

BIOPOLICY IN ROMANIA: HISTORY AND PRESENT STATE

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Bio-policy, as any other human attitude, is based upon knowledge, tradition and the level of education. It is a way to tap the philosophy of existence itself. The attitude regarding nature is not necessarily related to the degree of social development. Since long ago, negligence has been a peculiarity of countries with a high level of socio-economic status and equally peculiar to poor or undeveloped ones. When we are talking about bio-policy we want to designate people's behaviour during their struggle to develop agriculture and industry, when they want to use resources or enjoy natural landscapes.

Sciences, especially branches of biology, had, and still have, the duty to educate and make humanity aware that the Earth, with all it contains, does not belong to us. It was only borrowed from future generations, and we have to return it.

Bio-policy in Romania, with regard to one of its most important components, ecology, has a very old history going hand-in-hand with the process of the evolutionary theory of development in the world.

One man who implemented Braun-Blanquet's concepts and methodology, contributing to the extension of evolutionary theory towards the understanding of the interrelations existing between plants and soil was Borza (1924). Simultaneously, a great number of zoologists began to study the dependencies of animals on the environment. Their results contributed not only to the completion of the evolutionary theory, but also to the development of new branches such as autecology, synecology, etc.

The forerunner of Romanian ecology is considered to be Emil Racovita (1868-1947), Lacaze Duthier's pupil and co-worker. For 20 years as the deputy director to the Arago Marine Laboratory-Baniuls sur Mer, he left behind a monumental work, valued all over the world. In his paper 'Evolution and its Problems' (1929), Racovita treated the fragility of ecological balance when it is confronted with human activities. He wrote: "Nowadays the natural biological equilibrium is just about to break down due to the intense human activities, with consequences that cannot be stopped by self-regulation..."

Another enlightened mind, considered the true father of Romanian ecology, was Grigore Antipa (1867-1944), Haeckel's student and co-worker. As soon as he finished his education with Haeckel, he implemented the ecological criteria to hydrobiology. Not only for Romanian, but also for European biology, he originally discovered the laws governing the self-regulation process; using the example of the Danube River, he explained the interrelation between environmental factors and aquatic productivity. "...fish productivity is directly dependent on duration and surface of inundation...", in other words, hydrotechnological works have to be restricted and must be thoughtfully implemented

. The quintessence of his concepts is to be found in the paper 'The General Organization of Collective Life of Organisms and the Mechanism of Biosphere Production' (1935). The ideas of biocenosis and its determining position regarding the matter and energy flux, as well as the role of qualitative and quantitative composition of each species in biocenosis for productivity, were brilliantly formulated. We must not forget that all these ideas were developed at a time when the 'ecosystem' did not exist either as a branch of study or as a notion. All these new principles found an audience as soon as they were issued, because the 'soil' was a good one: the Romanian people had a special feeling for nature. It was at that time when the struggle to protect natural equilibrium was pleaded by Racovita in parliamentary sessions.

Early in 1921, the Mountaineers Brotherhood was founded. The first Romanian association was organized by Racovita and was designated "...to gather all powers of mountain lovers...who are asked to protect both mountains and forests against devastation...". One of the ways to accomplish an ideal like this was to obtain recommendations from the most appropriate experts regarding the necessary protective measures and rational exploitation.

In April 1928, Professor Popovici-Biznosanu, the president of the newly founded 'Romanian Naturalists Society', organized the first Congress of this forum, where the necessity of legislation to care for all nature was debated. Not long after, in 1930, the Commission of Natural Monuments was formed. In 1935, the legislature promulgated the declaration of one of the biggest Romanian natural reservations in the Retezat Mountains.

The first issue of a scientific review entitled 'Protection of Nature', the editorial of the Commission of Natural Monuments, was in 1957. Many top scientists contributed to an accurate presentation of natural landscapes, historical places, natural monuments, endemic species, or endangered species, etc. The content of all articles was accessible to educated people of all levels.

Complex scientific studies in ecology and protection were performed in a large network of laboratories: the Institute for Plant Protection; the

Institute for Studies and Forest Planning; agencies for Water Protection; the Romanian

Marine Research Institute; academic laboratories and the biology departments of universities, etc.

