned the remarkable economic potential of forests, but also the need of their protection. An eloquent example is that of the larch, about which he wrote: "*In 1928 alone, about 4,000 old larch trees were cut from the Lotru Mountains. There should be a law to stop their cutting*" [53].

Considering that "*Science has given an unsuspected value to wood*", but also that the forests "*give health and help to man, the forests are required to be spared. They remain a never-ending source not only of wealth, whatever the progress of civilization would be*" [46,53], the author highlights the essential role of forest ecosystems, with multiple valences in maintaining the ecological balance, but also the long-term correlation of the principles of forest protection with the economic objectives, by developing legislative measures that only allow their sustainable exploitation.

The socio-cultural valences reside in the numerous popularization works, where known or less known plant and animal species are presented. In these publications, the novel information is presented in a manner accessible to the public, and brings together, in common expressions or very often in metaphors, the names that suggest the behavior of these living organisms, often correlated with moral aspects of people's lives, or with traditional customs.

In these works, there are frequently highlighted, in addition to the ensemble of the main popular epic motifs, numerous original elements that support the need to know and understand the laws of nature, reflected in concepts that support biodiversity conservation through a responsible use of the existing natural resources [16,43–45].

The scientific work related to the protection of plant and animal species includes books or treatises, but especially popularization articles, published in the magazines and newspapers of the time [6]. In this sense, special mention should be made of his concern for science popularization, in his position of founding member in the *Vasile Adamachi Scientific Journal*, respectively *Natura* journal, of whose issuing he took care of in the period 1940–1944.

From the thoughts expressed on the occasion of the New Year 1941, published in the first number of the *Natura* journal [56], we note the following assessments: “*Like its younger sister: the Scientific Journal V. Adamachi from Iași, which addresses to the elements with a higher scientific education, the Natura journal will seek, as much as possible, not only to draw attention to the general scientific problems of the day, but especially to the Romanian publications and to the results obtained through the silent but persevering work of the servants of Romanian science*” [56].

Special significance in the education of young people for nature conservation bear, above all, their teachers; in this sense, we mention the confessions he published in 1942, in number 5 of *Natura*: “*I was shown the way to work and the passion for nature by a teacher from my childhood. If teachers would be convinced how great is their power of influence on shaping a child's soul, great miracles could be performed in our schools*” [57].

We also highlight the contributions from the series of brochures entitled *Useful knowledge*, published in four series: A. *Science for all*, B. *Advices for households*, C. *From the wide world* and D. *Applied science*, at Cartea Românească Publishing House [63], an institution he led – as president of the Board of directors – since its foundation.

Also, in the series *Science for All*, numerous articles were published on subjects from the field of natural sciences, among which the biological sciences stand out. In the first issue of this series, aspects related to the primitive man [48] were included, supplemented with details about the Paleolithic and Neolithic man [58–60]. Thus, besides the presentation of the most important characteristics of the living world in *Principles of biology* (in Romanian – *Principii de biologie*, 1939),

there are presented scientific arguments, accepted at that time, regarding the origin and evolution of man, stating that: “*the origin of humans from other animals does not mean an involution. On the contrary, man appears as the crowning of a long evolution of the rest of the animal world, capable of evolving continuously, subjected to the same biological law as all other beings*” [55].

In the same context is to be integrated the activity, started in 1902, of developing school textbooks on botany and zoology, as well as human anatomy and physiology books intended for students from secondary and higher courses. Among the textbooks elaborated for the higher education level, we mention: Botany, higher education course (manual reaching its 4th edition in 1941), Zoology, higher education course (10th edition in 1941), General Biology, higher course (8th edition in 1941) or Lessons of Human Anatomy and Physiology, (4th edition in 1943) published together with Professor Teodor A. Bădărău (1872–1958).

As an expert in all problems associated with Romanian education, Ion Simionescu was constantly concerned with the improvement and adaptation of school programs to the real needs of the society, both from the positions held within numerous commissions of the education ministry or as a deputy in the Romanian Parliament.

In this regard, he appreciates that: “*Teaching of lessons in school should no longer be done according to the common sense of the teacher. He needs, absolutely necessary, some general management principles, and above all a specialized methodical training, so that his work in any field be as fruitful as possible in the education and instruction of students*” [62]. In order to respond to these needs, he coauthored textbooks on the teaching methodology of natural sciences, insisting on the role and duties of teachers in both school and society.

His concerns for the as accessible as possible assimilation of scientific novelties, and for their transfer towards the members of the society, especially to social categories with limited resources, has become a permanent objective of his, registering remarkable results, equally appreciated [6,21,25–27,30,31,41,69–71] by his contemporaries, academicians: Dimitrie Gusti (1880–1955), Traian Săvulescu (1889–1963), Gheorghe Macovei (1880–1969), Liviu Ionesi (1925–2006), professors: Ion S. Atanasiu (1892–1949), Ioan Gh. Botez (1892–1953), Mihai David (1886–1954), Miltiade Filipescu (1901–1993), but also by the generations that followed and were active in the field of natural sciences, among which we mention professors Ioan Gugiuman (1969, 1974), Ioan Donisă (1984), Mihai Brânzilă (2010), Constantin Grasu (2010), Bica Ionesi (2010), Leonard Olaru (2010), Ion Turculeț (2007), etc.

The personality of academician Ion Simionescu was evoked in numerous volumes – BRÂNZILĂ (ed.), 2010; DONISĂ, 2014; ERHAN et APOSTOAE, 2010; IONESI, 2007; MACAROVICI, 1960; MACOVEI, 1941; MAFTEI, 1972; MĂRGHITAN et MITREA, 2008; NASTASĂ, 2006; PREDESCU, 1999; TURCULEȚ I., 1986; TURCULEȚ I. et BRÂNZILĂ, 2012; TURCULEȚ M,

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In conclusion, we appreciate that, through all these contributions, the great savant permanently supports the balance between man and nature, inviting each of us to know and unconditionally value all these gifts and the ancient places, which also offer to the current and future generations, in addition to uniqueness, unparalleled heritage values.

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