The sciences of ecology and environmental protection were introduced in 1961 as compulsory disciplines in all higher education schools in Romania, since general biology had been taught in secondary schools for the past forty years.

In the 1960s a Romanian manual of ecology¹ was published. Shortly thereafter, the publication of other, more modern handbooks followed, for example: Botnariuc;² Botnariuc & Vadineanu;³ Simionescu;⁴ and Stugren.⁵ All of these publications opened new horizons in environmental knowledge.

The existence of a genuine and valuable experience, a great volume of work and scientific results was not enough to stop the rapid decline to negligence and arrogance regarding nature, the general tendency of most of the inhabitants of our planet during the last 20 years.

An increase of all these behaviors in Romania was particularly due to the closed economy that practiced a very unwise policy of nature management, guided by the idea that more and more quantity would compensate for quality. During the mad race for industrialization, chemical treatments in agriculture, the very high rate of urbanization, and the obsession endeavors to repay loans to foreign banks, made everything convulse nature and people.

During the harvest campaign organized every year, compulsory daily work for more than two months exhausted people and caused them to hate rather than to love this human contribution to production on the land. People of all ages including pupils and students were asked to work in agriculture. Thus, learning time for the students was reduced by two months a year, and therefore the educational program was severely condensed.

Ecological and biological education was diminished as these disciplines were pushed out by mathematics and physics, both extremely important in developing a competitive level of future experts in different modern technologies.

The degradation of the environment was becoming extreme. There were many scientists, engineers, teachers, and common people who demanded that measures be taken against pollution, but little was done, as the ex-politicians had no interests or concern in these areas, but only in economic policies leading to results in profits.

The metallurgical industry generated ecological disasters such as: Copsa Mica, Baia Mare, and Zlatna. About 500,000 hectares within the Zlatna area were heavily polluted by sulfur dioxide, lead, and a variety of powders, and their concentrations were found to be two to three times higher than permissible.

The effect of all these chemical compounds covered an area of more than 90 million square meters of forests as well as the surrounding area, including human settlements. These seriously affected the mortality rate of vertebrates and the disease rate in humans. Within the polluted area, the photosynthetic pigments of leaves were observed to have reduced their level by 37-58% in comparison with the controlled level.⁶

In an area highly polluted by sulfur dioxide, a modification of the leaf perspiration process occurred. That means, not only could the forest metabolism be influenced but also its contribution to water circulation was affected.⁷

The acid rains on the Western slopes of the Zarand Mountains, particularly due to atmospheric sulfur dioxide and nitrogen oxides, have been noticed since 1985. They affected the leaves, growing tip or all foliage of many plants, especially that of the oak and vineyard.⁸

As a result of the rapacious interventions on forests during the last century in the Northern part of Romania, forests changed their composition and vertical structure. A serious decrease in the proportion of fir trees from 56 to 26 percent in the Marginea forest and from 20 to 12 in Argel forest was observed.⁹

The consequences of forests depletion are very important: floods in large deforested areas, soil erosion, land slides, all with serious implications to agriculture. Last but not least, the fact that the negative human attitude towards nature is collapsing¹⁰ should be mentioned.

Both experts and forest laborers became deeply involved in silviculture and nature protection, fought against abuses and, even though in many cases they failed, in some they succeeded. An example is the promulgation of Law no. 9/1973, that declared 2500 hectares of beech forest in the Semenic Mountains, with an average age of 145-350 years, a natural preserve. During 1985, another area of 1000 hectares were added to this reservation.¹¹ Here we should also recall the initiatives to protect soil against frost, drought, deflation, erosion, etc., by kilometers of forest strips practiced in the main districts.

Some sort of chemical compounds as a residue from dyestuff industries e.g. aromatic amines (aniline, 4-aminodiphenil, benzidine) or azoic

substances (paradimethyl-amino-benzene, hydrazine) as well as dicloromethylene-ether, that are the result of ion exchanges in manufacturing, are supposed to carry cancer risks. Aromatic amines produce urinary bladder cancer since diclormethilen-ether was found to be involved in a form of bronchial cancer. All these compounds were found in receiving rivers.

In a study of 1200 children within the Baia Mare area, one of the most polluted, a regression in mental capabilities was observed.¹²

Nitrate pollution of underground water in the Arad district caused methemoglobinoury to a number of babies still being breastfed, when the concentration of pollutants exceeded 10 mg/l. During 1982-1985, from a total of 870 samples, nitrates were present in 70% and ranged between 200-950 mg/l in 40% of samples.¹³ Rivers, lakes and the Black Sea are also affected by pollution.

The Black Sea has the special status of being semi-enclosed. There exists a strong dependency on the fate of this basin and the surrounding 'contributory rivers.' The capacity of tributary rivers was modified. Until 1969, rivers running into the North-West corner of the Black Sea, for example, supplied between 328 and 350 cubic kilometers of water.¹⁴ After 1969, hydrotechnical works as well as the development of agriculture has not only diminished rivers inflow to the sea, but completely changed its quality.

Between sea and estuaries, or sea and delta, many dams have been interposed. The reservoirs thus created have modified their own chemical composition, and indeed influenced the sea water chemistry and biology. The Danube River itself carries about 21 tons of N-NH₄, as well as: (all measurements in 000s of tons) 30.040 to 186.34 tons N-NO₃; 4078 N-NO₂; 5.970 to 21.850 P-PO₄; 229.370-477.620 Si-SiO₃ each year.¹⁵⁻¹⁷ In front of the Danube delta, sturgeon fishing declined severely: in 1971-1974, quantities caught only by passive fishing reached 141 to 203 tons, but within 1983-1990 passive fishing as well as trawling together totalled from 50 tons in 1983 down to 32 tons in 1987, 18 tons in 1988 and only 4 tons in 1990. The stock of sturgeon into the Black Sea regressed as well (Marinescu et Butoi, personal correspondance). A local eutrophication/pollution effect is produced by industrial and domestic outputs: the most important one annually discharges 9453 tons of P-PO₄, and also 7264 tons fluorides; 45,265 tons of sulfates, and 4333,690 tons of suspended matter. The intensification of sea navigation caused oil and organic accidental pollution and introduced new species into the ecosystem.

The trawling for sprat resumed in 1970 in spite of the bad experience from its practice at the beginning of this century. It entailed damages on the benthic communities and facilitated the accumulation of mineral and organic sediment deposit in the water column. All these human interventions broke the equilibrium in the marine ecosystem: heavy blooms of phytoplankton, anoxia, disturbances of zooplankton, zoobenthos and the reduction of the number of fish species,¹⁸⁻²⁰ or gave to some species most of them economically unimportant the opportunity to develop into large quantities.^{21,22} Pollution and all abuses to nature are bad. Even in a country with a tradition in ecology and protection, the present situation is alarming. How must it be in other parts of our planet? Ecology and peace must be imposed with equal force and the right education to enable humans to understand the lessons of history as well as the power of self discovery.

In Romania, a new strategy has been adopted. A return to previous experiences in protection and love for nature by a true ecological restitution and also development of an ecological prophylaxis. In 1990, a Ministry of the Environment was founded. Full authority was invested to enforce new legislation. Many scientific programs have been started in association with organizations such as: the Common Programme of Black Sea Hydro-Chemistry; the Danube River Common Programme; the Bucharest Convention of Black Sea Riparian Countries; and the PHARE, PNUD, and FAO. Ecological parties, Youth Ecological Organizations and Clubs have also been established.

New initiatives to protect nature have been undertaken: one of them includes the Danube delta among Biosphere Reservations. The very first measure to stop poaching in this beautiful and economically important area was the sending of specially trained troops to guard it. Ecological education has been re-organized. Biology and ecology have regained their place in the education program and ecological universities were formed.

One of the most valuable initiatives was accomplished by the Forest High School from Timisoara, which introduced not only special courses, but ecological camps as well. In April 1992, an International Conference on the correct way to educate children in the spirit of love for nature was held in Timisoara. The conference was sponsored by our Ministries of Education and Environment, as well as many international organizations for children and environmental protection. During this prestigious manifestation, the National Center for Ecological Education was inaugurated.

How many other things should be done? For how long must these initiatives to stop the destruction of land, orchards, meadows, forests and waters live parallel to our greed? Nothing in the world can be possessed, only rationally used. Education must be improved not only for the children, but also for adults, and this is what the International University for the Bio-Environment has to complete. One last thought, "noesis noesios": to think our thoughts and to best implement our best thought thoughts.

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